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Our Tools are made of the best Sheffield Steel and are Warranted.

They are Unequalled in Quality and Finish.

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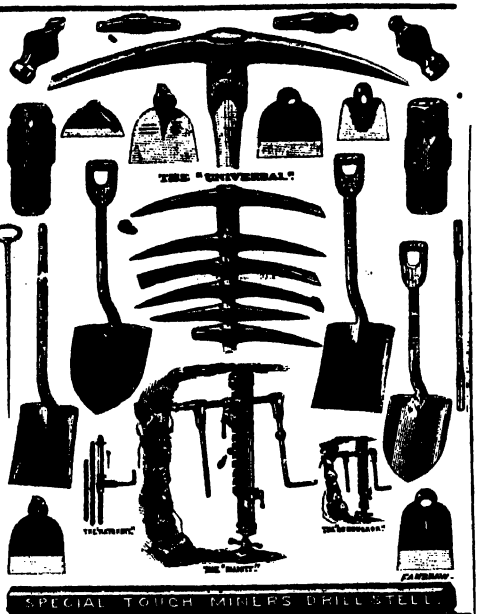
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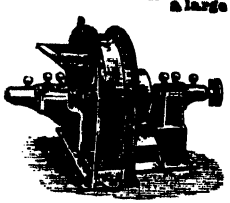


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THE "DEVIL" DISINTEGRATOR & BONE GRINDER

Is the BEST MACHINE

For Grinding almost any material to moderately fine or coarse powders, giving at the same time a large output.



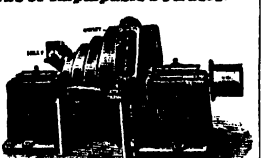
The most important *competitive trials* of Disintegrators ever *held*, took place at the ROYAL AGRICULTURAL SOCIETY OF ENGLAND SHOW, held at Plymouth, June, 1890, when the "DEVIL" was declared to be the BEST MACHINE, and was awarded the FIRST PRIZE and the SOCIETY'S MEDAL.

There were EIGHT ENTRIES for this Competition from the best makers of this class of Machinery.

It is Cheap, Simple in Construction, and not liable to get out of repair. The Grinding Rings, which are the only wearing parts, can be replaced by a labourer, without fitting, at slight cost.

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Is the Best Machine for Reducing Friable, Fibrous, or Moist Materials to fine or Impalpable Powders.



WHEAT, MAIZE, RICE, BARLEY, and other Grain may be reduced to the fineness and softness of wheat flour.

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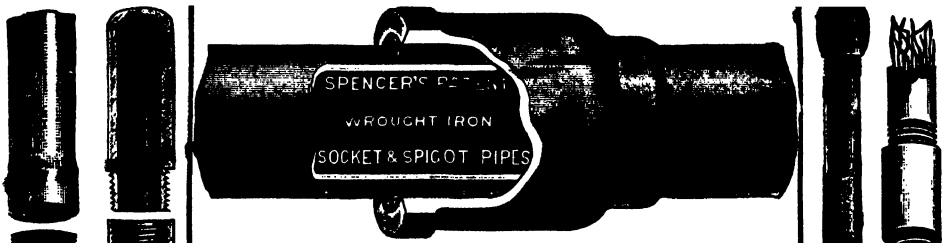
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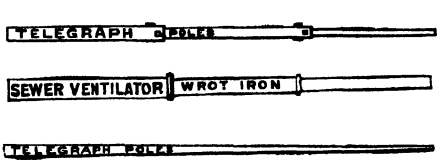
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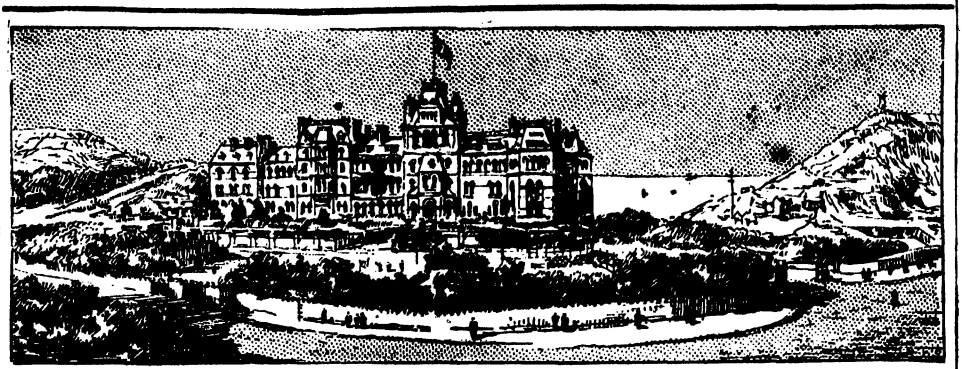






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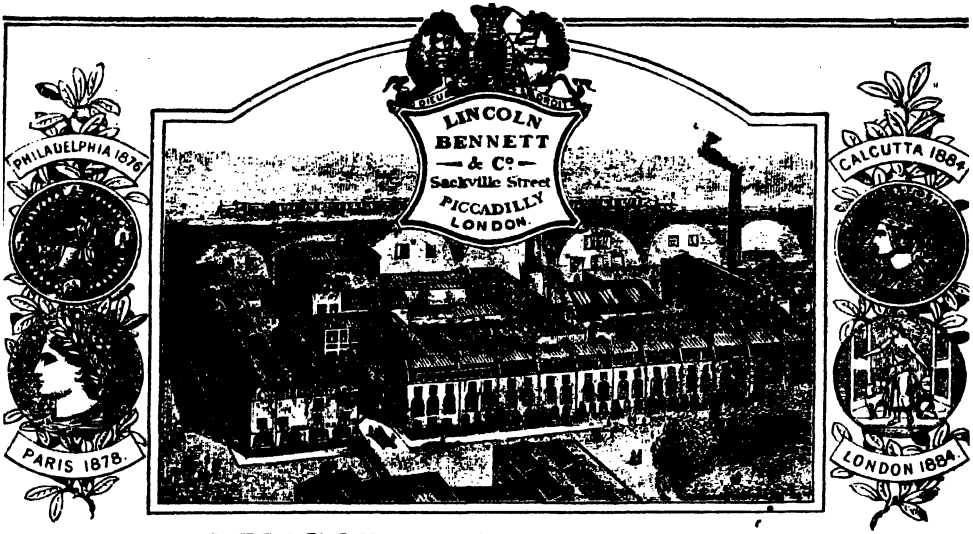
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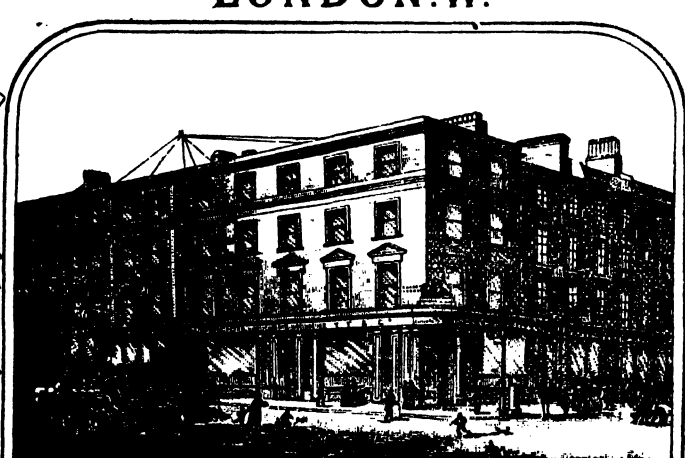
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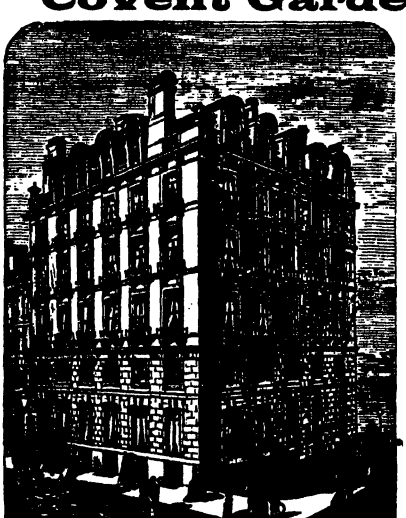
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NINETY YEARS' RECORD.

THE records of the Society for the first 38 years of its existence are, unfortunately, not available; but the following summary of the Accounts for the **Ninety Years** ending 31st December, 1890, will illustrate, better than words can explain, the extent of the success achieved.

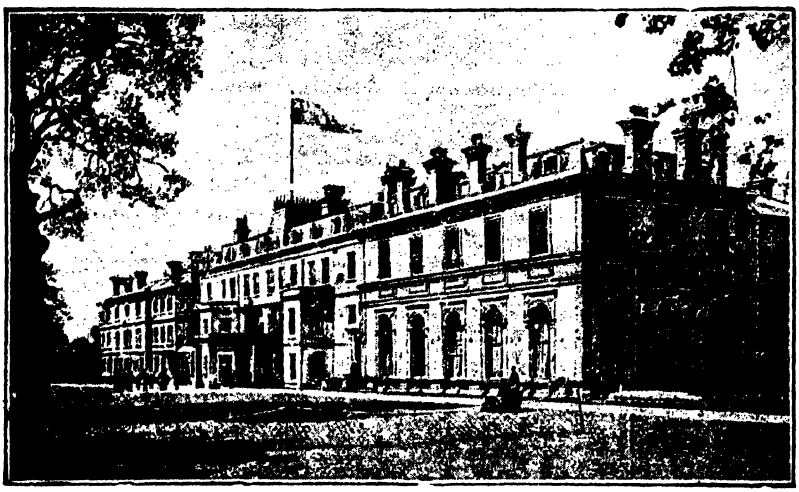
During the Ninety Years referred to,

The Premiums received amounted to	**£24,456,967**
And the Society Paid	
In Claims under its Policies	**£19,224,346**
In Bonuses	**21,607,377**
As Surrender Values	**2,093,642**
In Annuities	**148,770**
Total Payments .. .	**£43,074,135**
Funds in hand 31st December, 1890	**£4,222,241**

The above figures show that, on the average, for every **£1,000** Policy that became a claim, the Society paid, in amount assured and bonus, **£2,124**; and that the members or their relatives, on the average, received a return of **176** per cent. of the Premiums paid.

THE EQUITABLE SOCIETY has always practised the strictest economy in the conduct of its business, and to this fact is largely due the remarkable results above recorded. It has no shareholders to participate in the profits, and has NEVER EMPLOYED AGENTS, or paid Commission. The total expenses of management, as shown in the Accounts for the year 1893, amount to only 7·1 per cent. on the total premium income, or 3·7 per cent. on the Total Revenue.

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SOUTH KENSINGTON HOTEL.



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(JAS BAILEY, MANAGING DIRECTOR.)

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1889
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FIFTH EDITION.—*Re-written.*

ORIENT LINE GUIDE

CHAPTERS FOR TRAVELLERS BY SEA AND BY LAND

FULLY ILLUSTRATED
WITH
BLACK AND WHITE ENGRAVINGS, COLOURED PLATES, MAPS, AND PLANS.

EDITED FOR THE MANAGERS OF THE LINE
BY
W. J. LOFTIE, B.A., F.S.A.,
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E.C.

PREFACE TO THE FIFTH EDITION.

THE Managers commissioned the composition of the First Edition of this work with the desire of placing before the public particulars of the route of the Orient Line, and of pointing out, as in a Guide Book, such information as to season, voyage, and destination as may prove most useful to the intending passenger.

The appreciation of the *Orient Guide* by the reading public has necessitated, from time to time, the issue of fresh editions, reaching down to this, the Fifth Edition.

Considerable alterations have been made in preparing this edition for the Press. The opening chapter is chiefly from the pen of Sir Wemyss Reid, who has had considerable experience as a sea voyager. The chapter on Germany, by Mrs. Fawcett, has been omitted, and most of that on Italy. Of the chapter on Greece, by Mr. W. B. Richmond, A.R.A., only that part has been retained which describes Athens. The description of a visit to the Holy Land has been re-written, and brought up to date, from information kindly supplied by the Managers of the Palestine Exploration Fund. Some notes on Ceylon have been written for the *Guide* by a native Singalese lady. Commander Hull, R.N., has revised and condensed his chapters on the Stars, on Seamanship, and on Navigation, and has expanded his account of the Mariner's Compass. The Rev. C. H. Middleton-Wake has revised his notes on Nature at Sea.

The chapter on Universal Time by Mr. J. Norman Lockyer, C.B., F.R.S., has been shortened; Mr. H. E. Watts has revised his notes on the Australian Colonies, to which an account of Australian Zoology has been appended; while a new chapter dealing with a recent visit to the Australian Colonies, by Mr. Matthew Macfie, who formerly resided there, has been added.

There is a change in the method of illustration, and an attractive feature has been added in the full-page reproductions of water-colour drawings of ships by W. L. Wyllie, A.R.A.

W. J. LOFTIE.

September, 1894.

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* These are fac-simile reproductions of water-colour drawings by W. L WYLLIE, A.R.A.

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Gregory, Geo., & Co.	London	(*Stock Brokers*)	380
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British Australasian and New Zealand Mail	377
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Symons, Jno., & Co. Limited	Totnes	(*Devonshire Cyder*)	346
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List of Standard Books on Australia and Egypt:—

AUSTRALIA.

Early Voyages to Terra Australia. Edited by R. H. Major, Hakluyt Soc. Pub., vol. xxv. 1859.
Dampier's Account of New Holland. Pinkerton, vol. xi.
Geological Observations together with Notices on the Geology of Australia, by C. Darwin. 1844.
Australian Gatherings of a Naturalist, by G. Bennett. 1860.
Catalogue of Australian Mammals, by D. Ogilvie. 1892.
Catalogue of Marsupialia, by Oldfield Thomas. 1888.
Parrots in Captivity, by W. T. Greene. 3 vols. 1887.
Catalogue of Parrots in the British Museum, by Count Salvadori. 1891.
Australian (Tropical) Handbook, by G. W. Earle. 1863.
Victoria's Gold and Mineral Districts, by Smyth. 1869.
Emigrants' Guide to Australia, by J. Baird. 1871.
Australian Handbook, Almanac, and Shippers' Directory, Gordon's. 1872.
My Wife and I in Queensland, by C. H. Eden. 1872.
Australia and New Zealand, by Anthony Trollope. 1873.
Dominion of Australia, by W. H. L. Rankin. 1873.
Historical and Statistical Account of New South Wales, by J. D. Lang. (4th Edition.) 1874.
Across the Western Interior of Australia, by Colonel Egerton-Warburton. 1875.
Sketches of Australian Life and Scenery, by a Thirty Years' Resident. 1876.
South Australia, its History, Resources, and Productions, by W. Harcus. 1876.
The Fifth Continent, by C. H. Eden. 1877.
Australian Aborigines, Language, &c., by J. Dawson. 1881.
Australian Graziers' Guide, Silver's. 1879 and 1881.
Australia's Heroes, by C. H. Eden. (4th Edition.) 1882.
History of Australia, 1787-1882, by James Allen. 1882.
Official History of New South Wales. 1883.
Australian Handbook, by Messrs. Gordon & Gotch. Yearly.
Australasia, by A. R. Wallace, with Ethnological Appendix by A. H. Keane. (4th Edition.) 1884.
Advance Australia, by Hon. Harold Finch-Hatton. 1885.
Oceana, by James A. Froude. 1885.
Handbooks of the several Colonies issued in connection with the Colonial and Indian Exhibition. 1886.
Official Year Book and Directory of Australia, Edited by Edward Greville. Yearly, from 1884.
Through the British Empire, by Baron von Hübner. 1886.
Statesman's Year Book. 1887.
Greater Britain, by Sir Chas. W. Dilke. 1866-67.
Australasia, Atlas, by Bartholomew. 1890.

Picturesque Australia, by Cassell. 1890.
History of New South Wales, by G. B. Barton. 1890.
Discovery of Australia, with Maps, by A. F. Calvert. 1893.
Australasia, Handy Guide, by Levey. 1891.
Guide to Health Resorts in Australia, by L. Bruck. 1888.
Gold Metallurgy, by M. Eissler. 1891.
Rural Economy and Agriculture of Australia and New Zealand, by Robert Wallace. 1891.
Colonial Year Book. 1891.
Polynesian Mythology, by Sir G. Grey. 1885.
Ancient History of the Maori, by J. White. 1889.
Old New Zealand, by a Pakeha Maori. 1887.
Captain Cook's Three Voyages round the World, Edited by Lieut. C. R. Low. 1892.
Notes on New Zealand, by W. E. Swanton. 1892.
New Zealand Guide, by Sweetser. 1891.

EGYPT.

Murray's Handbook, Egypt and Sinai. 2 vols. 1891.
Bædecker's Lower Egypt and Sinai. 1878.
Bædecker's Upper Egypt and Nubia. 1891.
The Egypt of the Past, by Sir Erasmus Wilson. (2nd Edition.) 1882.
Egyptian Sepulchres and Syrian Shrines, by Viscountess Strangford. 1874.
History of Egypt, by Dr. Brugsch. 2 vols. 1880.
The Ancient Egyptians, by Sir Gardiner Wilkinson. 3 vols. 1878.
Lane's Modern Egyptians. 2 vols. 1871.
A Thousand Miles up the Nile, by Amelia B. Edwards. 1877.
A Ride in Egypt, by W. J. Loftie. 1879.
Letters from Egypt, by Lady Duff Gordon. 1866, 1875.
Eöthen, by A. W. Kinglake.
Eastern Life, by Harriet Martineau. 1875.
Maspero's Egyptian Archæology. 1887.
Pharaohs, Fellahs, and Explorers, by Amelia B. Edwards. 1891.
Pyramids and Temples of Gizeh, by Dr. Flinders Petrie. 1884.
The Mummy, by Dr. Wallis-Budge. 1893.

ORIENT LINE

OF

ROYAL MAIL STEAMSHIPS

BETWEEN

LONDON AND AUSTRALIA.

Managers: { F. GREEN & CO. / ANDERSON, ANDERSON & CO. } Fenchurch Avenue, London, E.C.

For Freight or Passage apply to the latter Firm, or to any of the Agents. *See Page xlix.*

INFORMATION FOR PASSENGERS.

N.B.—The following information is published as correct at the time of the issue of this Guide, but is not to be assumed to be correct at any future date, unless confirmed by the Managers or any of the Agents of the Line, to whom application should be made for full particulars of Fares and Regulations before Booking.

PORTS OF CALL.—The Steamships of the Line call regularly at Plymouth, Gibraltar, Naples, Port Said, Ismailia (for Cairo), Suez, Colombo, Albany, Adelaide, Melbourne, and Sydney.

FARES between England and the Ports of call of the Line in Australia each way range from about £16 . 16 . 0 upwards in the 3rd class, £35 upwards in the 2nd class, and from £60 upwards in the 1st class, according in each case to the accommodation required.

THROUGH TICKETS are issued to and from all Ports in Australia, Tasmania, and New Zealand; also Single and Tourist Tickets between London or Australia and Gibraltar, Naples, Port Said, Ismailia (for Cairo), Suez, and Colombo, and between all Ports touched at by the Steamers, except between London and Plymouth.

First and Second Saloon Passengers between London and Australia have the option of breaking the journey at any Port of call between Plymouth and Albany, or *vice versâ*, and resuming it within three months by a later Steamer of the Line having room.

RETURN TICKETS AND ROUND THE WORLD TICKETS are issued at reduced rates.

THROUGH TICKETS FOR COLONIAL PORTS, AT WHICH THE STEAMERS OF THE LINE DO NOT CALL.—Passengers booked through for ports other than those at which the Steamers of the Line call, may remain on Board the Orient Steamer without extra charge until the departure of the first branch Steamer, should the Orient Steamer remain in port so long; but the Orient Line will not be answerable for any hotel expenses or railway fares, etc., which may be incurred. Passengers proceeding by the first Intercolonial Steamer for their destination can have their baggage transferred free of charge, but at their own risk.

BOOKING.—A deposit of half the passage money must be paid at the time of securing a berth, and the balance at least three days before embarkation. The deposit will be forfeited in the event of the Passenger not joining the ship.

The full name and destination of the Passenger should be forwarded when application is made for a ticket.

EMBARKATION.—TILBURY.—For the convenience of Passengers embarking at Tilbury, a Special Train leaves the Fenchurch Street Station of the London, Tilbury, and Southend Railway on the day of embarkation, and a Steam Tender meets the Train at Tilbury to convey Passengers to the Orient Line Steamer in the River. Tickets for the Special Train and Tender can be obtained at Fenchurch Street Station.

PLYMOUTH.—Passengers are embarked here by Steam Tender from Millbay Pier on the date advertised for leaving Plymouth. Reduced fares from London, Reading, Swindon, Salisbury, Bristol, and Exeter to Plymouth are charged to Passengers upon presentation to the Booking Clerks at the Station, of Vouchers, to be obtained of ANDERSON, ANDERSON & Co. Friends accompanying Passengers to the Steamer can also obtain Return Tickets at single fares, upon producing to the Booking Clerk a Voucher procurable from ANDERSON, ANDERSON & Co. The Agents at Plymouth are Messrs. J. PENGELLY & Co., Duke of Cornwall Buildings.

NAPLES.—Passengers can join the Steamer here nine days later than in London. Railway Tickets from London to Naples can be purchased with the

Steamer Ticket if desired. Fares £11 . 4 . 3 1st class, and £7 . 16 . 9 2nd class. Passengers travelling overland to Naples can leave London on Friday following the Steamer's departure from Tilbury, by the Train leaving Charing Cross Station at 10 a.m., *viâ* Folkestone and Boulogne, due at Naples at 1.26 p.m. on Sunday, and Passengers can embark during the same afternoon. The Agents at Naples are Messrs. HOLME & Co., 2, Via Flavio Gioja.

HOMEWARD VOYAGE.—EMBARKATION AT SYDNEY.—The Steamers leave the Company's Wharf, Circular Quay, at noon. Passengers are requested to be on board not later than 11.30 a.m.

EMBARKATION AT MELBOURNE.—A Special Train leaves Flinders Street Railway Station on day of sailing, and will convey Passengers alongside the Steamer at the Port Melbourne Railway Pier, at ordinary rates.

EMBARKATION AT ADELAIDE.—Steam Tenders ply from the Largs Pier during Steamer's stay at Semaphore anchorage, to convey Passengers and their luggage to the Steamer, free of charge, passes for which may be obtained at Office of Agents.

RAILWAY CONNECTIONS. — On application, Certificates will be issued to Passengers who wish to join the Steamer at Melbourne or Adelaide, or to disembark there and travel by train, to enable them to obtain Tickets at the following reduced rates :—

FROM SYDNEY—
or vice versâ.

TO MELBOURNE.			TO ADELAIDE.		
1st class ...	£2 14	0	1st class ...	£5 4	0
2nd class ...	2 0	6	2nd class ...	3 10	6

FROM MELBOURNE TO ADELAIDE—
or vice versâ.

1st class ...	£2 10	0	2nd class ...	£1 10	0

NAPLES.—Passengers deciding to land here should give notice to the Purser of their intention to do so before leaving Suez.

PLYMOUTH.—A Steam Tender meets each Steamer on arrival, and Railway Tickets to London at reduced rates are issued to Passengers by the Great Western Railway Company, and London and South Western Railway Company, or these can be purchased from the Purser on Board. Fares—1st class, £1 . 12 . 6; 2nd class, £1 . 2 . 6; 3rd class, £0 . 17 . 6. Children under 12 years, Half Fare. The above Fares cover all expenses for Dock Tolls, Landing Charges, &c., from the Steamer to London.

When the number of Passengers landing at Plymouth is sufficiently large, a Special Train will be put on for the convenience of Passengers to London and intermediate Stations. Passengers are recommended to give early notice to the Purser of their intention to land at Plymouth.

BAGGAGE.—First Class Passengers will be allowed 40 cubic feet each adult; Second Class 20 feet; Third Class 15 feet. Freight will be charged for excess. Every package must have the Passenger's name and destination distinctly painted, or otherwise permanently marked on it, with the words "*Wanted on the Voyage*," or "*Not Wanted on the Voyage*." Boxes for the Cabin should be marked "*Cabin*," and should not exceed 2 feet 8 inches long, 1 foot 6 inches broad, and 1 foot 2 inches high. One package of this size can be taken in the Cabin by each adult Passenger. Only the personal effects of the Passenger will be carried as baggage, not merchandise or other property.

The Companies are not responsible for loss, damage, or detention of baggage. Passengers should therefore look after its shipment, and after its landing on their arrival at their destination.

LETTERS AND TELEGRAMS.

Letters to Passengers at ports of call should be addressed to the care of the Orient Line Agents at the respective ports—(see page xlix).

Letters for outward Passengers, sent in the ordinary course to Naples, should be posted in time for the evening despatch from London on the Thursday after the Steamer leaves London. Letters and Newspapers posted after that time will only catch the Steamer if Registered and posted in time for the Evening despatch from London on the following day (Friday). Such Registered Letters should be addressed as follows:—

Registered. *Mr.*.....
On board the Orient Line Mail Packet.....
(*Care of the Commander*),
Naples,

and not to the care of the Agents.

Parcels should not be posted later than the day after the Steamer leaves London. It is important that friends writing to homeward bound Passengers should post their letters in time for them to reach the Agents at port of call some days before the Steamer is due, as the Steamers frequently arrive before their Time Table date. To facilitate delivery on board the Steamer, it is advisable to state in which class the passenger is travelling.

It is recommended that an address be written on flap of Envelope, notifying the address to which the Letter may be forwarded if it should miss the Steamer.

Passengers can, by payment of 10s. at time of booking, have their safe arrival at Albany, Adelaide, Melbourne, Sydney, Launceston, Hobart, or New Zealand, telegraphed to their friends in England; or their arrival at any Port in Queensland telegraphed for 20s. The full address, both of the Passenger and of the person to whom the arrival is to be announced, must be registered when booking passage. A Ticket will then be given to the Passenger, which, on arrival, he will present to the Agent of Reuter's Telegram Company, who will despatch the Telegram. If the Passenger when thus telegraphing records his Australian address in the books of Reuter's Telegram Company there, the charge for telegraphing address in any reply which his friends here may send can be saved.

The cost of Telegrams between Naples and England is 3d. per word, and between Egypt and England 1s. 10d. per word. Addresses are charged for.

CAUTION TO PASSENGERS.—GOODS OF A DANGEROUS NATURE.

Persons concerned in sending or bringing on board the Steamers any goods of a dangerous or damaging nature incur the penalties imposed by statute, besides being liable for all damages.

Passengers are specially cautioned against bringing Matches, Cartridges, Caustic Acids, or other dangerous articles in their baggage.

REGULATIONS.

The object of all regulations adopted on board the Steamers is to ensure the general safety and comfort, and Passengers are requested to conform to them, and to support the authority of the Captain in carrying them out.

Express for Parcels and Small Packages.

Parcels and small packages can be conveniently and cheaply forwarded by the Orient Line. There are arrangements for sending parcels at very low rates covering insurance, including delivery to practically any part of Australia or Great Britain.

Conditions and rates can be obtained from the Managers in London, or from any of the Agencies.

OFFICES AND AGENCIES OF THE ORIENT LINE.

HEAD OFFICE—

FENCHURCH AVENUE, LONDON, E.C.

Managers of the Line: F. GREEN & CO. AND ANDERSON, ANDERSON & CO.

WEST END BRANCH: 16, *Cockspur Street, S.W.*

SYDNEY OFFICE: 39, *Pitt Street.*

(D. ANDERSON, GENERAL MANAGER IN AUSTRALIA.)

Telegraphic Address—ORIENT, SYDNEY.

MELBOURNE OFFICE: *Collins Street West.* (J. N. MARSHALL, BRANCH MANAGER.)

Telegraphic Address—ORIENT, MELBOURNE.

ADELAIDE OFFICE: 28, *Grenfell Street.* (M. G. ANDERSON, BRANCH MANAGER.)

Telegraphic Address—ORIENT, ADELAIDE.

AGENCIES.

		Telegraphic Address.
Aden	LUKE THOMAS & Co., LIMITED.	Thomas.
Albany	J. MCKAIL & Co.	Orient.
Alexandria	R. J. MOSS & Co.	Moss.
Algiers	BURKE, DELACROIX & Co.	Burke.
Antwerp	WALFORD DE BAERDEMAECKER & Co.	Walford.
Bordeaux	H. DAVIS.	Pacific.
Brindisi	FRATELLI NEVEGNA.	
Brisbane	B. D. MOREHEAD & Co.	Morehead.
Cairo	THOS. COOK & SON.	Cook.
Colombo	WHITTALL & Co.	Whittall.
Florence	ALFRED LEMON & Co.	
Genoa	GRANET, BROWN & Co.	
Gibraltar	SMITH, IMOSSI & Co.	Java.
Hamburg	SUHR & CLASSEN.	Carolus.
Hobart	MACFARLANE BROS. & Co.	
Launceston	TASMANIA WOOL GROWERS' AGENCY CO., LIMITED.	
Leghorn	ALFRED LEMON & Co.	Lemon.
Lisbon	E. PINTO BASTO & Co	Pinto.
Mackay	GEORGE SMITH & Co.	
Madeira	BLANDY BROS. & Co.	Blandy.
Malta	O. F. GÖLLCHER & SONS.	Gollcher.
Maryborough	CORSER & Co.	
Mauritius	BLYTH BROS. & Co.	Blythesome.
Messina	OATES & CARRARA.	Carrara.
Naples	HOLME & Co.	Holme.
New York	THOS. COOK & SON.	Coupon.
New Zealand	UNION STEAMSHIP CO. OF NEW ZEALAND, LIM. (HEAD OFFICE, DUNEDIN) AND THEIR AGENTS THROUGHOUT THE COLONY.	
Palermo	W. BEAUMONT GARDNER	Gardner.
Paris	H. LAURETTE & Co., and THOS. COOK & SON.	Etternal. Coupon.
Plymouth	J. PENGELLY & Co.	Pengelly.
Port Said	W. STAPLEDON & SONS.	Stapledon.
Rockhampton	UNION MORTGAGE AND AGENCY CO., LIM.	
Rome	ALFRED LEMON & Co.	
Suez (PORT TEWFIK)	W. STAPLEDON & SONS.	Stapledon.
Townsville	APLIN BROWN & Co., LIM.	
Trieste	SCHRÖDER & Co.	Schröder.
Venice	S. & A. BLUMENTHAL & Co.	

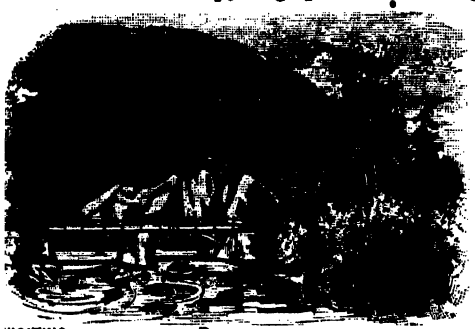
LIST OF

ORIENT LINE STEAMSHIPS.

	Tons.	H.P.
s.s. AUSTRAL	5,524	7,000
s.s. CHIMBORAZO	3,847	3,000
s.s. CUZCO	3,918	4,000
s.s. GARONNE	3,876	3,000
s.s. LUSITANIA	3,877	4,000
s.s. OPHIR (Twin-screw)	6,910	10,000
s.s. ORIENT	5,365	6,000
s.s. ORIZABA	6,077	7,000
s.s. ORMUZ	6,031	8,500
s.s. OROTAVA	5,552	7,000
s.s. OROYA	6,057	7,000
s.s. ORUBA	5,552	7,000

PLEASURE CRUISES.

THE ORIENT COMPANY *despatch, from time to time, some of their Steamers on* **SPECIAL YACHTING CRUISES,** *occupying periods ranging from 2 to 8 weeks,*



ROMSDAL.

VISITING

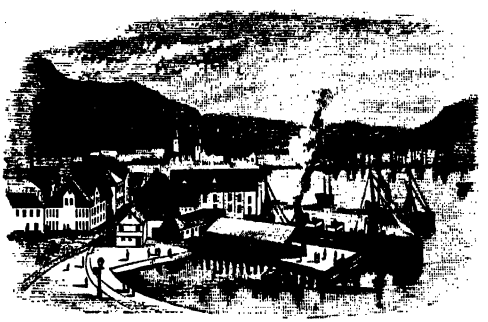
THE FINEST FIORDS,

AND CALLING AT

BERGEN, TRONDHJEM, HAMMERFEST, LOFOTEN ISLANDS, NORTH CAPE, &C.

To **NORWAY,**

(LAND OF THE MIDNIGHT SUN),



BERGEN.

TO THE **MEDITERRANEAN, LEVANT, & BLACK SEA,** VISITING

ALGIERS, ATHENS, PALERMO, NAPLES, THE RIVIERA, MALTA, SMYRNA, CONSTANTINOPLE, SEBASTOPOL, BALACLAVA, YALTA, &c.,



ROME.

ALSO TO

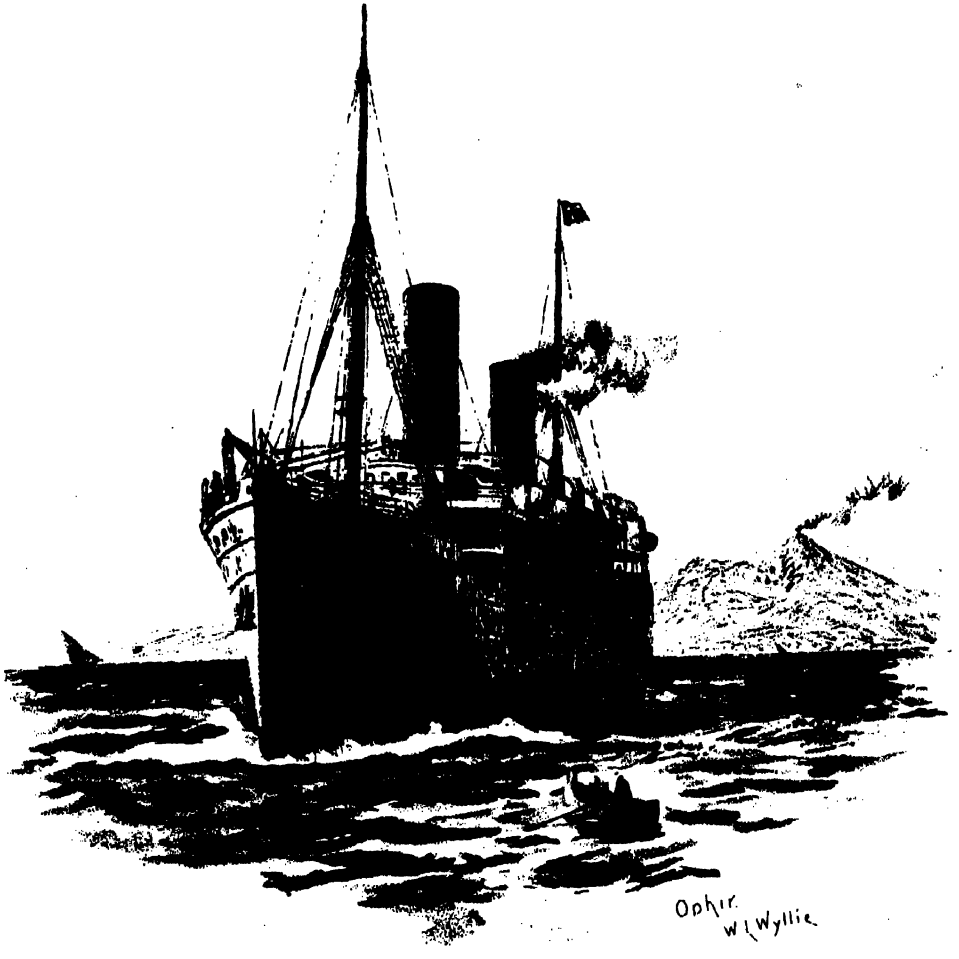
PALESTINE & EGYPT.



ATHENS.

And to MADEIRA, CANARY ISLANDS, and other places of Interest,

ACCORDING TO THE SEASON.


Ophir
W. L. Wyllie

CHAPTER I.

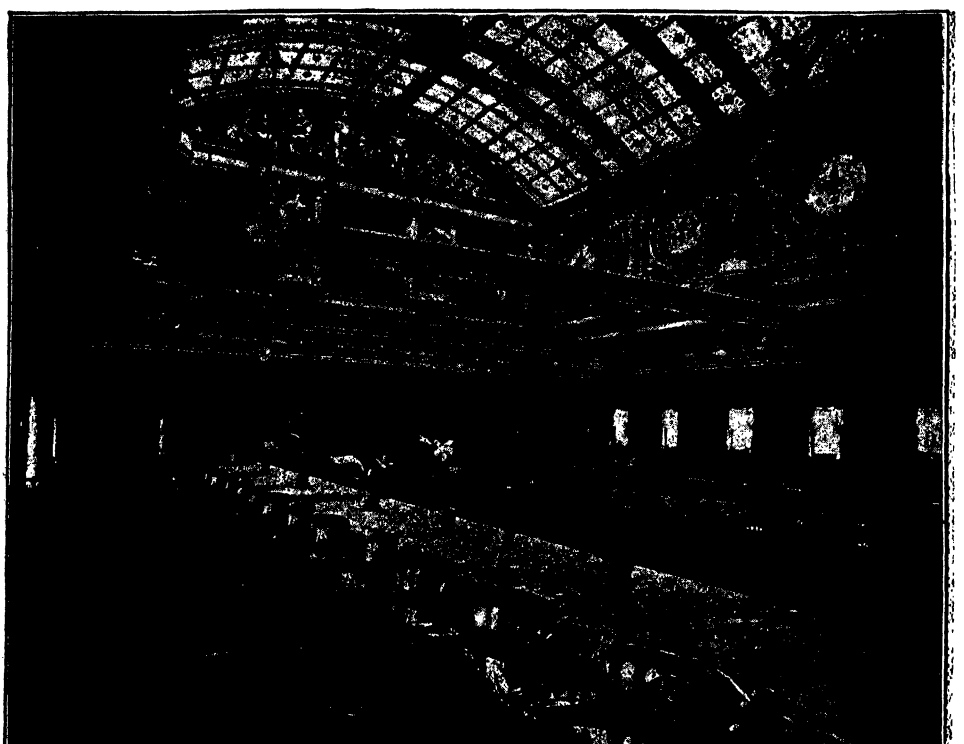
INTRODUCTION.

CHANGES IN STEAMERS.—OCEAN TRAVELLING TO-DAY.—FLOATING PALACES.—SAFETY COMPARTMENTS.—TWIN SCREWS.—CABINS.—FOOD.—RECREATION.—EXCURSIONS.—THE PASSENGER.—THE CAPTAIN.—MARRIAGE AT SEA.—HEALTH.—HISTORY OF THE LINE.—NAMES OF THE SHIPS.

THE change which has taken place in ocean travel within the lifetime of this generation is hardly less remarkable than that which has been witnessed in travel by land since the introduction of the locomotive and the railway system. Twenty or thirty years ago a sea voyage was still regarded by all but the hardy few as a dire necessity, only to be resorted to in the last extremity. The ocean was looked upon not as a highway but as a barrier, hindering access to distant lands more effectually than successive ranges of Alps or Andes would have done. The horrors of life on a steamboat during an ordinary passage across the Atlantic or the Bay of Biscay filled the mind of the traveller, who was compelled to face them, for weeks in advance; and the voyage itself was looked upon as a dismal interval of suffering and discomfort abstracted from the sum of one's ordinary life, and to be forgotten as speedily as possible. America, India, the Cape, Australia, were still afar off; and when some adventurous spirit talked of visiting these distant lands, not of necessity but of his own free will, for amusement or instruction, he became an object of interest and wonder to his friends. Those of us who are old enough to remember ocean travel between the fifties and sixties will be the first to admit that even when the traveller was a good sailor and exempt from the horrors of sea sickness, he enjoyed by no means a holiday trip.

It seems like a tale of the last century, or of times still more remote, yet the marvellous transformation that has taken place in all the conditions of ocean travel, the change from peril, discomfort, and squalor, to safety, ease, and luxury, is but a tale of yesterday. To-day, the ocean voyage has lost its terrors; our seas have become the great high roads of the world, by means of which we pass from land to land,

however widely they may lie apart, with certainty and comfort, and at a rate of speed marvellous compared with anything attained thirty years ago. Every year these highways of the nations become more crowded with passing travellers. The traffic of the ocean grows larger. Men, and women too, cease more and more to contemplate a long sea voyage with apprehension. The distant places of the world are joined together, so that families hardly consider themselves sundered, though some of their members dwell in English cities and others have found a home by



DINING SALOON OF AN ORIENT LINER.

"the long wash of Australasian seas." Over all the vast ocean the great ships go to and fro, knitting our race more and more closely together, and developing in a thousand novel ways the prosperity and well-being of mankind.

Statistics are hardly needed to prove the fact of this great change in ocean travel. Let any one turn to the second page of the advertisement sheet of the

Times, and read there the announcements of the sailings of the steamers of the great passenger lines, and he will get proof enough of the new order of things. These announcements refer only to the sailings from English ports of a limited number of Ocean Lines of steamers, yet they show that from the Thames, the Mersey, the Solent, and the Humber, the great body of traffic on the high seas is daily fed by vessels which in size, strength, and speed, surpass anything the world has seen before, and if one wished to see how the national mind is becoming familiarised to the idea of these long sea voyages, it would only be necessary to go to Fenchurch Street Station on the morning when an Orient Liner has been announced to sail, or to Euston on the Cunard day.

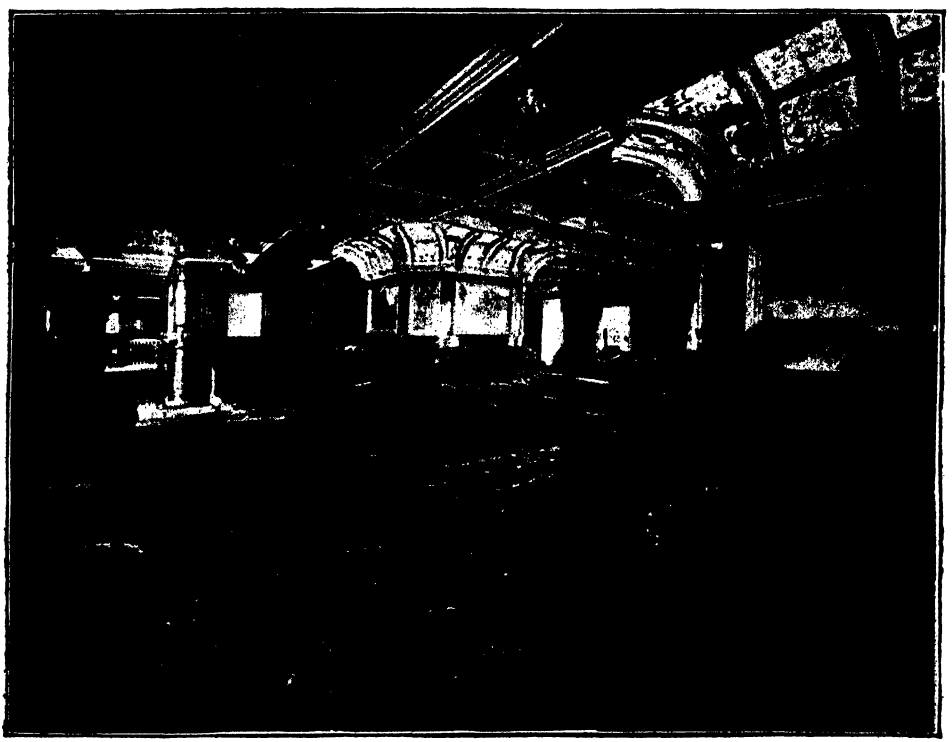
Nor does any one acquainted with the truth think it needful, nowadays, to commiserate the man or woman who, either from choice or necessity, is about to start upon a long voyage. Commiseration, indeed! Who that has made such a voyage but would resent any attempt to pity him? We have said that forty or fifty years ago the great ocean steamers could certainly not be regarded as floating palaces, but the steamers of to-day—the immense liners of the Atlantic, the Cape, the Indian and Australian routes—are in all respects worthy of being described in such words. They are something more than floating palaces indeed, for a palace may be anything but a desirable place of residence. A first-class ocean liner may be likened to one of those palaces which we see in Pall Mall. It is, while the voyage lasts, a club, a co-operative house for passengers and crew. How they live in security and luxury, how they enjoy the pleasures of social intercourse, conversation, and music, a first-class library, and varied games and modes of recreation, is known to every traveller. The once dreaded voyage is now a pleasant time of holiday, to which no small proportion of the passengers look forward with eager anticipation, and which few leave behind them without a certain sense of regret.

There is hardly any possible comparison between one of these great ships of to-day and the largest of thirty, nay, even of twenty years ago. In 1870 a vessel of three thousand tons was regarded as colossal, and very few steamers so large were engaged in traffic anywhere except between Liverpool and New York. Now, from four to seven thousand tons is not thought extraordinary, and on the Atlantic there are ships measuring not less than ten thousand tons. This increase of size, which means so great an improvement in the passengers' accommodation, means also an immense increase in safety. By the use of steel throughout in constructing the hull, and by the scientific sub-division into water-tight compartments, the dangers from collision have been minimised so greatly that a first-class steamer may be almost guaranteed to float under any circumstances.

Increased size of ships has been accompanied by increased engine-power, with a consequent increase in speed and in steadiness; indeed, engine-power has been increased more rapidly than size. This adds also materially to the safety of vessels and their passengers. But it is in the shortening of voyages that the effects of the increased power of the machinery is most conspicuously apparent. It seems but yesterday when the passage from Liverpool to New York occupied from eight to ten days; now it is constantly being done under six days. When the Orient Company first began to carry passengers, the average duration of the voyage to Adelaide was about fifty days. Now the average of, say, the *Ophir* is thirty-four days. The Cape has been brought within half the distance in time that it was from us thirty years ago, and on all the routes of ocean traffic a similar acceleration of speed has taken place. Thus the new ships seem to be conquering space itself, and under their giant strides the very world grows smaller. The employment, as in the case of the *Ophir*, of twin engines and of twin shafts, adds not only to the safety but to the certainty of the passage.

The steamer thus engined and of such size as to afford full accommodation for its hundreds of passengers, is changed in almost every detail from the vessel of former days. The cabins, if they have not grown in size, are at least now perfectly ventilated. Indeed, everywhere between decks the passenger breathes in comfort, free from the poisonous odours which oppressed him formerly. His bed is not the old stuffy bunk, in which he lay, robbed of light and air, but a simple iron bedstead, the most cleanly and healthy of all couches. He can command an unstinted supply of fresh water, and (perhaps the greatest boon of all) he has the electric light at his command, and can make use of it at any moment by day or night. The old order of "Lights out!" which added to the terrors of the sea voyage, in even recent times, is heard no more. Bath rooms and lavatories of the latest construction, equal to anything of the kind to be found on shore, are liberally provided in all the new ships, and such care is devoted to the sanitary arrangements that even the most fastidious will find it difficult to discover any cause for complaint. If we follow the passenger into the saloon we shall probably find it to be a noble apartment, lofty as well as spacious, amply lighted, and decorated with fine carving and works of art. In some vessels it is almost impossible for the unaccustomed traveller to realise, when in the saloon, that he is at sea. The impression conveyed by the eye is rather that he is in the banqueting hall of some stately building. A tasteful and luxurious drawing-room, with piano, library, etc., one or two small writing-rooms, and a comfortable smoking room, are also to be found on all the larger steamers. The promenade deck, with its long range of deck-houses, affords a lee-side where, protected by the

awning overhead, a passenger can, in most states of the weather, find a sheltered seat in the open air, far above the reach of the spray; and when the warmer latitudes have been reached, this deck, with its rows of chairs, electric lights, and deck piano, becomes at night a lounge as pleasant and fair to see as the verandah of a great Swiss hotel. Here we may sit talking, listening to the music, or watching the dancers, while the stately ship is ploughing her way through the lonely ocean at a rate not far short of that attained by many of the Continental railway trains.



DRAWING ROOM OF AN ORIENT LINER.

Perhaps it is in the matter of food that the most remarkable change in the conditions of sea travel has taken place in recent years. Everybody who has been much at sea can recollect the victualling of a ship on a long voyage in old days. He can recall the melancholy show of live stock carried in wretched coops and pens, diminishing visibly in numbers as the distance from home increased, and furnishing

tough and savourless sustenance at the cabin table. He remembers only too well the flavour of "ship's tea"—the very thought of it makes one shudder—the saltness of the salt beef, the dryness of the bread, the never-ending monotony of the dismal round of dishes with which, week after week, we had to be content in even the best appointed vessels. Now, thanks to the use of the refrigerating chambers, the traveller knows no difference between his food on sea and on shore, except that in all probability he finds that both in variety and quality he fares best at sea. Fish,



SECOND CLASS DINING ROOM.

game, delicate fruits, all kinds of vegetables, have been added to the daily menu. You may eat Murray River cod, excellent in quality, and perfectly free from taint, as you are steaming up the Thames, and a well-cooked sole may bring back to you memories of home when you are crossing the waters of the Indian Ocean. And here it is well to observe that while we have been speaking hitherto of the accommodation for first-class passengers, those of the second-class share to the full in the improvements we have described. Their food is the same in quality as that of the passengers in the saloon. The resources of the *cold chamber* are at their service as well as at that of their fellow-passengers of the first-class. Fresh milk and

butter, fresh meat and fish, are served to both classes alike, and a second saloon table is, as a consequence, far more luxurious and wholesome than that which was supplied to any class of travellers in former days.

As regards the third-class passengers also, a vast improvement has been effected in their dietary. Nor has the improvement in their lot been confined to dietary. Great attention is now paid to the cleanliness and ventilation of their quarters, which are lighted throughout by electricity. Their berths are furnished with bedding, and all cabin and table requisites are provided, so that the spectacle is not to be witnessed of a third-class passenger by an Orient ship struggling on board, clasping in his arms his bed and bedding, and these garnished by his mess utensils. The third-class passenger of to-day by the Orient Line steps on board, Gladstone bag in hand, as much at his ease as his fellow passenger of the saloon.

We need not dwell long upon the other accessories of a modern voyage. The traveller finds healthy recreation provided for him at every hour of the day. The old-fashioned games of quoits, shuffle board, and bull, once the only recognised open air sports at sea, are supplemented by cricket and tennis; while the freedom from motion which characterises the larger steamers at all times—except when heavy weather prevails—permits nightly dancing on the brightly lighted decks. In the smoking-room cards, chess, and dominoes serve to pass many an hour away, while the luxurious drawing-rooms are the scenes of nightly concerts. Only those who have made a long voyage to the east or the south can realise how quickly and how pleasantly the time passes for the majority of the travellers.

Such, then, is the reality of a long sea trip under existing circumstances. The results of the change are to be seen in the extraordinary increase in the numbers of those who go to sea, not because they are compelled to do so, but for pleasure and recreation. Many persons prefer to make use of the regular lines of steamers, in order to enjoy a healthy and invigorating holiday. But for those who do not care to sail in the ordinary passenger steamers, special facilities are nowadays afforded. Every year numbers of large vessels leave the shores of England on pleasure cruises. They carry to the grand fiords of Norway, to the romantic and classical scenes of the Mediterranean, and to the tropical beauties of the West Indies, large companies of holiday-makers, who for their own amusement and pleasure, gladly undertake voyages which to their forefathers would have seemed expeditions of peril and hardship. Can any better proof of the change which has taken place in the conditions of ocean travel be desired than this? And in what way can men or women enjoy more abundantly the delights and advantages of foreign travel than by taking passage in one of our great modern steamers? They may go to the wildest

and most savage regions of the world, to the barren islands of the Polar Seas, to African towns which fifty years ago were the haunts of pirates and slave-dealers, to the remotest spots upon the surface of the globe, and wherever they go they carry with them the comforts and luxuries of their English homes. The worries and risks incidental to land travel are unknown to them. The bustle and fatigue of long railway journeys, the discomfort of land hotels, with their poor food and insanitary surroundings, do not exist for them. Their stately ship anchors in the harbour of some famous foreign city in the early morning, and after an English breakfast on board, they go ashore to explore the sights of the place. They have ample leisure and opportunity of doing so, and after a long day's sight-seeing, it is with a sense of relief that they find themselves once more occupying their accustomed seats at the dinner-table surrounded by the familiar faces of their friends. They explore oceans, islands, and cities, and feel all the time they are at home. This is ocean travel as it is to-day—something wholly different from anything it was before, and the marvellous change is the direct result of those improvements in the structure, engine-power and accommodation of our passenger steamers of which we have spoken.

We have been endeavouring to describe the chief features of our ocean traffic at the present day. The reader may possibly object to our mode of handling the subject, that it deals only with the bright side of the picture. That there is another side we are prepared to admit. Now, as in the days of King Canute the waves and the winds are beyond the control of man. At sea as on shore there are days of gloom as well as days of sunshine; and few travellers can fail to recall hours which could hardly be termed hours of unalloyed enjoyment. But to say this is merely to say that the essential conditions of life are the same on the ocean as on shore. What may be claimed with justice for modern enterprise in shipbuilding is that it has done much to mitigate, if not absolutely to prevent, the discomforts which in former days were inseparable from bad weather at sea. Our ships are far steadier than they used to be. In many of them the evil of rolling has been reduced to a minimum, and in all of them the accommodation below has been so enormously improved that the old horrors of confinement between decks during the height of a storm are now practically unknown. Light and air are supplied in abundance to the passenger confined to his cabin; and so well organised is the service of the ship that the possibility of any interruption in the regular routine of meals is scarcely to be regarded. A man need not, indeed, be "an old salt" in order to feel as comfortable in his berth in the height of a gale as he does in his own bed at home under similar circumstances.

A few notes may be found useful as to outfit, health, and amusements on board ship in a long voyage.

In the cabin one good sized box only is allowed to each passenger, and this should be of such dimensions as will permit of its going under the berth. (See the Company's regulations, p. xliv.) This restriction should cause no inconvenience, as once a week, at least, every passenger has access to his heavy luggage. An arrangement of linen bags or pockets is useful to contain not only brushes and combs, but any kind of article which ashore would lie on the dressing table. We must remember that things left about loose are likely to be lost or broken.



WRITING ROOM ON AN ORIENT LINER.

Gentlemen will do well to be provided with dressing suits, which with a cloak or overcoat can be worn on deck in the early morning. When two or more are in the same cabin, it may save much inconvenience, as one or other can then postpone his dressing operations until the cabin is vacant. Ladies will find dressing gowns, and what are called "tea gowns," very convenient in the tropics.

Every passenger should have a deck chair. It should be plainly marked with the owner's name in a conspicuous place, not on the back. A whole row of ladies may be disturbed because their names are on the backs of their chairs, and someone is looking for his similarly distinguished property. A chair that is not injured by being wet is the best. The common canvas deck chair is one of the

worst, as it is not easily dried. Either a wooden seat, or wicker work, or a canvas seat that can easily be removed and taken below, should therefore be used.

With regard to employment on a long voyage it is scarcely necessary to say much here, especially as this book is written for the purpose of employing the minds of passengers on the various scenes and associations of the successive phases of the voyage. But a good many people find reading on deck, in the wind and the sun, by no means an attractive pursuit. To them it is useless to offer any advice on the choice of a subject for study; but, unquestionably, there are many passengers who find that a subject which seemed dull and dry at home might be interesting at sea. Every Orient steamer carries a fairly extensive library.

Sketchers are not so often seen on board ship as might be expected. Yet, if we remember that except for two days at most, we are hardly ever out of sight of land for more than a few hours until we get into the Indian Ocean, we can understand how much material there is for interesting drawings. When land is invisible there is the scenery of the sea; the forms of waves and their colour; the reflection of the clouds above; the sunrise and the sunset; the moon in her phases; all these things will furnish the artist with subjects. It may be worth while to mention here that the most vividly blue sea is to be met with off Candia, where the passenger who has made notes of colour in other places, say at Gibraltar and Naples, will find his palette beggared by the intense sapphire and turquoise of the waves.

For the evenings, dancing is most popular, but music, theatricals, lectures, and many other entertainments may be devised; and it is usual on every voyage to have one fancy dress ball at least, which always causes much amusement as there are no milliners or costumiers on board, and various original devices have to be used in order to produce the desired effects. It may be worth while to mention here that in the larger steamers, the promenade deck being about 240 feet long, and 50 feet wide, the passenger who desires to walk a mile can attain that object by going ten times round.

It will be well to remind readers voyaging for the first time, that in a ship every one is dependent, more or less, on someone else for the comfort and happiness, or misery and wretchedness, of the voyage. Mutual forbearance must be constantly practised, and each passenger must remember that by a little want of consideration he may inflict extreme discomfort, not to say torture, on someone who has the misfortune to be his neighbour. People who cannot play are very fond of strumming on the piano. At home probably this matters little to anybody; on board ship it may annoy hundreds. Various other examples might be mentioned, but we may let this one suffice with the addendum that inopportune music is as annoying as bad music.

For the protection of passengers and all on board the captain is clothed by Act of Parliament with almost despotic authority. He can command anything that in his judgment is necessary to the security and discipline of his ship and the safety of the persons and the property committed to his charge, and the passenger is bound to abstain from conduct calculated to weaken the captain's authority, nor may he interfere with the management of the ship, nor expose his fellow passengers, or, indeed, anyone on board, to annoyance or unnecessary interference. The passenger who misbehaves himself may, or should, be remonstrated with by the captain, who has power, should he continue his offensive conduct, to do whatever is necessary in order to coerce him into better behaviour. The captain's power in this respect, is to secure the safety, discipline, and comfort of the ship and the passengers.

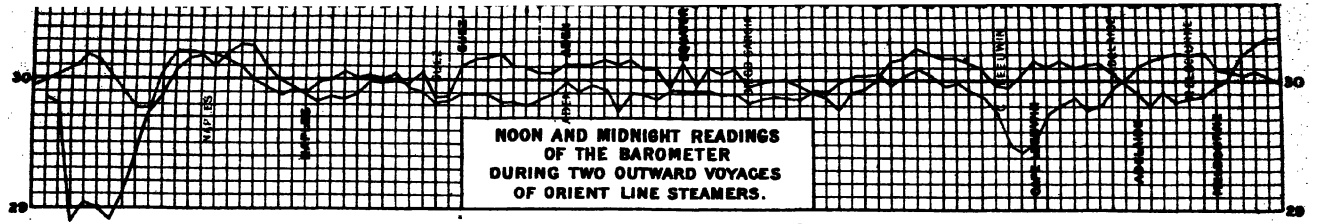
There is a lien on the passenger's luggage for unpaid passage money, but not on the clothes he is wearing, when he leaves the ship. It will be seen that in the discharge of his office the captain of a large passenger steamer has many different, and at first sight almost incompatible, kinds of work to do; he is not only responsible for the course, and for all the scientific arrangements of the ship, but he has also to act as civil governor or magistrate over the community. He is bound to have as much thought and consideration for the poorest emigrant, as for anyone on board. Under these circumstances he is entitled to something more than the mere forbearance of the voyagers: he deserves their sympathy. They owe it to him to avoid troubling him about matters of little moment; or disturbing him when, after passing a long and anxious night on the bridge, he has sought a little well-earned repose. The captain, among his multifarious duties, is expected to read service on Sunday morning, but it is seldom that a clergyman may not be found on board to relieve him. He and his officers have passed severe Board of Trade examinations to test their fitness for their posts, and most of them, and also many of the "hands," belong to that kind of marine militia known as the Royal Naval Reserve.

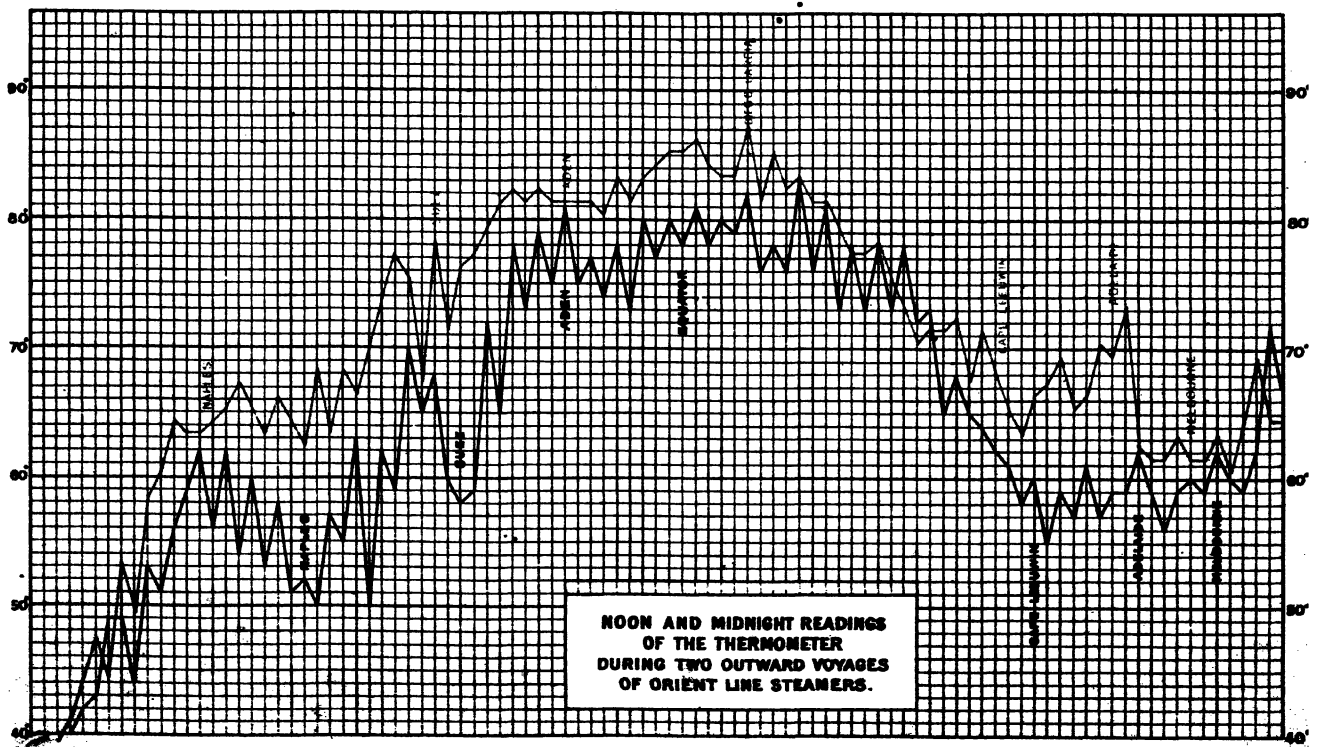
Two events which sometimes occur and are often discussed without occurring, may be noticed here in their legal aspect. Children are occasionally born at sea. No freight is due to the owners in such a case: but the captain is bound to register the birth in the log-book, under the Registration Act. Furthermore, people frequently enquire as to marriages on board ship. A marriage performed by an ordained clergyman of the Church of England using the service of the Book of Common Prayer is certainly valid. It would seem from a debate in the House of Lords that where the presence of a clergyman is impossible, a marriage by consent and before witnesses is accounted valid. This principle has been accepted by the

Law Courts in such a case as that of a marriage up country in India or in the Australian bush. The case of marriage by consent in presence of the captain of a ship has never been adjudicated upon by the courts; but in the Merchant Shipping Act, the captain is bound to enter such a marriage in the ship's log, and to send the particulars to the Board of Trade.

As a qualified medical man is found in each ship of the Orient Line, it will not be necessary to offer any but the most elementary advice as to how to keep the body in health throughout a voyage. The first of all rules is, briefly, when you feel ill consult the doctor. A "first voyager" may feel an unaccustomed experience in the heat encountered in certain parts of the tropics. As a rule, however, the heat is trying only at the lower end of the Red Sea, and often, even there, no inconvenience is experienced. As will be pointed out later, the sufferings supposed inevitable in this region are nearly always avoidable by the exercise of prudence, and have of late been materially diminished by the increased speed of the steamers (which both creates more breeze and shortens the time spent in the Sea), by mechanical ventilation, and by the plentiful supply of ice, which is manufactured on board every Orient Line steamer. The traveller, generally speaking, passes from our so-called temperate regions through a delightfully steady warmth, with possibly an oppressive day or two, into the moderate or hot climate of Australia, according as he arrives in winter or in summer. The constant humidity of the atmosphere is caused by the continuous evaporation from the surface of the sea. Being much more constant in its amount than is the case on land, it affords, as will be explained later on, a valuable protection against chills. The principal constituent of special tonic value is ozone, which exists in much larger proportion than on land, and is supposed to be produced by the combination of wind, sun, and sea. It is credited with tonic and appetizing properties, and some authorities regard it as an aid to healthy sleep. The sea air also contains traces of chloride of sodium (or common salt) and of bromine and iodine, and its electrical condition is further believed to differ from that of the shore atmosphere, while it is of course at constant high barometrical pressure. What hygienic value the latter circumstances may possess, the science of climatology does not yet definitely inform us.

The constant motion of the air has a decidedly exhilarating effect. An ordinary pleasant wind does not travel at the high speed usually attributed to it, and a breeze of 12 to 15 miles an hour is sufficient to produce agreeable stimulation. Accordingly, except in the rare event of the wind's blowing exactly in the course and at the speed of the vessel, such a breeze is always to be enjoyed on a swift steamer by those who wish it, whilst anyone who prefers a still atmosphere may find


30
29
NOON AND MIDNIGHT READINGS
OF THE BAROMETER
DURING TWO OUTWARD VOYAGES
OF ORIENT LINE STEAMERS.


90°
80°
70°
60°
50°
40°
NOON AND MIDNIGHT READINGS
OF THE THERMOMETER
DURING TWO OUTWARD VOYAGES
OF ORIENT LINE STEAMERS.

shelter somewhere on deck. The therapeutic value of sunshine and absence of depressing rainy days is known to everyone. As a rule, there are only a few hours of rainy or very dull weather throughout the voyage, and always a much smaller proportion of it than in health resorts on land. To sum up, the oceanic climate is warm, equably humid, with the purest of all atmospheres, bright sunshine, with as much breeze as is pleasant; and it combines to a large extent an invigorating effect like the climate of a high altitude, with the soothing character of warm humid regions like Madeira. It may be of interest to many readers to note in passing, the cause of the superior equability of temperature. In the first place, air does not itself receive and retain heat. Were moisture absent, we should be quite dependent on the sun, and on heat at second hand radiated from the earth. In perfectly dry air, the earth's borrowed heat would at night be very quickly exhausted by radiation, and this occurs to a great extent in very dry places, causing extreme variations between day and night. But fortunately, the globe is wrapt, if unevenly, with a layer of moisture "like a garment," which can retain some of the sun's direct heat, and, curiously, retain to a greater extent the heat radiated from the earth. The more moisture, the less loss by radiation into the upper strata of air during the night, and the less nightly fall of temperature. Over the ocean the moisture is constant and copious, and further, according to Tyndall, "to the rays (heat) emitted by water aqueous vapour is especially opaque." Thus, less heat is lost by radiation at night at sea than ashore. Again, the sea has a higher "specific heat" than earth, which implies that it is heated and cooled more slowly.

Having considered the climate, we come to regard from a health point of view the changed habits produced by the conditions of sea-life. On the vital change we laid stress at the beginning of this article. Climate would be of little account were it not for the substitution of an out-door for an in-door life. An observer might be misled into thinking that the complete rest, the freedom from care, obligations, work and worry generally, with the entire change of scene and the influence of novel and beautiful surroundings, must be more potent for good than even the circumstances to which we have assigned the first place. But it is not only the hard-worked individual who benefits, but also those who are as free from compulsory occupation ashore as afloat, and who, having had no exertion, need no rest. The restfulness of the passage is of special benefit to the over-taxed professional or business man. He finds that beyond dressing and taking meals, he need undergo no mental nor bodily exertion whatever, and may enjoy a long rest of a fulness unattainable ashore, and enhanced by the reflection that

every hour spent on deck, instead of being wasted, is increasing his bodily power and capacity for labour.

As regards the muscular system, whilst the motion of the vessel causes a continuous and generally imperceptible employment of the numerous muscles engaged in maintaining whatever posture is assumed, muscular exhaustion is always unnecessary, and the modicum of exercise required by the individual may be obtained by the methods familiar to passengers.

We may conclude this chapter with a brief historical and chronological statement as to the origin and progress of the Orient Line. The steamships began to run in June, 1877, when the *Lusitania* was despatched from London to Adelaide, Melbourne, and Sydney, *via* the Cape of Good Hope. In the following year the joint efforts of Messrs. Anderson, Anderson & Co. and Messrs. F. Green & Co. founded the Orient Steam Navigation Company. At first only a monthly service was intended, but very soon it became plain that the traffic demanded fortnightly sailings. When in the beginning of 1880 the fortnightly service was determined upon, the Company were fortunate in obtaining the co-operation of the Pacific Steam Navigation Company. The steamers which formed the Orient Line in the early years have been nearly all replaced by larger and swifter vessels, built specially for the service, both by the Orient Company and the Pacific Company. The sailings have since regularly continued fortnightly from both ends, and, since 1888, under contract with the Postmaster General.

Some Notes on the Names of Orient Steamers.

"AUSTRAL," as the name of a ship, is, of course, a reference to the southern hemisphere. We say Austral-asia, meaning "Southern Asia," and the "Austral signs" of the Zodiac, meaning the last six.

"CHIMBORAZO" is a volcano in the South American state of Ecuador, and is situated in latitude 1° 30′ S., and longitude 79° 2′ W. It rises to a height of 20,000 feet, and is one of the highest mountains in the new world, Aconcagua being 22,867 feet.

"CUZCO" is the ancient capital and still one of the chief cities of Peru. Before the recent destructive war with Chili, it had a population of 40,000. It is in latitude 13° 30′ S., and longitude 71° 20′ W.

"GARONNE" is the name of the great French river on which the city of Bordeaux is situated.

"LUSITANIA" is the ancient name of a Spanish province, nearly answering to the modern kingdom of Portugal.

"ORIENT" means, literally, "rising," and refers to the East:—

> "Morn in the white wake of the morning star
> Came furrowing all the Orient into gold."—Tennyson.

"ORIZABA" is the name of a mighty mountain on the chain of the Andes in Mexico, about seventy miles inland from Vera Cruz. It is in latitude 18° 50′ N., and longitude 97° 0′ W. It rises to a height of 17,367 feet, and its snowy summit is visible 200 miles away at sea in clear weather. It is volcanic, but has been inactive since 1856.

"ORMUZ" was the great emporium of eastern trade in the middle ages; a summary of its history and an account of its present condition will be found on p. 119.

"OROTAVA" is the name of a town in Teneriffe, the largest of the Canary Islands.

"OROYA" is the name of a town in the province of Junin, near Lima, but east of the Cordilleras, in Peru.

"ORUBA" is the name of an island in the West Indies, off the North Coast of Venezuela. It is in latitude 12° 36′ N., and longitude 70° 8′ W.

"OPHIR," a place several times referred to in the Bible (1 Kings ix. 28, 2 Chron. viii. 18, Psalm xlv. 9, Isaiah xiii. 12) as producing, for King Solomon, gold, precious stones, and algum, or sandal wood. It has been variously identified with Aden and the Malay Peninsula, but is more probably Ceylon. The Hebrew and Arabic name, Safir, or Sofir, may survive in our word Sapphire. The Phœnicians traded with Aden in gold and precious stones, but they cannot have been produced there, and must have come from some place further south or east.

CHAPTER II.

THE MOTHER COUNTRY.

AUSTRALIANS IN ENGLAND.—TOPOGRAPHY.—LONDON BY THE THAMES.—GREENWICH.—THE DOCKS.—DEPTFORD.—THAMES TUNNEL.—THE TOWER.—THE CROWN JEWELS.—THE ARMOUR.—ST. PAUL'S.—LONDON AND THE SUBURBS.—OLD LONDON.—WESTMINSTER ABBEY.—LONDON SIGHTS.—THE NATIONAL GALLERY.—THE BLENHEIM RAPHAEL.—THE SUFFOLK LEONARDO.—THE TITIANS.—THE WATERLOO VAN EYCK.—HOLBEIN.—TURNER.—GAINSBOROUGH.—THE STORY OF "THE PARISH CLERK."—HAMPTON COURT.—ITS HISTORY.—WINDSOR CASTLE.—SUMMARY OF ITS HISTORY.—PLACES NEAR LONDON.—ELTHAM.—EDGWARE.—THE CHARM OF ENGLISH SCENERY.—TRIUMPHS OF ENGINEERING.

WE may begin our account of the principal places visited by the ships of the Orient Line with a few words about the land from which they sail. If this book was intended only for Australians it might be worth while to point out the advantages of a visit to England. But year by year more and more of our colonial brethren recognise how necessary such a visit is to the full cultivation of the mind, to say nothing of the health of the body. The pleasure of a voyage to England can hardly be exaggerated. Every well-educated Australian will long to make it, and in the following pages it is proposed to call the attention of the traveller to a few of the more important sights of London, not wholly neglecting the results of a visit to more distant parts of the three kingdoms. Topography means the study of a place, and in England topography includes a great many other things. Where a country is newly settled and has, so far, figured but little in history, topography includes geography, geology, and zoology, but little more. In Europe, on the other hand, it comprises all these sciences, and many besides. We want to see lands where great events have taken place, plains where fierce battles have been fought, cities that have sustained long sieges, houses where mighty men were born, and to visit the famous galleries and museums and libraries, where works of art and relics and records, older

by thousands of years than the civilisation of a new country, are to be seen. Such sights open the mind. The intelligent traveller who has used his eyes abroad, goes home wiser and better. He has seen much that he could admire—much too, it is to be feared, that must serve to warn him; but a day in one of the capital cities of Europe has taught him more, not only in art, history, and politics, but in social science, than he could learn in years of reading at home.

The Australian who would receive the fairest impression of London cannot do better than sail up the Thames, say by one of the regular Gravesend steamers. A more complete idea of the magnitude of the great City and its Trade is thus afforded than any other method of approach can give.

On leaving Gravesend there is little of immediate interest along the distant banks until Greenhithe and Erith are passed on the left, and Purfleet, with its peculiar chalk cliffs and great powder magazine, is passed on the right hand. After this, however, manufactories and works of one kind and another become more frequent, and to the left stretch away the flat Plumstead Marshes, chiefly known as the locality for every kind of gunnery experiment. On the same side of the river Woolwich is seen with its great arsenal. The dockyard, with its building-sheds, is now practically deserted. Immediately after passing Woolwich, away inland on the right, is seen the beginning of a forest of masts which mark the presence of the vast docks and shipping of the Port of London. These docks, on both sides of the Thames, occupy an area which can only be measured in miles. Some idea of the magnitude of the trade of which that forest of masts is but one of the outward and visible signs may be gathered from statistics. The foreign and colonial produce imported amounts in value to £150,000,000, and the custom's duties collected, although by far the largest part of the imports is duty free, amounts to £11,000,000. The population is reckoned, within the police district, at almost 5,000,000; and the rateable value of the houses at considerably more than £30,000,000. Figures like these convey but a faint idea to the mind; but the visitor coming up the Thames from Tilbury or Gravesend and afterwards continuing his journey to, say, Richmond or Hampton Court, will be amazed at the seemingly endless succession of buildings which line the banks, with hardly an interval, for some thirty miles or more. It may reasonably be doubted if any of the great cities of antiquity equalled London, either in area or in population; and certainly no ancient or modern city excels it in magnificence and wholesomeness. On the right hand is presently passed the historic Blackwall, where, in the old sailing ship days, so many a parting and arrival has taken place. Here is the entrance to the East India Docks. A sharp bend to the south carries us up Blackwall Reach to Greenwich, and when Greenwich appears on

the left we may be said to be in London, for Greenwich, although five miles from Charing Cross, is now joined to it by a continuous street. The first important public building that meets our eyes is Greenwich Hospital, once a royal palace, now the Royal Naval College. It is a larger building than any palace in England, except Windsor Castle, the front, towards the river, being 290 yards long, and the square in the centre, of which we get a passing sight through a vista of coupled pillars, 190 yards wide. The Hospital, a monument to the virtues of Mary II., was established by her husband, William III., and on the forfeiture of the adherents of the Old Pretender, the estates of the Earl of Derwentwater were assigned for its maintenance. It was opened in 1705 to admit 100 seamen. During Nelson's victories, as many as 2,700 seamen, many of them maimed, were supported here. In 1869 the Hospital was abolished, pensions being preferred by most sailors. The buildings bear the mark of many minds and many hands, but the whole design, one of the most successful for picturesqueness and stateliness combined, is to be attributed to the genius of Christopher Wren.

Before Greenwich is out of sight, it may be worth while to recall the fact that Henry VIII., Queen Mary, and Queen Elizabeth were born, and Edward VI. died, in the old palace here; and to look up, through the park, to the famous Observatory from which longitude is reckoned as east and west of Greenwich.

On the opposite shore is the Isle of Dogs, once a kind of delta, formed by the Essex river Lea, which here fell into the Thames. It is now a network of Docks. These form the Port of London, though not a single dock is in the City itself, the nearest being St. Katharine's, made in 1828, with the moderate size of twenty-four acres, which at that time was thought enormous. It is now completely surpassed by many others, and especially by the new Tilbury Deep Water Docks which have recently been completed, and are described more fully in another chapter. St. Katharine's is on the site of an ancient hospital of that name which was removed to Regent's Park, when the ground on which it stood was dug out and carried to Pimlico, some miles higher up the river, where it was employed to fill up and raise a marsh, on which streets and squares, some of them now most fashionable, were built.

There are few of us who have not read with interest the memoirs written in his diary by John Evelyn in the reign of Charles II. As about one mile from Greenwich we pass Deptford, we are reminded of him, for he lived at Sayes Court, where we still see, among masts and chimneys, a few green trees. They mark the site of a public garden and museum given to the place by the present representative of the Evelyn family. It was here that Peter the Great lived for three months when he

was studying shipbuilding in the adjoining dockyard. Many are the complaints made by Evelyn at the illtreatment his gardens received from the Czar and his half-civilised servants. Among the Treasury Minutes there is one recording the payment to him of £162 7s., in recompense for the damage done to his house, goods, and gardens at Deptford "by the Csarizes Majestic and his retinue."

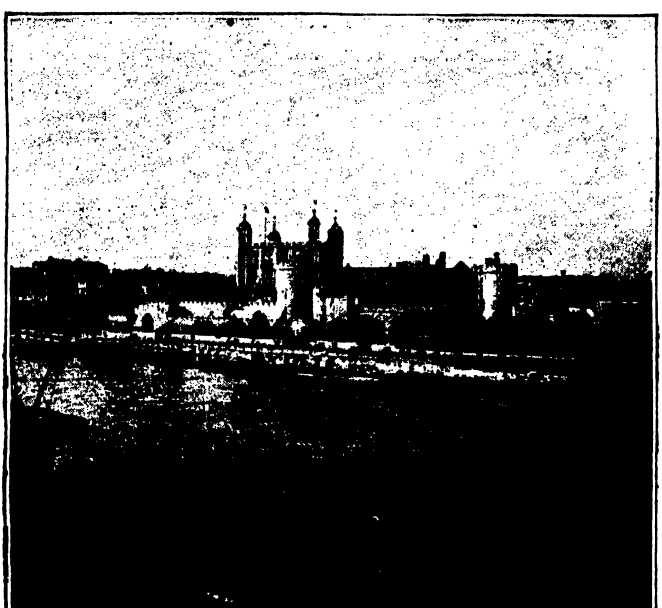
A little beyond Deptford we pass Millwall with its docks on the right, and the western entrances to the enormous West India Docks, which cover 295 acres. From the time we passed the Albert Docks, we have, in fact, been moving along parallel with an almost continuous line of dock walls. At Shadwell we come to the London Docks, of about 120 acres. Immediately opposite is Rotherhithe, or as it is often pronounced Redriff, a place which looks unsavoury enough now, but which was a fashionable watering place in the reign of Henry IV., who lived here for four months in 1412, for the sake of the fine air. Here are now the Commercial and Surrey Docks, covering together about 350 acres.

We are now over the Thames Tunnel, an undertaking which forty years ago was looked upon as one of the wonders of the world. It cost half a million sterling, and was eighteen years in course of construction owing to the difficulties encountered by the engineer, Brunel. At one time the works were abandoned, but eventually the tunnel was completed, and long struggled on under a load of debt. A bazaar was held in it at first—a railway runs through it now. Its place, for foot passengers, has been supplied by what is called the Tower Subway, which was constructed by Mr. Barlow in less than a year for about £16,000. The tunnel connects Wapping with Rotherhithe, though Wapping has changed its name, and is now generally called St. George's-in-the-East. But Englishmen will never forget the song of "Wapping Old Stairs." We next pass under the still incomplete works of the Tower Bridge.

From this point we have one of the most interesting views in England, or perhaps, to an Englishman, in Europe. The group of buildings to the right looks familiar, though we may never have seen it before. For a moment we do not realise that these turrets and vanes, that large staring white house with small windows, the long and embattled wall and terrace by the riverside with the quaint arched gateways, are the Tower of London. It is, after Tilbury Fort, the first piece of historical antiquity which the Australian sees if he approaches London by the Thames, the Tower Bridge framing it, as it were into a picture. The following brief account is summarised from the *Authorised Guide* to the Tower, to the larger edition of which the reader must be referred for further information.

The ground on which this ancient fortress stands marks the extremity to the south-east of the old Roman Wall. There are Roman bricks in the foundation of the

White Tower, the "keep" of the castle. But the two bastions of the old wall were entirely covered or removed, and the oldest buildings are the keep mentioned above and the Wakefield Tower near the entrance, in which the Crown Jewels are now kept. These were begun about the year 1078 or twelve years after Hastings. The grim walls, ancient as they look, have been refaced and "restored" over and over again. Nearly all the windows have been altered, and of the little that was left in 1709, nearly all was destroyed about twenty years ago. Nevertheless, there is enough in



THE TOWER OF LONDON.

the Tower of London to make a visit extremely interesting. It is, or has been, a fortress, a palace, and a prison. Now, it is a museum, and something more, for it is a museum with historical associations about it, a sight to see both for what it is and for what it contains.

The Crown Jewels are in the custody of an officer who lives in the adjoining tower, but even he may not open the case in which they are preserved, except in the presence of the Lord Chamberlain. They consist of a large number of articles, nearly all of which date from the restoration of Charles II., but an anointing spoon seems to

be a relic of the old regalia. The Queen's crown forms the summit of the whole collection of gold and precious stones, and, though the most modern of the objects shown, will be regarded by the visitor with the greatest interest. It contains no fewer than 2,783 diamonds, 277 pearls, 17 sapphires, 11 emeralds, and 5 rubies, including one which belonged to the Black Prince and was in the helmet of Henry V. at Agincourt.

The collection of armour is chiefly in the upper chambers of the White Tower, where it is well arranged and well lighted. The Beauchamp Tower, with the prisoners' inscriptions, must not be passed by; and the enterprising sight-seer will make an endeavour to get into the little church of St. Peter and Vincula, where so many illustrious personages lie buried.

When we have passed the Tower, and even sooner, we see rising more than four hundred feet from the river's level, the vast dome of St. Paul's, one of the most perfect monuments of architecture in the world. If it has a fault it is its uniform character: it has no incongruities, and may be thought in that particular to be somewhat wanting in picturesqueness. But when the visitor sees it, not straight in front, but at some corner, or when at his first walk through the City, he pauses at Peel's statue, at the western end of Cheapside, and looks towards the vast and well-proportioned dome rising above the bright green foliage which now adorns the churchyard, he will be forced to allow that the view is, to say the least, extremely pleasing. To the architectural student St. Paul's is a building of unrivalled interest. It is the only cathedral on a large scale, designed and carried out in one style, in England, with the exception of Salisbury, and the traveller from Australia will do well to compare the two buildings, as the most perfect of their kind in the world. It is a popular error, repeated in former editions of this book, that St. Paul's was designed by one architect, Sir Christopher Wren, "built under the superintendence of one clerk of the works, Edward Strong, and during the lifetime of one bishop, Henry Compton." Mr. Wheatley, in his *London Past and Present*, has shewn that Thomas Strong preceded his brother, Edward, as clerk of the works, during the episcopate of two bishops, Henchman and Compton. Sir Christopher's son put on his father's grave in the crypt the eloquent words—

Si Monumentum requiris circumspice.

If you seek his monument, look around you.

Here, Nelson and Wellington, and many other great soldiers and sailors, sleep in peace, and the memorials of many who perished in foreign lands, are placed here. Near Wren's, are the graves of Turner, the landscape painter, and of Landseer, whose works, as represented by engravings, are familiar and popular all over the world.

We are now in London, the greatest city in the world. Like Melbourne, it consists of a central nucleus, so to speak, and of an immense ring of suburbs. The centre is "The City," and its population, during the day, composed of people employed in various kinds of business, amounts to about 300,000. But the census is counted at night, when the citizens have betaken themselves to their suburban dwelling-houses, and the few tradesmen who live at their place of business, together with an army of caretakers and housekeepers, only counted up some 13,000 individuals in 1891. It was usual to speak of the whole mass of streets and houses as the Metropolis, or the Metropolitan Area, but this is, strictly speaking, an ecclesiastical term, and belongs not to London but to Canterbury. The term occurs in many carelessly worded Acts of Parliament, but since 1888 the suburbs on both sides of the Thames, whether in Middlesex, or in Kent, or in Surrey, have constituted a new "County of London," distinguished thus from the "City of London," which has never been reckoned in any county, although before the Act nine people out of ten would have told you that London was in Middlesex. It would, in fact, been more correct, both legally and historically, to say that Middlesex was in London, all the usual rights of an English shire in self government being absorbed by the city. Since the passing of the Act mentioned a great mass of suburbs has been formed into a "County of London." The visitor from Victoria will understand this arrangement if I say it is as if, leaving Melbourne to itself, as a commercial centre, Carlton, Hotham, Kew, Hawthorn, St. Kilda, Prahran, and the other suburban townships, were formed into a single district under the title of County of Melbourne, while the rest of the County of Bourke was left out in the cold. So far, we have not found the experiment succeed, and what is left of Middlesex complains of its comparative poverty, and laments its former connection with the city. This connection, which is one of the curiosities of English history, began in times immemorial, and was recognised and confirmed by a King so remote from our own time as Henry I., the son of the Conqueror. He, in 1101, gave Middlesex to the citizens "in farm," at a small fixed rent, and allowed them to appoint a sheriff for it. This grant was only abrogated by the Act named above.

The following paragraphs are an attempt to summarise the history of this wonderful city :—

London, to judge by its name, which is a relic of the language of the ancient Britons, and means "the fort of the waters," was in existence when the Romans came. They built a bridge over the Thames, and made a strong castle at either end of it. A vast ring of suburbs grew up about these forts, and after they had been repeatedly plundered and burnt in various rebellions and wars, Constantine, or one of his

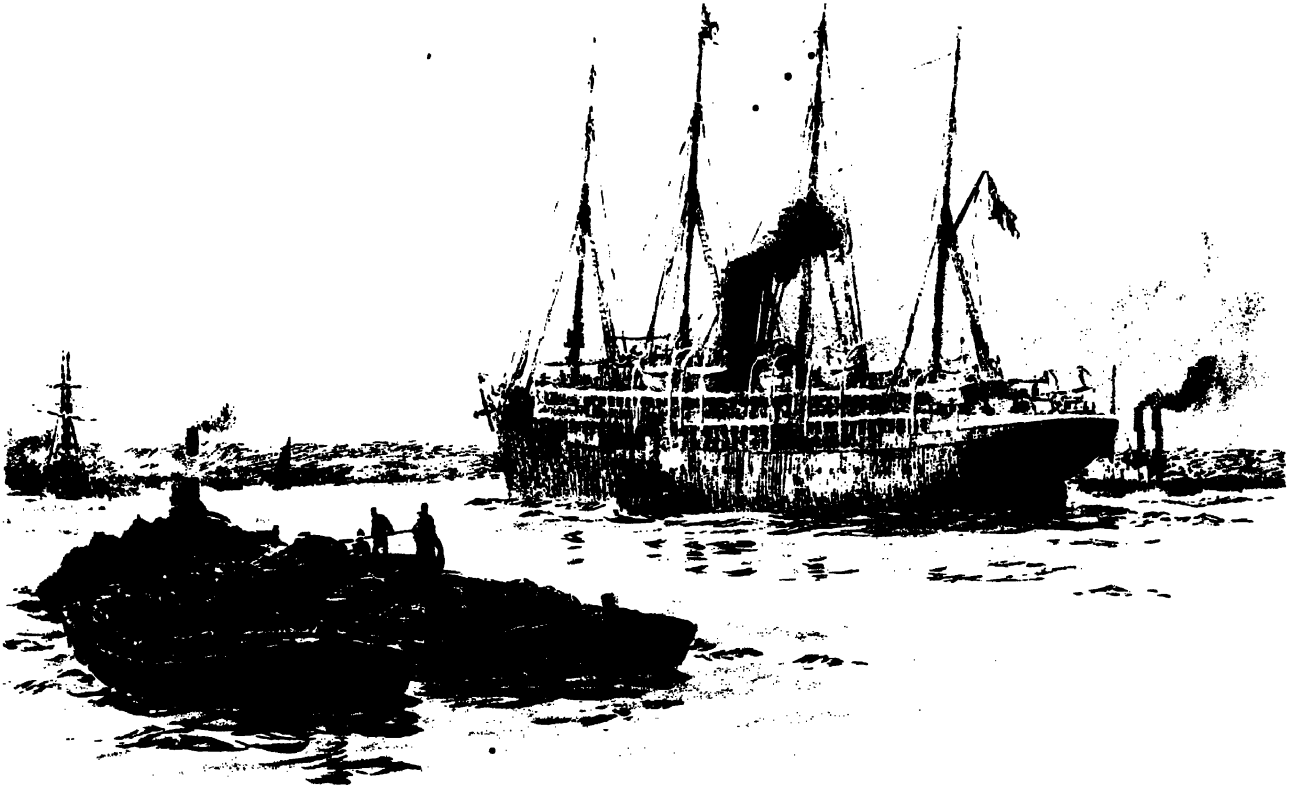
immediate successors, built a wall round them. The old "pretorium" had stood close to where Cannon Street Terminus stands now: and we must suppose that it continued to be the head quarters of the Roman soldiers. But when they were withdrawn, the Britons could not defend London, and it is believed that for a long time the city lay empty and desolate. King Alfred saw its value as a defence against the Danes, rebuilt the broken wall, and may well be styled the founder of modern London. William the Conqueror burnt Southwark, but approached London cautiously. He was at Berkhampstead, a few miles to the northward, when a deputation of the citizens came out and offered him the crown. William in return gave them a charter confirming to them the old English liberties, of which so little remained to the conquered Saxons in other parts of England. Under his successors London flourished. The trade with the King's foreign possessions was immense: and the government of the city, which under Richard I. was intrusted to a mayor, was carried on in such a way as to foster commerce, secure liberty, and maintain order. By the time of King John, London was so powerful that she obtained a special clause in Magna Charta, and her liberties were the model on which the new constitution of England was moulded. The city was much oppressed by Henry III. In the reign of Edward I., the office of alderman became elective, and the still subsisting division into wards was made. A little later the old semi-religious trade guilds were superseded by companies which still exist, every freeman of the city being enrolled in their ranks. At first they regulated trade, each in its own department; and the Fishmongers, Goldsmiths, and some other companies, still discharge functions of the kind. The majority, however, are only engaged in the distribution of charitable and other funds, and in supporting schools. In the Wars of the Roses, the city took the Yorkist side, and contributed largely to the ultimate success of Edward IV. Henry VII. was unpopular with the citizens, from whom on various pretexts he obtained vast sums of money. Henry VIII. was always liked in London, and his suppression of the religious houses was highly approved of by the people who, especially within the walls, had many causes of complaint against the monks and friars. The persecution of the reformers under Queen Mary was particularly ruthless in London, and the fires of Smithfield turned the people more and more against the old religion, so that under Elizabeth, who was always very popular in the city, they went into an opposite extreme, and by the end of the reign of James I., the majority were Puritans. After the execution of Charles I., whose fall is in great part attributable to his illegal oppression of the citizens, a reaction set in, and the interference of Cromwell and the Long Parliament in city affairs was so much resented that, at the restoration of Charles II., London was completely loyal.

Charles and his successor James II. found their tyrannical schemes much impeded by the civic privileges, and London was for a time deprived of its charter. The advent of William III. was therefore joyfully hailed, and in his reign, and that of Anne, the wealth of the merchants increased rapidly, the foundation of the Bank of England in 1694 being one of the greatest commercial events in London history.

The city from the time of the Great Fire in 1666 diminished in population, though it increased in wealth; and in the reign of George II., even the old walls and gates disappeared. The suburbs had spread in all directions, and had become greater by far than the city itself. As far back as the reign of Henry I., the citizens obtained the royal rights in the county of Middlesex from the crown; and very soon houses and monasteries began to spring up outside the walls. In the reign of Henry III. the Strand formed a continuous street towards Westminster, where the abbey was rebuilt by the King with great magnificence. Henry endeavoured to curtail the privileges of the citizens in Middlesex in favour of the abbot, but only alienated their affections, and they soon succeeded in obtaining from him an acknowledgment of their ancient rights. Holborn on the west, and Stepney on the east, became thickly inhabited by the end of the reign of Edward III., and Westminster was rapidly increasing, especially when the law courts were permanently fixed in the King's palace. Richard II. built Westminster Hall, one of the first great events in which was the King's formal deposition and the accession of Henry IV. At the dissolution Westminster Abbey became a deanery, and the dean still occupies the abbot's place. Meanwhile, the suburbs have spread in all directions, and the City of London itself has become a mere place of business, with but few inhabitants, the houses consisting for the most part of magnificent offices, often situated in narrow lanes and courts, which still bear witness to the crowded state of old London.

The Great Fire which consumed the city in the reign of Charles II. had a remarkable effect on its healthiness. The plague, which had been almost constantly raging in some form or other, and was especially severe the year before the fire, now ceased wholly. We still see the effects of the fire in the almost complete absence of the old-fashioned Gothic churches, which are so common in other parts of England. But London justly prides herself on the churches built by Sir Christopher Wren, whose towers and spires form such beautiful features when seen from the river, the magnificent dome of St. Paul's standing out among them as the central and principal object of the view.

Among the public buildings of the city, the Guildhall, in which the citizens have assembled for more than six centuries; the Royal Exchange, where the business of half the world is transacted; the Bank of England, the Mansion House, the General



Post Office, and, not far from it, the old prison of Newgate, should be seen by the visitor; who will also be interested by St. Giles' Church, Cripplegate, where John Milton is buried, and where a bastion of the ancient wall is still standing; by Crosby Hall in Bishopsgate Street, where Richard III. resided for a time, and which Shakespeare mentions in several places; but above all, the Tower of London, of which we have spoken already.

Beyond the city limits the visitor will find much that is interesting. Westminster Abbey will probably delay him longest. I have dwelt on its picturesqueness and its incongruities in another publication from which I venture to make an extract. If we ask what it is that makes a building picturesque, the answer would seem to be that each feature however incongruous, should be good in itself. "Incongruity of this kind, amounting here and there to sharp contrast, is the poetical element in half the views in Westminster. What would the florid Perpendicular of the chapel of Henry VII. be without the Renaissance tombs and the classical monuments of the Buckinghams? What would the side aisles be without the 'hearses' of Elizabeth and Mary? What would the chapel of St. John be without the Frenchman's Lady Elizabeth Nightingale and the Dutchman's Sir Francis Vere? This contrast, in a less forcible manner, is also seen between the different periods of purely Gothic work. Standing under the Chapel of the Annunciation we mark on one pillar traces of the architecture of three Henries—the Third, the Sixth, and the Eighth. Standing in the Decorated Cloister we can look into the thirteenth-century passage to the Chapter House, or the low vaulting of the Confessor's buildings. At the west end of the nave we can admire in one view the lofty arcade of Edward I., and the Perpendicular oriel of Abbot Litlington. So, too, from the Dark Cloister we look into the Italian arches which surround the garth of the Infirmary.

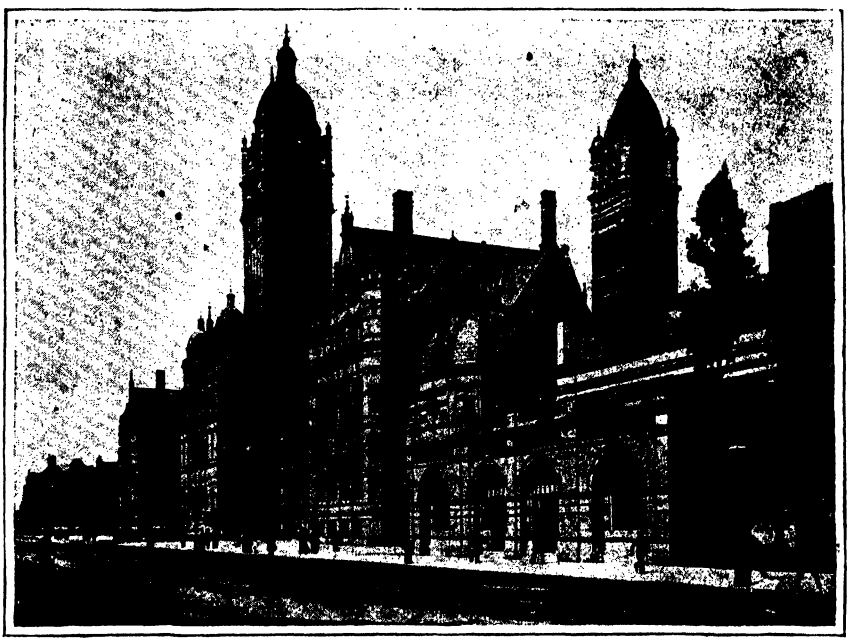
"Beside the purely artistic pleasure to be derived from such contrasts—a sensation like that produced upon the taste by the contact of two metals, a kind of æsthetic shock, gentle, yet rousing—there is the sentimental side, too. The rugged coffin of the Hammer of the Scots, the signs of a nation's mourning in the costly monument of the victor of Agincourt, the long-neglected grave of the first Protestant king, the beautiful image of the beheaded queen—these all make calls on the sympathetic faculties. There is a reality in them which puts life into history. Can we resist a thrill when we find we are standing by the monument of Dan Chaucer? By the starved Spencer's grave a 'needless Alexandrine' comes with a sigh to the lips: 'That Death him did await in daily wretchedness.' Can we pass without a smile the epitaph, 'O rare Ben Jonson'? Would not Lytton have liked to know that he should sleep among princes in the chapel of St. Edmund? Here is the grave of Handel,

with the 'Hallelujah Chorus' open before him, and there the altar-tomb of Stanley, who hated music. While you are looking for the epitaph on Goldsmith you are standing where Dr. Johnson, who wrote it, lies buried. At the other end of the transept the great Chatham and his still greater son sleep in the same grave; and three graceful statues grouped round one pillar recall the illustrious statesmen of one name and lineage who attained greatness by serving their country in such various walks of life.

"It may be worth while to summarise chronologically the principal features of the Collegiate Church of St. Peter in a single paragraph. Of the Church of the Confessor nothing remains except a doorway high up on the southern face of the transept. To guess what it was like we may pass through the Dark Arches or look at the Refectory wall beside the south walk of the cloister. The eastern apse is of the building of Henry III. His pious son—pious in the classical sense—nearly completed the nave, which was actually finished in almost the same style under Richard II. The chantry of Henry V. must have been upreared while Henry VI. was still a child. The chapel of Henry VII. was really built by Henry VIII., whom we habitually think of rather as an iconoclast than as a builder. To James I. are owing the last royal monuments ever set up in the church. Under Charles I., Inigo Jones built Ashburnham House, and Burlington designed the Dormitory in the days of the first Hanoverian King. Wren built a north front, now pulled down, and one of his pupils the western towers, under George II. Cottingham was the first of the modern school of 'restorers' who worked at the Abbey; but little of his time remains —the time when the coronation of George IV. and the novels of Walter Scott helped so strongly to bring about the 'great Gothic revival.' Sir G. Scott, who lies buried in the nave, rebuilt the Chapter House and fitted the choir and the altar as we now see them. Mr. Pearson has just completed the new north front of the transept, as to the merits of which critics are not agreed."—(*Catalogue of an Exhibition of Drawings*, 1891.)

There is also at Westminster a modern building at which most of us will look with the deepest interest. To it even the Abbey will yield. The old palace is gone, but already enough of association has gathered about the Houses of Parliament to render them well worth a visit, even to those who do not care for splendid architecture, gorgeous decorations, fresco paintings by great artists, mosaics and stained glass. The ancient hall, with its fine oak roof, forms an appropriate vestibule to the parliamentary precincts, and now that the shabby buildings in which for many years the chief courts of law were seated have been pulled away, we are able to see the western side with its long roof and its buttresses, unfortunately too much "restored."

The new Courts of Justice are situated at Temple Bar, and stand partly within the old city boundary. The visitor whose time is limited will perhaps be contented with a view of the exterior, and will hasten on to the National Gallery, a mean-looking building on a fine site, or to the British Museum, where ancient books, Greek sculpture, Egyptian and Assyrian monuments, majolica, ivories, and many other objects of curiosity or beauty will contend to detain him; or to the South



THE IMPERIAL INSTITUTE.

Kensington Museum, where only art and not mere curiosity is admitted, and where the principal institution is flanked by the India Museum and the Imperial Institute, the Museum of Natural History, and other shows, more or less interesting; or to the Albert Hall, or out to the Crystal Palace, to hear good music; or—and to my mind this is the most wonderful sight of all—to the Park on a fine afternoon in the season, that is between the 1st May and the end of July, to see the carriages and horses, and the gay throng of the fashionable world, with perhaps a glimpse of the Prince and Princess of Wales, and even, as a piece of very good fortune, of the Queen herself.

Many of our readers may prefer the National Gallery to any other of the permanent sights of London. Considering that the collection has almost all been gathered during the present reign and some of the best pictures have been bought during the past few years, it does credit to the taste and munificence of the nation. In two respects our collection stands out by itself among the galleries of Europe. It contains very little or no rubbish. There are whole rooms in most of the foreign galleries which are not worth visiting. In Trafalgar Square, you must, if possible, look at everything. Secondly, the pictures are in a very genuine and unsophisticated state. The great picture of all has this merit in an eminent degree. This is the Raphael from Blenheim; the only Raphael now known to exist, with the exception of one which hangs near to it, which has not been more or less repainted. The merits of this picture are not easily enumerated without the use of those technical terms which are so puzzling to the uncritical. But anyone may see the delicate beauty of the faces of the Mother and the Divine Child, the adoring expression of St. John, and the solemn piety of St. Nicholas. Nor should the exquisite landscape background be overlooked. Artists will recognise in the composition a kind of subtlety which exists in all Raphael's work; and while the drawing, with certain peculiarities, is almost faultless, the colour is most harmonious. The subtlety in composition is even more remarkably displayed in the little "Vision of a Knight," which is apparently an allegory, and represents a young man in armour asleep, Virtue and Vice seeming to offer him their several inducements. Some interpret the figures as War and Peace, some as Learning and Pleasure. The colouring is extremely brilliant and well preserved, but the composition is the most remarkable thing about this wonderful little picture. Every leaf on the tree, every feature in the elaborate background has been drawn in its proper place and painted so as to heighten to the utmost the effect of the whole design.

In the new galleries, as re-arranged, it is possible at last to do justice to this and other great masters. The row of pictures by Raphael is probably almost if not quite unrivalled elsewhere. Besides these, there are some dozens of paintings which a lover of art will think worth a very long journey. It is only necessary to mention a few. In a room we pass through to reach the Raphael collection, is the Suffolk Leonardo da Vinci, sometimes called the Holy Family of the Rocks. A similar picture is in the Louvre, slightly differing in some details, and, according to most critics, in a much less perfect condition. The group, which consists of four figures, is remarkable more for the beauty of the faces of the Blessed Virgin and of the angel than for any other quality; but the drawing cannot be surpassed. There is a certain want of colour which detracts from the excellence of this lovely picture.

Next to the Raphaels and the Leonardo in importance are three great works to which the name of Michael Angelo must be applied. The "Raising of Lazarus" stands No. 1 in the Gallery lists. It is known to have been designed by the great Florentine, but the execution of the painting has usually been attributed to his pupil Sebastian del Piombo. When, recently, a thick coat of dirt and varnish had been taken off, the colour was found to be splendid in tone, and in excellent preservation. Two other pictures, "The Entombment" and a "Holy Family," are of interest chiefly to the student.

The Titians, at least two or them, are very fine, and a number are "school copies," to which the glorious Venetian's name has been conjecturally applied, but the Bacchus and Ariadne is among the great pictures of the world, and the "*Noli me Tangere*" is of exquisite beauty, but in a quieter key of colour. The visitor is strongly recommended to inspect most carefully those Italian pictures to which no artist's name is appended. Such pictures would not have been purchased had they not shown qualities so high as to make up for their want of a history. This is a hint which would be worse than useless in most galleries, but, so carefully has the collection been made, that among the very best are "St. Jerome in his Cell," "Venus and Adonis," "A Knight in Adoration," "The contest between Love and Chastity," and a good many more, all of which are by unknown artists, though their school may be easily identified.

Passing from the Italian rooms, we may briefly mention a portrait group by Van Eyck, which for harmony of colour cannot be excelled. It represents John Arnolfini, a Pisan merchant who lived at Bruges—where his house existed till lately—and married a Flemish lady, Jeanne de Chanany. The room and its furniture are portraits as well as the husband and wife, and Van Eyck records on the wall that he had been there himself in 1434. There is an interesting history attached to this marvellous picture. It was known to be in existence in 1524 when it belonged to Margaret of Austria. It can be traced to 1566 when it was supposed to have been lost on its way to Spain. At the Battle of Waterloo a Colonel Hay was wounded and was carried into a neighbouring house where he was kindly attended, but lay long ill. This picture is said to have hung on the wall of his bedroom, and at his departure making very handsome pecuniary acknowledgment of the attention he had received, his grateful landlady presented him in return with a picture as a souvenir. That is one version of the story which is somewhat difierently narrated in the catalogue. In 1842 the picture was bought by the nation.

For a long time the gallery was without an example of the work of Holbein, who had come to be regarded as almost an English artist and the artistic ancestor of our

modern school. This has been demonstrated to be an error. Our English school flourished before and beside, and after Holbein; but it was for every reason desirable that our National Gallery should not be without one or more of his pictures. This want was partly supplied by the loan of a portrait of a "Duchess of Milan," a lady to whom is said that Henry VIII. sent an embassy with proposals of marriage and who replied that she would be very willing if she had chanced to possess two heads. The lady, as represented, has an arch expression and looks as if she would have been perfectly capable of the epigram attributed to her. A drawing for this picture, which belongs to the Duke of Norfolk, is at Windsor. A couple of years ago it was rumoured that Sir Frederick Burton, the director of the gallery, had been offered the famous Holbein at Longford Castle, which had once been exhibited at Burlington House as the "Ambassadors," a splendid work, and very interesting, apart from its merits as a picture, for the accessories and for the question as to the identity of the two personages represented. A committee of liberally disposed gentlemen speedily found more than half the required price, the Treasury finding the rest, and with the Holbein two noble portraits by Moroni and Velasquez were purchased at the same place.

Another grand Velasquez was presented to the gallery by Lord Savile some years ago, "Christ at the Pillar." There is a room devoted to these Spanish pictures, and Murillo is as well represented as Velasquez. When we pass to the English and modern side of the gallery the pictures of Reynolds and of Gainsborough will be found very attractive. "The Snake in the Grass"; the "Angels' Heads," all portraits of a little Miss Gordon; the "Infant Samuel," and the fine pictures of Lord Heathfield, better known as General Elliott, the stout defender of Gibraltar, are all by Reynolds. There are also many fine works, some of them landscapes, by Gainsborough, and one of them deserves special mention. It needs no artistic education or critical faculty in the seer, but will charm everybody who looks at it. It is Gainsborough's portrait of Edward Orpin, who, more than a hundred years ago, was parish clerk of Bradford-on-Avon, in North Wiltshire, not far from Bath. A few miles further north, just at the boundary between Wilts and Somerset, is a handsome country house named Shockerwick, built by a wealthy tradesman named Wiltshire, who had been a carrier between Bath and London. Having occasion to take some pictures to London for Gainsborough, who was then living at Bath, he refused to receive any repayment from the artist. This generosity led to a friendship springing up between them, and Gainsborough visited at Shockerwick. It was the custom on Sunday evenings that Orpin should come over from Bradford and read the Bible to the Wiltshire household. Gainsborough was often of the party,

and has immortalised the appearance of "The Parish Clerk," in a picture which remained nearly a century in the family of Mr. Wiltshire. In 1867, when the last Wiltshire of Shockerwick died, several beautiful Gainsboroughs, which were almost or quite unknown to the public, made their appearance at Christie's, and this, the gem of the collection, was secured for the National Gallery. A landscape, "The Hay Waggon," with portraits of Miss Wiltshire and others, was exhibited at the Grosvenor Gallery lately, and came from the same house.

The Turners, to which a whole room is given, comprise some of the great landscape painter's best, and more of his worst, works. Among the best is the exquisite view known as "Crossing the Brook." Unfortunately his oil pictures have too often faded and become discoloured, and others can never have been of the first quality, while many are simply grotesque. Yet the beauty of "Crossing the Brook" seems to grow greater as the years pass on, and the blue haze of the distant valley to rise and reveal new features. It is a view of the Tamar, the river dividing Devonshire from Cornwall, and was taken from high ground above Calstock, the bridge of which forms such a picturesque object in the middle distance. To judge of Turner aright we must descend into the basement, where a large and beautiful collection of his water-colour sketches and finished drawings is exhibited.

To many visitors the Landseers will prove most interesting. There is the famous Newfoundland dog, Paul Pry, known as "A Distinguished Member of the Humane Society." Near it the bloodhound Grafton and the terrier Scratch form the group known far and wide as "Dignity and Impudence." The plump bay mare in "Shoeing" was named Bess, and belonged to Mr. Bell, but the donkey was Landseer's, and so was Laura, the bloodhound. Altogether the gallery contains fourteen of Landseer's best pictures.

A small collection of very choice pictures is in Buckingham Palace, and some rare portraits are to be seen in St. James's Palace, but neither is open to the public, a special order from the Lord Chamberlain being necessary. But two other and greater palaces, Windsor Castle and Hampton Court, are easily visited from London, and are especially interesting to anyone who loves pictures, for at Hampton Court he may see most of what remains of the old royal collection partially dispersed at the death of Charles I., and at Windsor a whole room is devoted to Vandyck, and there are many other pictures of note.

The visit to Hampton Court should be made on a fine summer's day. The galleries are closed on Friday, but the beautiful gardens and Bushey Park adjoining are always open. The old state apartments are full of pictures, many of them very fine, especially some little portraits by Holbein, and the series by Sir Peter Lely,

known as the Hampton Court beauties. The cartoons of Raphael used to be in a kind of corridor connecting the king's and queen's apartments, but they are now at South Kensington. It is probable they will be replaced at Hampton Court. Their place is occupied by a scarcely less interesting series of nine pictures by Andrea Mantegna, painted in or about 1492. Mr. Law, to whose accounts of the *Palace* and of the *Pictures* I must refer the reader who wishes for further information, calls these paintings, old, faded and retouched as they are, "Mantegna's greatest and richest work, the glory of Hampton Court, and one of the most artistic treasures of the English Crown."

Architecturally speaking, this palace is full of interest and beauty. About half of it dates from the reign of Henry VIII., and the rest from the reign of William III. The earlier part is in the Gothic of that period, and comprises the famous hall, hung with lovely tapestry, several suites of apartments, including those built for Queen Anne Boleyn and the chapel. These are not all shown to the public, but the hall and an adjoining chamber are generally open. The newer part of the palace was designed by Wren, for William and Mary, and, like the older part, is mainly built of red brick, with stone dressings. The observant visitor will admire the skill of the carver in many places, and the ornaments with the combined initials of the King and Queen, all of which are throughout designed with a view of setting off the beauty of the whole building, and not, as in too many modern houses, of concealing its defects. The garden fronts and the Fountain Court are very complete as examples of Wren's powers. The principal entrance, by which the visitor obtains access to the state apartments, is under a colonnade of classical design, very incongruous with the Gothic architecture surrounding it, but very picturesque, in consequence, to the eye of an artist.

The history of Hampton Court connects it with many interesting personages. Cardinal Wolsey obtained a lease of the site from the lord prior of St. John at Clerkenwell in 1515, and for eleven years amused his leisure moments in improvements and magnificent buildings, "to show," as he afterwards said to his covetous master, "how noble a palace a subject may offer to his sovereign." Henry made very little show of modesty in the matter, and after Wolsey's disgrace lived here with his new Queen, Anne (Boleyn). The palace was the birth-place of Edward VI. when Queen Jane (Seymour) died. Here Queen Katharine (Howard) was arrested, and her screams are said still to be heard in the passage adjoining the Chapel. Charles I. was at Hampton Court under a kind of restraint, and contrived to escape to a boat on the Thames. Cromwell caught his fatal illness while living here. We have seen how much William III. did for the place, and Queen Anne lived

in the palace very frequently. The interesting and formal gardens on the south side must have been laid out at that period, but the famous vine was only planted in 1769, after Hampton Court had ceased to be the habitual residence of royalty. There are certainly no places of public resort more attractive, and the visitor, especially if he comes from afar, should endeavour to see the great avenue of Bushey Park, which close adjoins Hampton Court, while the horse-chestnut trees, of which it is wholly composed, are in flower.

Hampton Court is twelve miles from London; and Windsor is more than half as far again, but on the whole is quite as accessible; owing to the number of railway lines which run to it, or pass near it. There is no place in England more impressive than Windsor Castle. Except when the Queen is actually in residence it is open to the public, and the wealth of beautiful pictures would in itself, apart from all associations, make a visit very interesting. But there is not much of architectural or historical importance in the state apartments, which at the oldest, only date from the reign of Charles II. This wing of the Castle, which as early as the reign of Edward III. was the royal nursery, was rebuilt by Wren, and was long known as "the Star building," from a representation of the badge of the Garter on the northern front. It was remodelled and made "Gothic" by Sir Jeffrey Wyatville, under George IV., and contains some very fine rooms. The basement, which, of course, the visitor does not see, is very ancient, and at least one chamber may be held to date from the time of Edward III.

Those parts of the Castle, however, which may always, or almost always, be visited are by far the most interesting and beautiful. Windsor Castle may be described as comprising two great wards, the Upper and the Lower. The Upper is to the east, the Lower to the west. The Upper Ward was probably first built by Henry I., and was rather a fortification than a residence, the King's house, until the reign of Henry III., being in the Lower Ward. The northern side of the Upper Ward is now occupied by the State Apartments already mentioned, and the east and south sides by the private apartments of Her Majesty, while the great mound of the Round Tower, laid out as a garden, forms the western side. The Round Tower, which was mainly built by George IV., is well worth a visit. From the summit, it is said, twelve counties can be descried. The mound is very ancient, probably Saxon. Earl Harold, afterwards King, killed at Hastings, resided here, probably in a wooden house. Edward III. hastily "ran up" a tower for his "Round Table" when he founded the order of the Garter; and what remained of it was renewed, and raised to its present altitude by Wyatville.

In the Lower Ward the chief feature is the Chapel of St. George. This magnificent building, as we see it now, chiefly dates from the time of Edward IV., and the smaller chapel of St. Edward to the eastward from the time of Henry VII.; but both have been much altered and renewed; and Wolsey's tomb house, as the small chapel was long called, has become the Albert Memorial, and has been completed and decorated in a style of the utmost magnificence. Under it, but approached from St. George's, is the royal vault, where George III. and many of his descendants lie entombed. The visitor should not fail to observe the roof, with coloured and gilt bosses, and the plates of the Knights of the Garter in their stalls, the most ancient order of chivalry now surviving.

North of the chapel are two or three small but very picturesque courts, which should on no account be neglected, as they contain all that is left of the ancient palace of Henry III. Westward are the Horse Shoe Cloisters, which have been wholly transformed within a few years, but still retain some picturesque features, if few of antiquity. The North Terrace which extends along the brow of the cliff passes under the windows of a charming Elizabethan building, in which is the Queen's library. The view from the terrace is unsurpassed in England. The visitor will find it hard to tear himself away, but he has yet to see the Long Walk, a magnificent avenue connecting the Home and Great Parks, commenced under Charles II. It leads to the summit of Snow Hill, a distance of two miles and three-quarters. Here stands Westmacott's colossal bronze statue of George III., and from here a beautiful view is obtained of the Castle and town, with Eton College and its chapel in the back-ground. The Great Park, backed by Virginia Water, Ascot Heath, Swinley, Cranbourne Chase, and other large tracts of woodland, extends almost to Sandhurst, and is full of beautiful scenery and variety.

The following summary of the history of Windsor may be acceptable to the reader. It is from the volume published by Messrs. Seeley:—

"At Windsor Henry I. married his second wife, and Henry II. compared himself to an eagle pursued by his own offspring. Here John came when Magna Charta was signed; and here Edward III. was born. Here the first chapter of the oldest and noblest Order of European Knighthood was held. Here the Black Prince married the Fair Maid of Kent, and Froissart saw the King mourning for Queen Philippa. David Bruce and James Stuart, Kings of Scotland, were here imprisoned, and the young Earl of March, heir to the English Crown. In spite of his father's gloomy foreboding, Henry VI. was born at Windsor, and passed every winter in the Castle while he was a child. His holy shade lingers rather at Eton, beyond the river, than in his birth-place. Edward IV. is more conspicuous at Windsor. He

made the beautiful chapel, and lies buried in it himself, the first of a long line of kings; but Richard III. brought hither the body of Henry VI., and the rivals rest side by side. Henry VII. vaulted the chapel and built the tomb house for himself, and though he is buried at Westminster, Henry VIII., his son, lies under his father's chapel at Windsor "by his true and loving wife, Queen Jane." Cranmer, Ridley and Latimer were at Windsor on their last melancholy journey to their fiery martyrdom at Oxford. The great Elizabeth loved the place, and did not Shakespeare immortalize the *Merry Wives of Windsor* at Her Grace's express command? Her successor was often here and made that strange character, Antonio de Dominis Dean. One snowy afternoon in February, 1649, the White King's headless body was laid, without funeral rites, in the grave of Henry VIII. Cromwell saved the Castle, and Dean Wren saved the records of the Garter, and Wren's more famous son built what are still the state apartments for Charles II. William III. was at Windsor, when the poor boy, his nephew, the hope of the nation, celebrated his last birthday, and almost on the morrow sickened and died. Queen Anne pursued the deer in the park in a one-horse chaise; and Cumberland, under the first Georges, retired to his ranger's lodge to sulk. Windsor was in decay when George III. made it his chief residence, and everyone remembers Madame d'Arblay's account of the discomfort endured by the royal family and their courtiers. George IV. lived in a lodge in the park, while Wyatville made the old castle what it is now, and gave it the outline so familiar to all Englishmen."

To this we may add that George IV. died in the chamber at the north-eastern corner of the Castle in 1830, William IV. in the same room in 1837, and the Queen's Consort, the lamented Prince Albert, by a strange coincidence, in the self same chamber on the 14th of December, 1861.

The stranger in London is naturally bewildered at first by its size, but when once a few geographical facts about it are mastered, it is found that there is no place easier to get out of in every direction, and thus it therefore forms one of the most convenient of possible headquarters during an English visit. We can run down to the south coast in a single hour by railway. It is not a quarter of a day's journey to Oxford, or Cambridge, or Stratford-on-Avon; it is not half a day's journey to Portsmouth or Bristol; it is a short day's journey to Liverpool, or a long one to Glasgow and Edinburgh. The smallness of England, the frequency of large towns, the enclosures everywhere, the almost complete absence, except in remote places, of wide open spaces, are the features of the country which, even more than its antiquity, impress one most on fresh arrival from the Colonies. That from so small a mother so great an offspring should have gone forth to people the earth, and that the English

language should be more widely spoken than any other, are the results of causes which began to work in this island some fourteen centuries ago, causes which some have endeavoured to classify as Truth and Liberty, but which are the ideas implanted in every Englishman's mind, whether he be born in the Mother Country or in one of her Colonies.

The visitor from the Antipodes finds the foggy atmosphere of London oppressive, except in the height of summer; but he should endeavour to time his visit so as to see the great city in what is locally called "the season," that is, during the session of Parliament. The country visit should be made before or after, but no one can be said to know what London is like who has not stood in Hyde Park on a fine afternoon in May or June, and watched the display of wealth and taste there exhibited; and every one will wish to attend a sitting of the Houses of Lords and Commons, to see the judges on the bench, to hear the great speakers and preachers of the day, to visit the Royal Academy, and to make a pilgrimage to the tombs of the mighty men of old time who lie buried in Westminster Abbey and St. Paul's. In the autumn you may attend cattle shows and the congresses of learned societies in the country; but London at that time of the year is "out of town," and though as full in reality as ever of people, does not offer to a stranger those attractions which are best calculated to make his visit pleasant and interesting.

The environs of our great city, as I have remarked, contain few buildings of high architectural pretensions; but, in proportion as the scene is homely, the events which give it celebrity are often among the most important in our annals. Within a short afternoon's walk we may visit two palaces, Greenwich and Eltham, for example, whose history, if fully written out, would be the history of England for perhaps three hundred years. At Greenwich was born, in the closing years of the fifteenth century, the boy who was destined to change the religion of his country, and here, eighteen years afterwards, he entered into the unsuitable marriage which was the ultimate cause of the Reformation. Here, too, the son on whom Henry rested all his hopes gazed his last on the world he had hardly entered, and if we could call up the picture of the old palace by the river's bank, and join the crowd who assembled that summer afternoon in 1553, when the rumour had gone abroad that the king was dead, we might see the thin pale face of the dying boy, raised for a moment to the latticed window to show the people that Edward VI. still reigned over them. Here, too, more than a hundred years later, we might have seen thousands of loyal subjects, all lately Republicans, streaming through the park and up the hill, and swarming over Blackheath, on their way to welcome home King Charles II. from his long exile. It would be easy, in short, to devote all the space at my command to the associations of this one place.

Scarcely second in interest is Eltham and its palace. The long-roofed barn was once the great banqueting hall of kings. Here we may sit with Froissart, and see King Edward's guests come in, knights of the newly-founded order of St. George, and ladies dressed in robes covered with their husbands' armorial bearings, and mitred abbots with their cowled attendants, and pages, and minstrels, and tall guards bearing halberds. With the building itself standing, it is not so difficult to realise what the scene may have been like. Here in this hall two Parliaments at least were held; and it was customary for all our kings to spend Christmas at Eltham from the time of Richard II. to that of Henry VIII.

The park was broken up at the Commonwealth, and eventually divided. The central portion gives its name to one of the principal events of the sportsman's year, for Mr. Blenkiron kept his stud in the Middle Park, and here, after his death, Blair Athol, one of his horses, was sold for no less than £13,125, the highest price, up to that time, ever given for a racehorse.

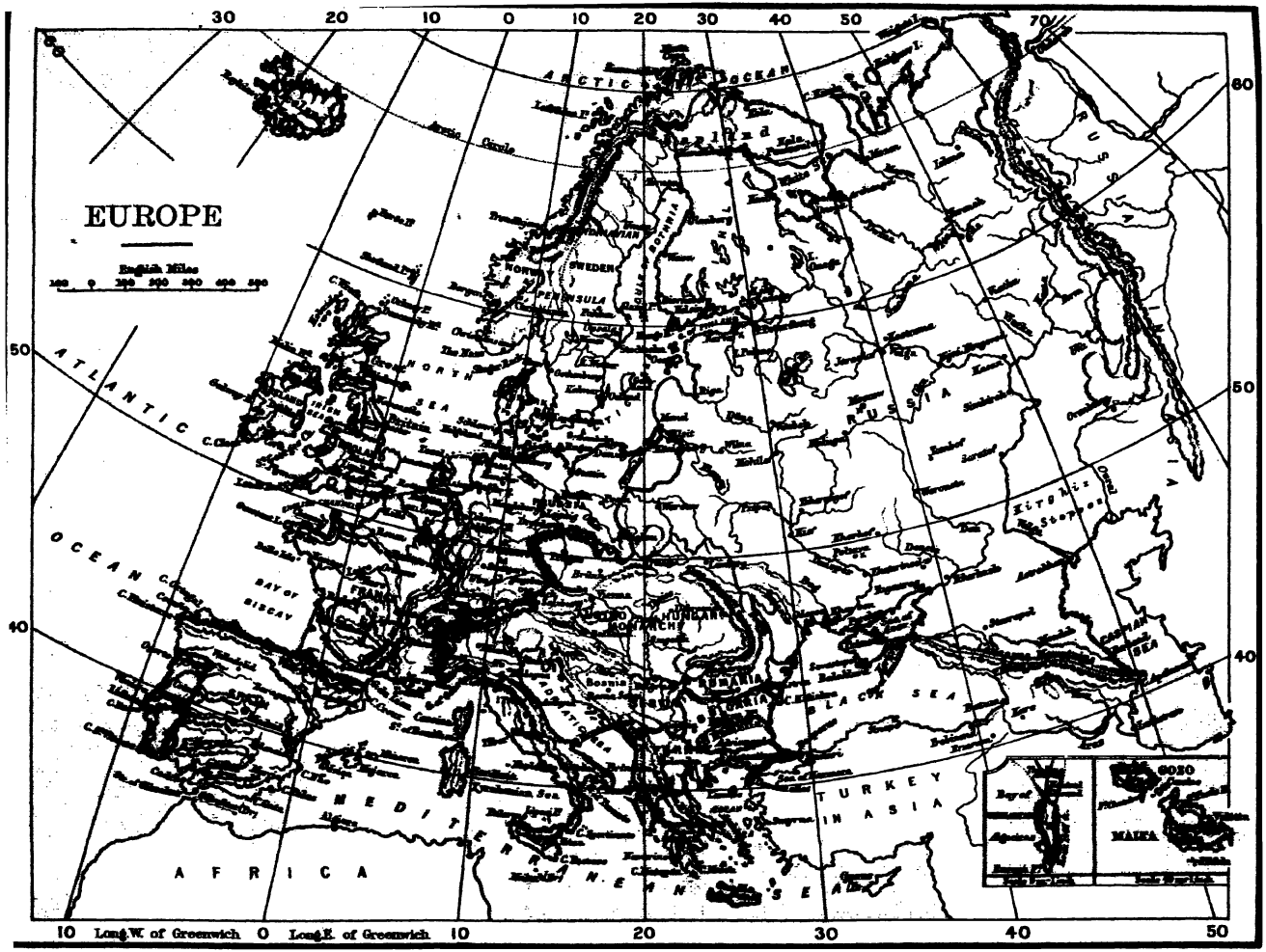
Most excursionists seem to prefer to go in a southerly direction when they take a day out of town. But there are many points of interest north, east, and west as well. If we go out towards "merry Edmonton," along the route traversed by John Gilpin, we pass through Tottenham, and are reminded that, equally with the kingdom of Scotland, this manor was the inheritance of a family whose co-heirs were Bruce and Baliol. Bruce Castle is a school, standing among fine old trees; and its scholars will tell you with pride that here for a time Sir Rowland Hill was master, and dated from Bruce Castle the letters and pamphlets by which at length he succeeded in convincing our rulers of the advantages of the penny stamp. Izaak Walton and William Cowper have given celebrity to the name of Edmonton, and it needs nothing more to add an interest when we remember that in Bay Cottage Charles Lamb lived and died, and that he lies buried in Edmonton Churchyard close by.

A little further west is Edgware, an ancient town on an ancient road—a road, indeed, so ancient that there are good grounds for believing it was in use before the Romans came into Britain. The Saxons named it the Watling Street, being the name they gave to the Milky Way in the heavens above, for the road runs in a north-westerly direction, and may still here and there be traced all the long distance from Dover to Chester. At Edgware we may see the blacksmith's shop where Handel conceived an immortal melody. The smith was parish clerk at Whitchurch close by, and bore the name of William Powell, and if you go to Little Stanmore, as Whitchurch is commonly called, you will not only see his grave, with a bar of the "Harmonious Blacksmith" for an epitaph, but may also see the very organ on which Handel played in the very church where so many of his compositions were first heard.

If Eltham reminds us of Blair Athol and his extraordinary price, Whitchurch should remind us of Eclipse, the fastest horse on record. He died at the age of 26, and was buried in Canons Park, in 1786, where his grave is still pointed out.

If we turn our steps westward the objects of interest are most numerous, we have seen what Hampton Court and Windsor contain. Nearer London, the oldest inhabited house in England is Fulham Palace, which the Bishops of London have had for a villa ever since there was a bishop. At Chiswick House, a little further on, two great statesmen drew their last breath, Fox and Canning; and across the river at Putney, a greater than either, William Pitt, died in 1806, at Bowling Green House, near the heath. At Richmond, all but a fragment of the palace is gone where Henry VII. died, and where Henry VIII. entertained the Emperor Charles V.; but the park, the making of which was one of the most unpopular acts of the unfortunate Charles I., remains the joy of all lovers of English scenery. But to any one who has read history intelligently and who is content with the green lawns and old trees, with shady lanes and primrose banks, with little churches and quaint epitaphs, with stately red-brick houses and arching avenues, there is no part of England in which they more abound than within ten miles of London. The ancient church at St. Alban's is one of the longest single buildings in the world; but there is a charm about the more obscure and less visited spots, which is wanted where crowds assemble; and not even the Alps are to my mind so beautiful as the ordinary English landscape, with its verdure, it antiquity of association, and its quiet homeliness.

England is now transformed by engineers. People who knew it well a hundred, or even fifty years ago, would not now be able to find their way about among railways, tunnels, viaducts, hills cut down, roads levelled up, coal mines, ship canals, crystal palaces, and a thousand other works of public utility, if not always of beauty. The system of travelling, which has given Londoners what they persist in calling the Underground Railway, has been carried further by the Electric Line, which whirls the passenger from the centre of the city almost into the green fields of the country without smoke or steam or noise. The possibility of tunnelling even the channel has been demonstrated by the Mersey Tunnel which connects Liverpool and Birkenhead, and by the still more marvellous Severn Tunnel, 7,664 yards in length, which connects Gloucestershire and South Wales. The Thames Tunnel, already mentioned, from Wapping to Rotherhithe, used to be looked upon as a kind of eighth wonder of the world. Such is the progress of engineering science that Mr. Barlow in 1869, in a few months made the Tower Subway for £16,000. Quite as remarkable in their way are such structures as the Saltash Viaduct near Plymouth, the Boyne Viaduct in Ireland, the so-called bridge at Runcorn, near Liverpool, which is two miles long,


EUROPE
English Miles
ARCTIC OCEAN
ATLANTIC OCEAN
MEDITERRANEAN SEA
AFRICA
TURKEY IN ASIA
MALTA
Long. W. of Greenwich
Long. E. of Greenwich

the Conway and Menai tubular bridges. The last-named cost £600,000; it is 103 feet above high watermark, and is 1,500 feet long. Four years were spent on it, and it was opened in 1850. Another great viaduct, on a different principle, spans the Firth of Forth from Queensferry to Fife. It is scarcely yet quite complete, but is recognised as the longest bridge in the world. It is on a principle which has been used for centuries by the Chinese and Japanese, and even occasionally in India. This is briefly the use of brackets. It sounds better to call it "the cantilever system," and this last name is pretty generally adopted. The islet of Inchgarvie was about half way across the firth which had to be spanned, and Sir John Fowler and his coadjutor, Mr. Baker, took advantage of the islet for their chief support. The railway which crosses the arm of the sea is 152 feet above high watermark, there are two spans of 1,700 feet each, two of 675 feet, and fifteen for the approaches of about 168 feet each. This is not quite so great a work as the Tay Bridge, but the Tay Bridge was a failure, whereas, the Forth Bridge, so far, looks like a success. The Tay Bridge was 20,780 feet long, being the longest then or since in the world. It was completed in 1878, and cost £400,000. However, in a terrific gale on 28th December, 1879, it disappeared in the sea, with the train which had been crossing it at the time. No passenger survived to tell the tale. The Railway Company immediately commenced the construction of another bridge a little higher up. The Tower Bridge, mentioned above, is not yet complete. It will consist of a drawbridge which can be raised in five minutes, with a footway overhead 200 feet above the Thames. Sir Horace Jones designed the towers, and Mr. Barry is the engineer.

I have not attempted anything like an enumeration of either the beauties or the wonders of "the old country." It abounds everywhere in objects of interest. The great diocesan cathedrals are sometimes rivalled in our minds by the modest parish churches in which our forefathers worshipped, and which, perhaps, are paved with their tombstones. The beautiful parks which everywhere abound, with their noble palaces, always, if interesting, open on "show days" to the tourist, are another unfailing attraction. The visitor from the Antipodes will encounter everywhere the marks of the efforts of his race in each branch of human progress, and recognising the source from which he has derived that civilization and freedom, civil and religious, which he enjoys in the Greater Britain beyond the sea, he learns to sympathise with his kindred "at home" under those difficulties attaching to the old society, which it is so important for the unity of the Empire that Colonists should understand. For, as the poet sang more than sixty years ago,—and his words are far more true now—

"It is the land that freemen till,
That sober-suited Freedom chose,
The land, where girt with friends or foes
The man may speak the thing he will;

A land of settled government,
A land of old and just renown,
Where Freedom broadens slowly down
From precedent to precedent."

CHAPTER III.

FROM LONDON TO GIBRALTAR.

BARKING.—EASTBURY.—TILBURY DEEP WATER DOCKS.—TILBURY FORT.—THE NORE.—THE CHANNEL.—FIGHTS IN THE CHANNEL.—THE BAY OF BISCAY.—THE COAST OF PORTUGAL.—BATTLE OF CAPE ST. VINCENT.—BATTLE OF TRAFALGAR.—TANGIER.—GIBRALTAR.—GRENADA.—SEVILLE.

THE route both out and home of the Orient steamers is through the Mediterranean and the Suez Canal, with brief stoppages at Gibraltar, Naples, and sometimes Algiers, so that much of the interest of the voyage consists in the places sighted or visited. At some of these it is well worth while for travellers not pressed for time to remain for the interval between two or more steamers. We propose, therefore, to give what may be found a sufficient itinerary of all routes followed by the Orient steamers, and to mention several places which may easily be visited from the ports at which we call.

The voyage may be said to begin when, having left the docks, the big ship answers to the first turn of the screw, and enters the Lower Thames at Gravesend Reach. The traveller, coming from London by train, has little time on the way between Fenchurch Street and Tilbury, by train, to survey the rich pastures behind the tidal embankment, where cattle and sheep are fattened for the London market with such succulent grasses, that as much as £6 or £7 rent per acre has been paid for the right of grazing.

There is little else on the way to attract the eye. At Barking there is an old church, with a fine tower, but we see no remains of the famous abbey, though some fragments still exist. Barking Abbey was founded by Erkenwald, bishop of London, about the year 670, who made his sister, Ethelburga, the first abbess. The Lady Abbesses of Barking in after times ranked as peeresses of the realm. When Henry VIII. suppressed the monastic houses, Barking was valued at something over £1,000 a year, equal to at least twenty times as much now. The site of the abbey is a market garden. A little further on, but on our

left, is a fine old red brick manor house, called Eastbury. Lord Monteagle was owner of this house when he received the famous letter which led to the discovery of the gunpowder plot.

At Grays, properly Gray's Thurrock, we obtain a fine view of the Thames, with Greenhithe and Northfleet on the opposite side. Several training ships may be observed moored at intervals along the bank, and the strange looking hospital formed of huts on the deck of the unsuccessful double channel steamer, *Castalia*. In a few minutes more we are at Tilbury.

The Tilbury Deep Water Docks, which the largest ships of the Orient Line can enter at any state of the tide, are among the most colossal undertakings of the day. They were opened for ships on 17th April, 1886, by Mr. Dobree, the chairman of the East and West India Dock Company, having been a little more than four years in course of construction. The tidal basin, which forms one of the chief features of the dock, has an area of 19 acres, and a depth at low water spring tides of 26 feet. In the basin are two quays, each 600 feet long, and a coaling jetty with moveable hydraulic cranes. A shed on the south side accommodates passengers, and opens on the railway station. Locks 80 feet wide, and 700 feet long, lead to the main dock. The gates are each 49 feet in width, and weigh about 240 tons. They are opened and closed by hydraulic machinery. Four dry docks are provided, large enough for any ship, and the water can be pumped out to the amount of 12,000,000 gallons in an hour. The pumping house where this operation is performed contains four centrifugal pumps of sufficient capacity to raise 650 tons of water per minute. This engine and the hydraulic engine by which all the hydraulic machinery is worked, are on a gigantic scale, as are the hydraulic travelling cranes, which are 61 in number, and simplify amazingly the task of loading or unloading. Each crane can lift 30 cwt. at the rate of 180 feet per minute, and can swing the full load round the complete circle in 40 seconds. But the floating steam crane seems to be the greatest of all the marvels to be seen here. It is aptly called "the Leviathan." The crane is mounted on a floating stage or vessel 110 feet long, and resembles what are called shears. It is designed to lift and swing 50 tons at 25 feet, or 45 tons at 30 feet, and is capable of placing masts over 100 feet high in a ship of 50 feet beam. The crane revolves, and is controlled by one man from one spot under the direction of the captain. The floating crane can be run alongside a ship lying at her berth and can take out or put on board heavy machinery or guns, while the ordinary operations of loading or discharging the ship are going on from the quay.

Tilbury Fort is beyond the railway station, and bears monumental witness of England's determination to keep out the invader. The gate was built from a design

by Wren, under the directions of Samuel Pepys, the diarist, in 1672. The chapel is as old as the time of Queen Elizabeth, who, it will be remembered, reviewed her troops at Tilbury in 1588. As the steamer turns out of Gravesend into Lower Hope Reach, on the right and left will be seen the low-lying, effective modern fortifications that command this entrance to the Port of London. Guided through the Lower Hope by the Mucking Lighthouse, which stands at the northern end, the steamship next enters Sea Reach, on the north side of which are the ruins of Hadleigh Castle, picturesquely situated on the summit of a hill. The ancient church of Leigh with its square tower is also very conspicuous.

Soon on either hand the land recedes, and by the time the long pier and villa-studded shore of Southend are passed on the left, the mouth of the Medway river appears on the right hand, guarded by the fortifications of Sheerness and Isle of Grain. A lightship marks the Nore or New Weir, which is mentioned as far back as the time of the Norman Conquest as being in the Medway, and marks the limits of the Thames Conservancy. From this point we are out of the river. Further inland, the heights of Chatham tower over one of the most important of our national dockyards. Shoeburyness, a low point forming the north point of entrance to the Thames, is seen on the left. Here are large Government works for testing great guns, the extensive Maplin Sands which lie eastward of the Ness affording great facilities, and being buoyed off for artillery ranges. On the right, in the distance, is the Isle of Sheppey and the coast of Kent, with Herne Bay, and "the Reculvers," two towers on a low earth cliff, being all that now remains of what was an important military station in the time of the Romans. The chalk cliffs which form the coast line of the North Foreland now begin; Westgate and Margate are passed, and the Foreland, well marked by the conspicuous octagonal lighthouse on the high land, and the Moro Castle on the edge of the cliff having been rounded, the substantial piers and handsome granite lighthouse of Ramsgate will now be seen. The course then lies through the Gull Stream, the passage between the coast and the Goodwin Sands. If it is low water "this very dangerous flat and fatal, where the carcases of many a tall ship lie buried," will be plainly seen from the lofty deck of the Orient Steamer. The Downs, a well-known anchorage, with Deal and Walmer are passed; the South Foreland and Dover, with its cliffs and castle, are next rounded, and the steamer fairly enters the English Channel.

The first point sighted is the remarkable shingly flat of Dungeness, with its conspicuous lighthouse. This is succeeded by the high down of Fairlight, under which lie Hastings and St. Leonards. The well-known and remarkable promontory of Beachy Head, with its lighthouse and seven white cliffs named the

Seven Sisters, are next passed. Eastbourne lies at the foot of the Head, while to the westward are Newhaven, Brighton (the Sea-London), Worthing, Littlehampton, and a long succession of watering-places. Next, the picturesque outline of the Isle of Wight rises boldly to protect the anchorage of Spithead, Portsmouth, with its dock-yard, Southampton, with its steamer trade, and Cowes and the Solent, the centre of the yachting world. Passing Bonchurch and Ventnor, basking in the sunny "chines" of the Undercliff, with St. Catherine's Point and lighthouse, we see the Isle of Wight terminate westward in the chalk "Needles," and the steamer, with a distant view of Bournemouth and St. Alban's Head, steers towards the curious peninsula called Portland Bill. Here a mass of rock, rising like Gibraltar, is connected with the mainland by an isthmus of shingle, cast up by the western drift; a breakwater, constructed parallel with this isthmus, forms the important and extensive refuge-harbour of Portland. Off Portland there is a great meeting of tides over an uneven bottom, causing strong eddies. This is known as Portland Race, and in tempestuous weather, when wind and tide are opposed, the agitation is so violent as to render the Race dangerous to small vessels.

From Portland a bee-line is taken across the West Bay, to the Start promontory and lighthouse. Northward of this headland lies Torquay, and the picturesque entrance to the Dart. Following along this magnificent rocky coast to the north-west, the steamer enters Plymouth Sound.

The historical associations of Plymouth include the story of the defeat of the Spanish Armada, that grand vindication of national independence and liberty, civil and religious. These memories of our sea-fathers, Drake, Hawkins, and Frobisher, carry us back to the days of discovery, and the foundation of the British colonies. The *Mayflower*, leaving Southampton in August, 1620, after putting into Dartmouth, finally sailed from Plymouth on the 6th September, to found New Plymouth, in America. From Plymouth, Cook and Vancouver sailed, to give England New South Wales in the East, and British Columbia in the West. The famous harbour of Plymouth thus well claims the title of the cradle of Britain's Colonial Empire; and voyagers may do worse than sojourn for a few days in this neighbourhood. The locality abounds in objects of interest and beauty. Anchored in the Sound, the ship seems to lie in the middle of a magnificent natural amphitheatre, closed to seaward by the great breakwater. The scenery of the Hamoaze estuary and of the meandering Tamar and Plym are backed by the hanging woods of Mount Edgcumbe, and the higher moorlands of Devon and Cornwall. The harbour and dockyard are for extent and for variety of work unsurpassed by any in the world. It is not difficult to obtain admission to most portions of the Government works.

But, strange to say, the visitor who only looks at Plymouth from the sea has not, properly speaking, any view of the old port which is so intimately connected with our history. Before the breakwater was built it was impossible for small ships —and all ships in those days were small, in comparison with the mighty mail steamers of to-day—to ride at anchor in the Sound, except in certain winds, and even then only when the great Atlantic rollers did not chance to be coming that way. Instead, then, of lying where we lie at anchor, they made their way, if they were men-of-war, to the left, towards the land-locked Hamoaze; or, if they were merchant ships, to the right, and, by a passage called the Cattwater, into Sutton Pool, the old port, behind the hill of which the Hoe is the side toward the Sound. Knowing this, the visitor will be able to descry the summits of some tall buildings which overtop the Hoe, and reveal to him where the Plymouth of history lies concealed. At present it is chiefly occupied by fishing boats, but is worth a visit, especially as it abounds in ancient houses, and other curious buildings, among which the old fort is not the least picturesque, with its gateway, a good example of the time of Charles II. The new Town Hall is a large building, by Messrs. Norman & Hine, and although architecturally very poor, it is said locally to rival in size, beauty of finish, and general result, the great Stadt Houses of the Netherlands. The comparison is damaging, but, unquestionably, the good Plymouth folk have done their best to secure a worthy edifice. It was finished in 1872. The old church and some houses near it are also interesting. Plymouth is one of the few places which boasts of a church dedicated to King Charles I., the parish of Charles having been separated from St. Andrew's in 1642, and the church built in 1659. Other examples of this dedication are in Derbyshire, at Falmouth, and in Shropshire. "The Three Towns," as they are called, Devonport, Stonehouse, and Plymouth, contain over 200,000 inhabitants. It may be worth noting as we pass out that the beautifully wooded hill on the west side of the Sound comprises Lord Mount Edgcumbe's famous seat. The house is on the north side, in a low situation, looking on the Hamoaze, and, it is understood, can only be inhabited in summer. The church of Maker is a conspicuous object on the summit of the hill. The two villages of Kingsand and Cawsand, in Cornwall, are the last we see of Old England.

As we emerge from the protection of the breakwater we can admire the great masses of stone of which it is constructed. The breakwater cost £2,000,000, and is just a mile in length. It was designed by Rennie & Whidby, and the first stone was laid in 1812. Some of the stones are as much as 35 tons in weight.

Ten miles from Plymouth Sound the Eddystone rocks are passed. Rising abruptly from the bottom, in the midst of deep water, they have long been known to

navigators. "A gentlemen of Essex, of a mechanical turn," began in 1696 to construct a lighthouse on these rocks. In four years this Mr. Winstanley completed his work; but three years afterwards, in a terrific storm, he and his lighthouse were washed away together. Four years later a new lighthouse was determined on and erected; it was composed chiefly of wood, and was destroyed by fire in 1755. In 1757 Smeaton began his great work, and for more than a century his well-constructed stone lighthouse had successfully withstood the buffeting of the waves; but, though sound in itself, the untiring sea had sapped its rocky foundations, and it has now been replaced by the new Eddystone lighthouse. The people of Plymouth have erected the old lighthouse on their magnificent marine promenade, the Hoe, where it stands in sight of its former triumphs, and in full view of its successor. The new light is 133 feet above the water, and has an illuminating power equal to 700 candles. The engineer was Mr. Douglass. The lighthouse was finished in 1882.

From Plymouth, the course steered is across the Chops of the Channel. On the right, the high moorlands and magnificent rocky coast of Cornwall are soon lost to sight. A hundred miles from Plymouth, and we are into the Bay of Biscay, which is held to begin when we pass Ushant, a lighthouse on an islet off the French coast. It is inhabited by fishermen, and is said to be the last foothold of heathenism in Europe. It was not converted to Christianity till some time in the seventeenth century.

Ushant and Cape Finisterra, in Spain, are the horns of the Bay of Biscay, and they are as many miles apart as there are days in the year. Into this hollow bay is perpetually driven the great westerly swell of the North Atlantic; the tides are strong, and the result is the tumult of waters that has given the bay its unenviable notoriety. Nevertheless, unless the wind be violent, the swell has little effect on the great powerful modern steamer, which carries the passenger in one day across the dreaded bay.

Passengers who have gained their "sea legs" are not without objects of interest in this part of the voyage. To some, the tireless sea, with its majestic succession of long rollers, is in itself most interesting. Others may like to reflect on the great historical events of which these waters have been the scene. In order to cater for both tastes, I venture to quote at some length, with permission, from the Hon. Ralph Abercromby's delightful volume on *Seas and Skies in Many Latitudes* (Stanford), and to subjoin a brief notice of some of the great naval battles fought here, prepared for me by Mr. David Hannay. It was during a voyage in one of the ships of this line that Mr. Abercromby made the following observations:—

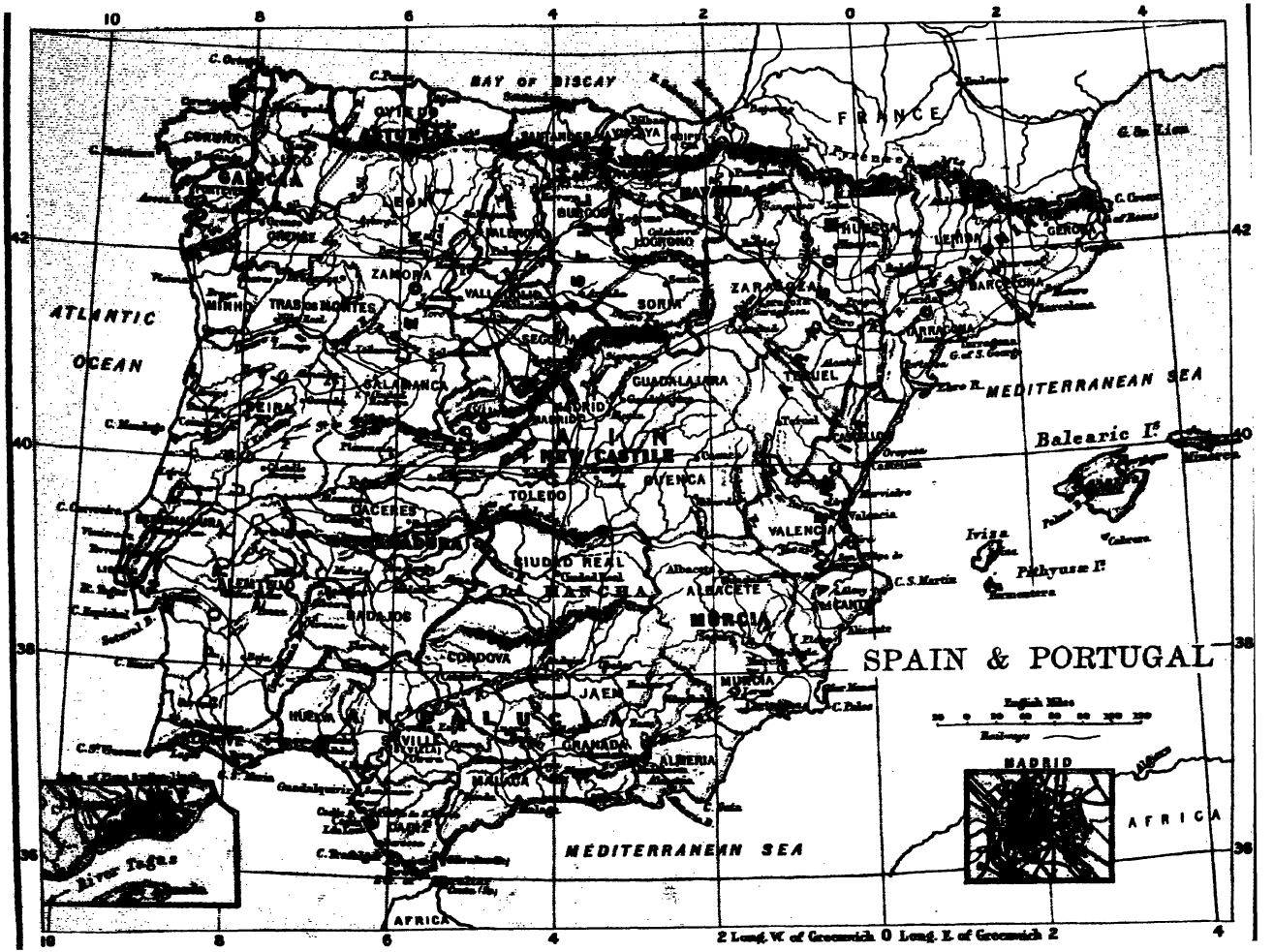
"It is a very curious thing how much the chain of mountains, which is called in its western portion the Pyrenees, in its centre the Alps, and in its eastern prolongations the Balkans, divides the system of weather that prevails in northern Europe from that which gives character to the Mediterranean Sea. The great cyclones which roll in a perpetual series from the Atlantic over Great Britain and Scandinavia, seldom extend their influence south of the Alps. On the other hand, the vicious little cyclones which form over the Mediterranean and work slowly towards the north-east, rarely surmount the mountain barrier that hedges them in on the north, but spend their fury in drawing down fierce blasts from the snowy ranges and then die out quietly over Italy or Turkey. But it is often asked, why is the Bay of Biscay so stormy that it has become proverbial and celebrated in Dibdin's song—

"As we lay, all that day,
In the Bay of Biscay O!"

This is a little difficult to explain without the use of charts, but it may be given broadly as follows:—First let us consider how far the Bay of Biscay is really rougher than the surrounding seas. As a matter of fact it is undoubtedly much rougher than the English Channel or North Sea on the one side, and more stormy than the coasts of Portugal on the other. But it is certainly no more disturbed than the west coast of Ireland, or than any part of the Atlantic between Valencia and the Banks of Newfoundland. Still, ships going from England to the Mediterranean or the West Indies, will usually find their passage across the bay the most disagreeable part of their voyage . . . More than three quarters of the weather of Western Europe depends on the arrival of ready formed cyclones from the Atlantic, whose future course depends on the distribution of pressure which they find prevailing on the Continent. When pressure is low over Scandinavia they (the cyclones) mostly pass to the north-east, and do not much affect the Bay of Biscay. But sometimes small cyclones form to the south of these northern storms, and meeting the high pressure which divides the Mediterranean weather system from that of Northern Europe, are arrested in their eastward course, and often hover about or brood over the bay for several days before their energy is exhausted."

When we are well into the Bay of Biscay there is hardly a mile which has not seen a naval fight. As far back as 1147 some Englishmen set sail from Dartmouth, in May, following much the same course as the Orient steamers follow, and, complaining of being becalmed for several days, reached the Tagus in time to turn the fortune of war against the Moors. This is our first recorded naval expedition.

Mr. Hannay says, "The route of the Orient steamers goes over those great naval battle grounds of England—the Channel and the Mediterranean. From the mouth of the Thames to the mouth of the Red Sea they pass by, and are often within sight of spots on which English fleets have fought victoriously, or, though only once or twice, have fought not so successfully. At Chatham, for instance, if one cared to remember it, the Dutch once burnt some of our ships, and, as Pepys has noted, the trumpeter of De Ruyter's flag ship blew 'Joan's placket is torn,' which was a kind of crowing and flapping of the wings habitual with the old seamen of all nations. Once out of the mouth of the river you enter on a stretch of salt water full of the memories of battles. Not very far to the left, as you go eastward, Blake defeated the Dutch under De Witt and De Ruyter on the 28th September, 1652. In the straits of Dover there has been much good fighting done. The defeat of the French under Eustace the Monk by the men of the Cinque Ports, in 1217, is ancient and obscure. It is not easy to know what either the ships or the tactics were like, though it is on record that the English luffed to gain, or at least to keep the weather gage, which seems to show that the seamanship of our mediæval ancestors was not so primitive and barbarous after all. The encounter between Blake and Tromp on the 20th May, 1652, which began the first Dutch War, is better known. Calais Sands have seen part of the two longest drawn out, and most vital pieces of sea fighting this nation has ever done. In 1588 the Spanish Armada came blundering into Calais roadstead after being plagued, and out-manœuvred, and bedevilled by Elizabeth's fleet. They were driven out by fire ships to their destruction in the northern seas. In February of 1653, Tromp came to an anchor there after the three days' fighting which began off Portland with Blake, Dean, and Monk. He being a better seaman than the Spaniard, and having a better fleet to command, slipped away quietly under cover of night, and brought the bulk of his ships safe home. Before getting into the Channel you leave on your right the scene of Blake's defeat by Tromp, in November, 1652. The English were overpowered by numbers, though some of them at least fought splendidly. This is what is commonly called the battle of the Ness, because it ended off Dungeness. Further on is Beachy Head, where Torrington, with a combined fleet of Dutch and English, was defeated by a greatly superior French force under Tourville in 1690. A great deal of exaggerated rhetoric has been expended on this affair, but it was a defeat, though by no means a disgraceful one. In mid channel, and to the left of an outward bound ship lies the scene of what is commonly called the battle of Cape La Hogue, but was once named the battle of Harfleur, where in May, 1692, Admiral Russell avenged Beachy Head. As you approach Brest the scenes of battles come thicker together, and 'off Ushant' there


SPAIN & PORTUGAL
BAY OF BISCAY
FRANCE
ATLANTIC OCEAN
MEDITERRANEAN SEA
Balearic Is
Iviza
Pithyusa Is
AFRICA
MADRID
River Tagus
GALICIA
ASTURIAS
LEON
OLD CASTILE
NEW CASTILE
ARAGON
CATALONIA
VALENCIA
MURCIA
ANDALUSIA
ESTREMADURA
PORTUGAL
ZAMORA
SALAMANCA
TOLEDO
CUENCA
GUADALAJARA
SORIA
TERUEL
BARCELONA
VALENCIA
ALICANTE
MURCIA
JAEN
GRANADA
ALMERIA
MALAGA
CORDOVA
BADAJOS
HUELVA
SEVILLE
CIUDAD REAL
ALBACETE
CACERES
2 Long. W. of Greenwich 0 Long. E. of Greenwich 2

has been much fighting. To watch French fleets at Brest and catch them if they came out was a standing duty with English seamen. and it inevitably happened that battles were often fought near the great French naval port. The, in some respects, unparalleled victory of Sir Edward Hawke, which we call the battle of Quiberon, and the French *la journée de l'ile de Conflans*, was gained over a fleet escaping from Brest. It was with the Brest fleet that Admiral Keppel fought his "battle off Ushant," in 1778—the battle which is chiefly memorable for giving rise to such a monstrous progeny of court martials and rabid naval quarrels. A very different battle off Ushant was the "glorious 1st of June" (1794), when Lord Howe after some days of manœuvring and partial engagement did at last succeed in smashing into the French fleet of Villaret Joyeuse, and completely defeating it. If this battle were remarkable for nothing else it would deserve to be remembered as having produced the most brazen and vivacious of historical lies—a lie so big, so picturesque, so brightly coloured, so absolutely baseless, that it becomes respectable as a work of art. This, it is almost needless to add is the story of the sinking of the *Vengeur*. Frenchmen believe to this day that the ship went down with tricolor flying, her crew shouting *Vive la Rèpublique*, and refusing to surrender; whereas in point of fact she had surrendered and was actually in possession of an English prize crew, and her captain, Renaud, was a prisoner on board H.M.S. *Culloden*, where Captain Schomberg was regaling him with cold meat pie when the *Vengeur* sank."

Soon Cape Ortegal and Cape Finisterra in Spain are sighted. Within, that is to the north-east of the frowning headlands of this corner of Spain, is the port of Corunna, called by English sailors the Groyn. It was here that after a victory Sir John Moore's death, in 1809, gave occasion for what some have designated the noblest ode in the English language—Wolfe's

"Not a drum was heard, not a funeral note."

It is curious to remark that astronomers reject the line

"By the struggling moonbeam's misty light,"

as there was no moon that night.

Within thirty-six hours of Plymouth a different climate has been entered: balmy warmth has replaced cold and bracing airs. Arosa and Vigo Bays are next passed, the mountainous land at the back, broken by cultivated valleys, forming a pleasant landscape. Oporto, the second city in Portugal, built upon the north bank of the Douro, about two miles from the sea, lies some eighty miles southward of Vigo. On the south side of the Douro, is Villa Nova da Gaya, the original town, formerly called

Calle; in it are the principal wine lodges and depôts: it formerly gave the name of *portus calle* to the port, from which it is said the present name of the kingdom of Portugal is derived. The well-known rocks, the Burlings, next attract the attention of the passenger, after which Cape Roca, the western point of Europe, will be passed with the Cintra mountains that rise just south of the cape, about 1,730 feet above the sea.

The view of Mafra, reputed the largest palace in the world, yet destitute of a single good room; with a monastery, now empty, a barrack, a school, a library, a university, and a hospital, all within its ample precincts, is well worth seeing, and is very visible with a glass from the sea. A little further on a village nestles among the vine-clad heights; high above it are Cintra and the Castle of Peñas, where the consort of the late Queen of Portugal spent his declining years. Beyond the blue hills is the site of Wellington's famous lines of Torres Vedras. Both the old Towers and the new (Novas) are still visible. A little further and we are abreast of the most western point of Europe, the Rock of Lisbon, or Cape Roca, and it is worth while, even in the calmest weather, to watch how the long Atlantic rollers break on the ruddy cliff, and seem as if they tried to creep up its rough face in vain. Behind are the beautiful gardens of Monte Serrato, the winter residence of Sir Francis Cook. The whole view, especially as seen at sunset, is described in the verses of Byron's *Childe Harold* (Canto I., 18, 19)—

"Lo! Cintra's glorious Eden intervenes
In variegated maze of mount and glen.

"The horrid crags by toppling convent crown'd,
The cork trees hoar that crown the shaggy steep,
The mountain-moss by scorching skies embrown'd,
The sunken glen, whose sunless shrubs must weep,
The tender azure of the unruffled deep,
The orange tints that gild the greenest bough,
The torrents that from cliff to valley leap,
The vine on high, the willow branch below
Mix'd in one mighty scene with varied beauty glow."

Off this coast the marine zoologist, if he keeps a good look out, may have his eyes gratified by the sight of an occasional flying fish (*Exocœtus evolans*), as well as the thunny (*Scomber thynnus*), and also dolphins, and occasionally the "blow" of a stray whale or two. A little further south, after we have passed Cape St. Vincent, the nautilus (*Acalepha pelagica*), called by the sailors the "Portuguese man o' war," may be met, looking like an alighting tern with his white wings shining on the blue surface of the water; and if the day be warm, what appear at a distance to be small floating barrels, but are really turtles (*Chalonia caretta*) basking in the sun, and rapidly disappearing when they hear the splash of the passing steamer. Scarcely

less interesting are the many-coloured pilot and fishing boats, which are chiefly to be seen at the mouth of the Tagus.

Here we catch a glimpse of the white towers of Lisbon, the fort of St. George bounding the distant view. On a very clear day the castle and church of Belem (Bethlehem) may be descried behind the circular ironclad islet which defends the port. The famous Convention of Cintra was signed by Sir Hew Dalrymple at Lisbon in 1808. Wellington had nothing to do with it; and the room shown to the traveller at Cintra with a blot of ink on the table is fictitious.

The land recedes when Lisbon is passed, but we can make out the curiously stratified cliffs of Cape Espichel, crowned by its lofty lighthouse. A little to the eastward is the old town of Setubal, a name which has been alternately Phœnician, Roman, Moorish, and Portuguese. The district is famous for its oranges, of which, indeed, it is sometimes said to be the original home; and in the east the popular name for oranges is Bordowan, that is, Portuguese. The lower coast adjoining on the south forms the province known as the Kingdom of the Algarves (Arabic *Al Gharb*, "the West"). Cape St. Vincent is soon sighted, a bluff 200 feet high projecting boldly into the Atlantic. On the top is a deserted convent, and the lighthouse is close by. The signal station of Sagres is just round the corner.

Nelson recurs to memory, capturing the *San Josef* and the *San Nicolas* in Lord St. Vincent's signal victory in 1797, of which Mr. Hannay supplies the following account:—

"The battle of, or off, Cape St. Vincent came at a fortunate time for England. In 1797 the victories of the French armies had turned our allies of the continent against us and welded them into a naval coalition for our ruin. Worse than the loss of the half-hearted and inefficient allies were the Jacobin agitation at home and the famous mutinies at Spithead and the Nore. We had been compelled to evacuate the Mediterranean. There was a distinct feeling of depression in England. At that moment the victory of Sir John Jervis came to revive the national hopes and demonstrate the irresistible superiority of the English fleet over the enemies it had to deal with. The traveller who passes Cape St. Vincent goes by the scene of perhaps the most timely naval victory if not the most glorious we ever won.

"The two fleets had tidings of one another some days before they met. An American trader who had seen Jervis's squadron in the Tagus, passed through the Spanish fleet, and gave Córdova the news that the English Admiral had only eight sail with him, which was true enough at the time. This report gave Don José de Córdova a fatal confidence and made him all the more lax about keeping his ill-manned and ill-disciplined fleet in order. Sir John Jervis learnt that the Spaniards were at sea

from Commodore Horatio Nelson, who had just come back from an expedition to withdraw the English garrison from Elba. On his way he had fought with, and had taken a Spanish frigate, and had been chased by the line of battle ships through the Straits. The English fleet held on its way in two divisions, and in close order, with a full knowledge of what was before it. During the night of the 13th February, a Portuguese frigate, the *Carlotta*, commanded by a Scotchman of the name of Campbell, brought Sir John Jervis news that the Spaniards were five leagues to windward of him. All night the English kept a sharp look out for the enemy without sighting him, though from time to time the wind brought down the sound of the guns Don José de Córdova fired as signals to his ships. Before dark on the 13th, the Spanish look-out frigates had sighted the English—and had mistaken them for a convoy. Don José and his fleet straggled on through the night before the south-westerly winds, anxious only to get back to Cadiz, and in utter ignorance of the approach of an enemy. So the enemies drew closer together in the darkness. On one side there was discipline and alert knowledge; on the other ignorance and supine confidence.

"When day broke on the 14th February, 'the most glorious Valentine's Day,' this was the position of the fleets. The English were in two divisions and in close order, eight leagues to the west and a little to the south of Cape St. Vincent, standing to the south. The Spaniards were straggling across their path in two disorderly shoals—one, the smaller, consisting of six ships, one three-decker, and five two-deckers, was nearer to the land; the other, containing one four-decker, five three-deckers, and thirteen two-decked ships, was further out to sea.

"The English line of fifteen ships, headed by a man well entitled to lead even a fleet containing Nelson and Collingwood, bore straight on the gap in the Spanish line. When it became clear that a battle was imminent, the Spaniards made a desperate attempt to bring their line into some sort of order. The smaller or lee division of them, which was nearer the land, came round from before the wind to the starboard-tack, and instead of heading eastward towards Cadiz, turned to south or west towards the sea, with the intention of rejoining the bulk of their fleet. From east, west, and north the three squadrons, the two Spaniards and the one English, raced for the same spot. The Spaniards aimed at it because they wished to come together again, and the English because they wished to keep their enemy divided. It was the English who won, and at half-past eleven the *Culloden*, being then ahead of the leading ship of the Spanish weather or westerly half, opened fire with her starboard broadside. About this time two three-deckers and one two-decker of the larger or westerly Spanish swarm succeeded in stretching across the head of the English

line, and joining the smaller division to leeward. Thus the English line found itself with sixteen enemies on one side and nine on the other. The real battle was between the sixteen Spanish ships to windward and the English fifteen. The larger Spanish swarm, to windward of our ships on the starboard and to leeward of our ships on the port tack, were in the angle. They were between two fires with their heads in chancery, so to speak, and were being terribly pummelled. Just then the easterly Spanish division, the smaller one, on the port side of the main English line, made its only serious effort to take part in the battle. Headed by the *Principe de Asturias*, a big three decker, this swarm tried to pass across the bows of the *Victory*, and rejoin their comrades to windward. The manœuvre was more gallantly designed than executed. The *Principe de Asturias* came right under the lee of the *Victory*, and received a raking broadside which sent her flying round in wild confusion. Then the rest of that division gave up the attempt to cut the English line and practically took no further part in the battle, with the exception of the *Oriente*, 74, which ran down the port side of the English ships, and, passing astern to the east of them, succeeded finally in rejoining the windward Spanish division.

"Meanwhile, the bulk of the Spaniards who were in the angle and in chancery made an effort to get out. They endeavoured to repeat the manœuvre of the *Oriente* in the opposite direction, to run down the starboard side of the English ships behind Jervis, to pass astern of the last of them, and rejoin their own vessels to leeward. This manœuvre, if successful, would have reduced the battle to a passing cannonade, and have put the Spaniards where the road to Cadiz was clear before them. Here was Nelson's chance, and he took it. He struck in after a fashion which made the victory decisive. Seeing that the Spaniards must be stopped, he, without waiting for orders, and acting on the general spirit of Sir John Jervis's directions, wore his ship out of the line, went round the *Diadem*, the 64 astern of him, and ahead of the *Excellent*, hauled up on the port tack, and threw his vessel right across the path of the mighty *Santisima Trinidad*, and the Spanish three-deckers. This manœuvre, which was followed by the *Excellent*, the *Diadem*, and other ships on signal from the *Victory*, turned the English line into a pair of pincers, of which the points were the *Culloden* and the *Captain*. In this dreadful grip the Spaniards were caught tight. All attempt on their part to continue a regular battle was given up. They fled away seaward in disorder, with the English sticking to them, and capturing the laggards."

Cape St. Vincent passed, the cry is "Eastward Ho!" and the course is shaped for the Straits of Gibraltar. Cape Trafalgar, low and sandy with a dangerous shoal lying off it, is next passed with the stirring memory of the great sea-captain's last battle, fought in 1805—in every way the greatest of naval battles. At Waterloo we

fought for victory, but at Trafalgar the struggle was for existence. Mr. David Hannay supplies the following particulars of this great fight:—

"The greatest sea fight in the history of the world, the last which was fought with the old sailing fleet, took place, as all the world knows, off Cape Trafalgar on the 21st October, 1805. It would neither be appropriate nor even possible to give here as much as the most meagre outline of the long series of movements which brought the English and the combined fleets into contact on that great day. We must confine ourselves to the actual meeting. At day-break on the 21st then, the combined French and Spanish fleets were sailing in three lines for the Straits of Gibraltar when they sighted the English to westward and windward of them. As a battle was now inevitable, Admiral Villeneuve ordered his three lines to form in one formation, for they can hardly be said to have formed a line. He also ordered them to wear to the north so as to head towards their harbour of refuge, Cadiz. They were then off Cape Trafalgar at a distance of about ten miles, with the English fleet about another ten miles off them to the north of west. Admiral Villeneuve's fleet consisted of 33 vessels in all, of which 15 were Spaniards and 18 were French. When after a good deal of difficulty they were at last formed in order they presented the appearance of a crescent lying almost due north and south with its convex side swelling out to the east. They were not in a single line abreast, but in a species of double line, and either by accident or design, the inner vessels were opposite the spaces between the outer, so that the whole formation seemed to Admiral Collingwood to be a chequer. The space between the ships was about a cable's length (200 yards) so that the whole fleet covered a line nearly five miles long. French and Spaniards were mixed together. The English fleet consisted of fourteen ships in all, making, with the weather division, twenty-six sail of the line, accompanied by four frigates, a schooner, and a cutter.

"Nelson's plan of battle, which was in the main carried out, was that the lee division, headed by Collingwood, should break through the enemy's line at about the twelfth ship from the rear, while he himself broke through it a little in advance of the centre vessels. Then both divisions were to come to the wind on the lee side of the enemy. In this way a section of his line would be taken between two fires, and his rear, being to leeward, would be unable to succour the van before it was crushed. It was an adaptation, in fact, of the plan of battle of the Nile—an application of the 'Nelson touch.' We say the plan was carried out in the main, because, as a matter of course, the whole of the two English lines never came into action at all, and so the enemy was not crushed by having the bulk of our force thrown upon him. The wind was very light all through the battle, and at times

fell to a dead calm. As the English came down perpendicularly, or very nearly so, to the crescent of the French and Spaniards, the vans of their lines came into action much before the rear. It was upon them that the brunt of the battle fell, and, indeed, the rear ships of the English lines were not able to come up till the fighting was practically over. The *Prince*, 98, which was the rear ship of Collingwood's line, did not lose a single man killed or wounded. Of the total loss of 1,690 men suffered by the whole fleet, very much the greater part fell upon fourteen out of the twenty-six vessels. Still these were enough to do the work. Collingwood cut the enemy's line astern of the *Santa Ana*, very shortly after midday. Ten minutes, or a quarter of an hour afterwards, Nelson cut it astern of the *Bucentaure*. They and the ships immediately following them proved sufficient to ruin the enemy's centre, and shatter the rear. His van took no part in the battle, but remained still at the head of the line, till Rear-Admiral Dumanoir le Pelley thought it was time to be off. The actual fighting was over by five o'clock, or very shortly after it.

"Who has not heard how Nelson, when the last order was given, and the fleet was slowly bearing down on the enemy, entered his cabin, and penned his last prayer? Who has not heard of the strange legacy he left his country, of that appeal for Emma Hamilton, which he made in the innocence of his heart, so pathetically, and not the less pathetically because a little absurdly? The rest of the story is wholly noble. There is not much more touching in the history of war than the last parting with Captain Blackwood, of the *Euryalus* frigate. Nelson went into the battle with a distinct conviction that he would not survive, and he said good-bye for ever to his old friend, as the captain of the *Euryalus* went over the side to return to his frigate. 'God bless you, Blackwood, I shall never speak to you again,' these were the words of a man who felt he was going to his death, and to whom, perhaps, death was not unwelcome. Every school boy knows, or ought to know, the famous sayings of the two chiefs. 'What would Nelson give to be here,' said Collingwood, to his Flag-Captain Rotherham, as the *Royal Sovereign* passed astern of the *Santa Ana*, pouring in a broadside, which swept down four hundred of the Spaniard's crew, and dismounted twenty of his guns. 'See how nobly Collingwood leads his line into action' were Nelson's words to Hardy, as they, still at some distance from the French line, stood looking at the *Royal Sovereign* leading the lee division into battle. The Elizabethans could have imagined nothing finer. The death of the Admiral is in everybody's memory. Most, probably, of those who read this page have seen the very spot on which he fell, shot from the tops of the *Redoutable*, while walking to and fro in the thick cloud of smoke and dust from the shattered timbers of the *Bucentaure*, which covered the quarter deck of the *Victory*. They have seen, too,

the cockpit to which he was carried, mortally wounded, and in which he died, murmuring, 'I have done my duty: I thank God for it.' It was the most noble and desirable of deaths. No chief ever died in such a fulness of glory and perfection of triumph. His work was done. Had he lived longer, it must have been in idleness, and most probably in blindness, with one beside him who would have stained his life with an ignoble touch. It was a thousand times better to die in the *Victory's* cockpit.

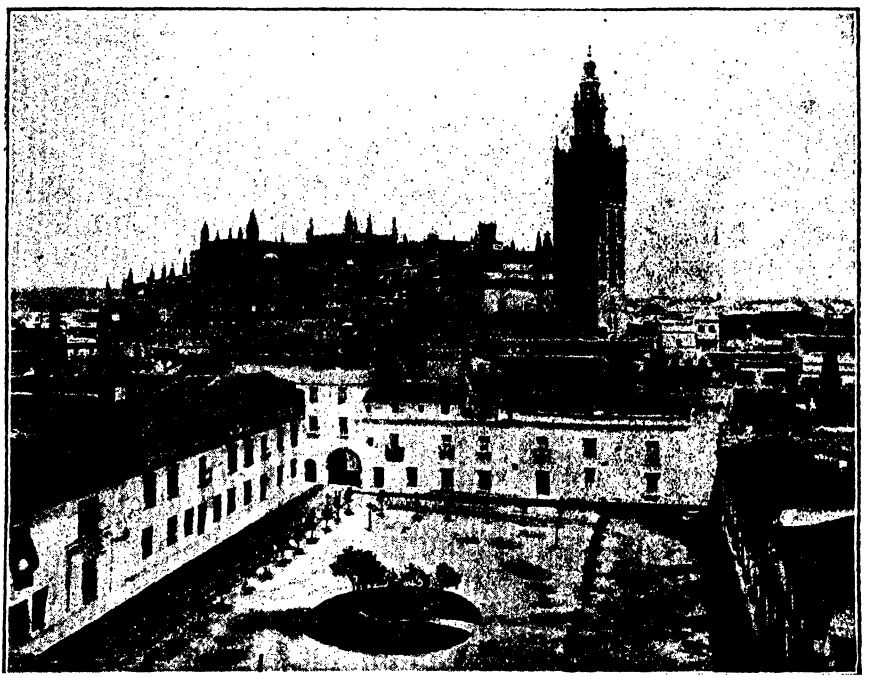
"Trafalgar was the last great battle fought under sail—the finish and heroic winding up of centuries of valour, effort, and discipline. The waters on which it fought its last and crowning fight should be holy to Englishmen. There is not one of them who has not good cause to be grateful to this day for Trafalgar."

About fourteen miles to the east of Cape Spartel, the north-western corner of Africa, is the town of Tangiers, or Tangier, the favourite resort of excursionists from Gibraltar. The town standing on two eminences at the north-west extremity of a spacious bay makes a fine view from the sea. Tangier belongs to Morocco, but was at one time a British possession, having been ceded to Charles II. as the dowry of his queen, Katharine of Braganza, by the Portuguese. The place was abandoned in 1683. There are views of Tangier by Wenceslaus Hollar, the great engraver, and it may interest some to know that good Bishop Ken was chaplain of the garrison. Sir Lambert Playfair says of Tangier, in his *Handbook to the Mediterranean*, that a stranger who has not been in the east will find the first view of it very striking. "Although Europe has been left behind but a few short hours, he finds himself transported into a city as oriental as a page of the *Thousand and One Nights*. A convenient pier of recent construction enables him to land in comfort, but one is almost tempted to regret the picturesque but very disagreeable method formerly in force of being carried ashore on the backs of brawny but unclean Jews." The streets are paved in the roughest manner with round stones, painfully tiring to the feet, and slippery even in dry weather, but after rain it is almost impossible to keep one's footing. However, donkeys and horses are to be had, only it is well to see that the saddles are secure, as a bath of Tangier mud is by no means desirable. It is soon easy to forget the discomfort of the streets in admiring the picturesque architecture and the exquisite contrasts made by the oriental dresses against such a background. Everywhere are mosaic tiles, not only beautiful in colour, but put together in the most marvellous variety of design. Through every doorway some fresh combination is to be seen, in horseshoe arches, steep staircases, and walls which here and there glow like mother-of-pearl in the shifting light. The streets are so narrow that it is quite easy to pass from roof to roof across them, though it would

who over-ran all northern Africa for the Caliph. The opposite cape is named Gebel Musa, in like manner, but the English sailor calls it Apes' Hill.

At Algeciras there has lately been opened a railway station whence travellers who land at Gibraltar can visit almost any part of Spain. For a long time the jealousy felt by the Spaniards at our occupation of the Rock they have found so impregnable prevented their permitting the railway to be completed. As a short stay at Gibraltar may enable a tourist who has leisure to visit some of the most interesting towns in southern Spain, I proceed to offer a few notes on such excursions. Gibraltar itself is more fully described in the next chapter. It has been, since 1704, in the possession of Great Britain. To the north, the sandy isthmus that separates it from Spain is dominated by a sheer precipice 1,330 feet high. In this are the celebrated galleries hewn within the rock, opening here and there in port holes which, with batteries in commanding positions about the rock, render it impregnable. The only landing is on the west side; but the garrison has hitherto successfully beaten off all attacks, including the persistent efforts of the French and Spaniards, who maintained a three years' siege in 1779-82. The signal station is 1,294 feet above the sea, and the highest point 1,408 feet. The Barbary ape is to be found on these summits; the only place in Europe where the wild monkey exists. In Gibraltar will probably be seen a greater variety of nationalities than in any other town in the world. The cantonments for the British troops are on the sandy isthmus to the north of the town. At Windmill Hill in 1867, some remarkable and extensive caves were opened, which have yielded a rich harvest of remains of extinct animals and also of "prehistoric man." In some of these the stalactites are superb.

From Gibraltar there are frequent steamers to Malaga, or the tourist can go by a roundabout route through enchanting scenery from Algeciras by train. Malaga is situated about seventy miles north-east of Gibraltar, and has not, apart from its surroundings, much attraction for the tourist; but there is an old Moorish castle in ruins on a hill which still bears the original Arabic name of Gibralfaro, "the mount of the lighthouse." The cathedral, too, is a Saracenic relic, having the ruins of a mosque built into its not very lovely walls. *Malaga* in Arabic would mean a "spoon," a reference, probably, to the shape of the valley in which the town stands. Some thirty or forty years ago it was a favourite English health resort, the climate in winter being, perhaps, the best in Europe Here we take the train for Granada, and every mile of the road is both interesting from its history, and beautiful scenery as well. We pass Antequera, with its Roman remains, the viaduct and cliffs of Salinas, Loja, Illora, where the estates of the Duke of Wellington are situated, and Elvira, with its sulphur baths, and reach Granada after a journey of about 150 miles, through "one



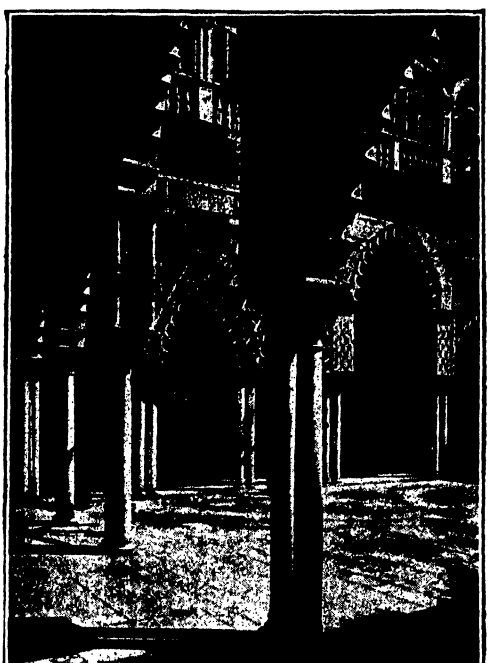
SEVILLE.

of the richest and most picturesque countries it is possible to imagine," as Sir Lambert Playfair says. The orange groves and the odour of orange flowers in spring will never be forgotten by the traveller.

Granada is situated beneath the great Sierra Nevada, but is on the average upwards of 2,000 feet above the level of the sea. The Alhambra towers above the town, on a high plateau. This famous palace and fortress was built between 1232 and 1272, by Ibn al Ahmar. As *Ahmar* means red, and as *hamra* is the feminine of that adjective, there may be something more than an accidental connection between the names, but the full Arabic term *Kelaat el Hamra*, the Red Castle, may refer to the colour of some of the principal towers.

From Algeciras, also, we can visit Seville and Cordova. Seville bears a very ancient name, which in Punic or Moorish would appear to mean "the plain." It is situated on the banks of the celebrated Guadalquivir (Arab. *Wady al Kebeer*, "the

great river"), and has the reputation of being extremely healthy. The early spring is the best time for a visit.



ALCAZAR, SEVILLE.

From Seville to Cordova, which is a little over ninety miles, forms a pleasant excursion if the weather is favourable, and if we do not linger too long at Seville. It is well worth while to have even a peep at the city of the Moors. All agree that there is no place in Spain which retains so much of the oriental air; and the Mosque, unlike that of Seville, has not been pulled down and rebuilt, but has been altered and adapted, and a choir built in the centre to fit it for Christian worship. The people, however, still call it "La Mezquita," a corruption of the Arabic "masgid," a mosque, and Cufic, or old Arabic, quotations from the Koran are still on the walls.

CHAPTER IV.

FROM GIBRALTAR TO NAPLES.

GIBRALTAR AS SEEN FROM THE SEA.—THE TOWN.—ITS HISTORY.—THE GREAT SIEGE.—THE APES.—THE GEOLOGY.—CAPE DE GATA.—ALGIERS.—SARDINIA.—THE BAY OF NAPLES.—VESUVIUS.—THE NAPLES MUSEUM.—POMPEII.—PÆSTUM.

THERE is something very attractive in the view of Gibraltar from the sea. The combination of high antiquity and the latest improvements in military engineering, of Mediterranean warmth with English neatness, of the sternness of warlike preparations and the gentleness of the mild breeze, the blue sky, the still bluer sea, and an exquisite landscape, with fold after fold of giant mountains fading away insensibly in the distance, is most fascinating.

As we steam up to an anchorage we can identify the chief sites of interest. At the southern extremity, which it should be mentioned, is not the most southern point of Europe, an honour which belongs to Tarifa, on a low spit of land is the lighthouse marking Europa Point. Then rising higher up the hill are endless rows of barracks interspersed with a few private houses, until the eye reaches the little tract of woodland which stands above this end of the town. All the buildings here are collectively known as "The South." Among the trees nestle a few villas, from which there is a lovely view. Above all rises the bare rock, to a height of 1,361 feet. Down by the water side great guns may be descried by keen eyes, and the harbour for men-of-war opens a little further on, at the New Mole. Then we come to the green Alameda, part of which is the cemetery of the soldiers killed in the great siege. In front, projecting slightly into the water, is "Jumper's Bastion," and north of it the Parade Ground. From this point a curious electric lift takes men and heavy loads up to the signal station. We now come to the town, one of the first houses being the so-called "Convent," where the governor resides. In the mass of irregular houses it is not very easy to distinguish it. Climbing the mountain side in a long zig-zag is the old Moorish wall defending what was then the southern limit of Gibraltar.

The old town is not very picturesque, but we get a good view of the Moorish Castle on a height above the northern extremity, and may try to judge for ourselves whether or no those obtusely pointed arches are the oldest in Europe, as is said. A castle was certainly built here by Abu-al-Hajez in 725. Far beyond the Castle we see the low isthmus which unites Gibraltar with Spain, and at the further side the Spanish lines, where there are a few houses, which constitute the town of Linea. The mountains rise in tiers until in the far distance, rather to the eastward, the snowy ridge of the Sierra Nevada may be made out.

The anchorage at Gibraltar is not good in a southerly breeze, and the ship heaves-to a long way from the shore. It is, however, well worth while to land and stroll through the market, which is close to the landing place, and the narrow winding streets of the old town. It takes longer to ascend to the famous galleries; but, if any stay is made at Gibraltar they should by no means be omitted. A drive along the road to The South is also very interesting, and the view across the Straits to "Apes' Hill" framed between the stone pines at the summit of the slope is well worth a little trouble. A longer time is required for a visit to the signal station, 1,294 feet above the sea, but it is worth the trouble if leave can be obtained.

Gibraltar was taken from the Moors by the Spaniards in 1462, after a long siege. In 1704 Sir George Rooke appeared in Gibraltar Bay with a fleet and summoned the governor, who had only 150 men under him, to surrender. On his refusal some troops were landed on the isthmus, but on the 23rd July, two days later, Captain Hicks and Captain Jumper landed on the New Mole, and after some fighting made good their hold by taking a redoubt, after which the Spanish Governor capitulated. In July, 1713, Gibraltar was formerly ceded; but the English had already sustained a desperate attack by both Spanish and French troops and ships. The great siege of Gibraltar, however, was begun in July, 1779, and went on for four years, with more or less intermission, General Eliott, afterwards Lord Heathfield, being the governor. The incidents of the siege are described in Drinkwater's well-known book; and we need only point out here that the great attack of the 13th September, 1782, was directed to the King's Bastion, where Eliott himself stood during the hottest of the fire. The galleries from which he was able to play with such effect on the Spanish lines are situated along the northern face of the rock; but there are many other excavations, some of them only known to a select few. In fact, the whole hill is honey-combed with hidden batteries.

The Rock of Gibraltar is the only place in Europe where the ape is to be found wild. A flock, carefully preserved, lives in the upper fastnesses of the rock, and is occasionally seen in the gardens on the lower slopes. They were at one time, it is

said, reduced to a dozen or so, but have lately increased in numbers, and there are now about sixty, according to a report sent by the Governor to the Zoological Society in 1893. They are of the same species as that on the coast of Barbary opposite, known to naturalists under the name of *Inuus ecaudatus*.

In Gibraltar will probably be seen a greater variety of nationalities than in any other town in the world. The cantonments for British troops are on the sandy isthmus to the north of the town, and there are numerous barracks everywhere. At Windmill Hill in 1867, some remarkable and extensive caves were opened, which have yielded a rich harvest of remains of extinct animals and also of prehistoric man. In some of them the stalactites are superb.

The lamented Professor Tyndall in his *Fragments of Science* (i. 217) said, "the promontory of Gibraltar is so burrowed with caverns that it has been called the Hill of Caves. They are apparently related to the geologic disturbances which the rock has undergone. The earliest of these is the tilting of the once horizontal strata. Suppose a force of torsion to act upon the promontory at its southern extremity near Europa Point, and suppose the rock to be of a partially yielding character, such a force would twist the strata into screw surfaces, the greatest amount of twisting being endured near the point of application of the force. Such a twisting the rock appears to have suffered; but instead of the twist fading gradually and uniformly off in passing from south to north, the want of uniformity in the material has produced lines of dislocation, where there are abrupt changes in the amount of twist. Thus at the northern end of the rock the dip to the west is 19°, in the Middle Hill it is 38°, in the South Hill or Sugar Loaf it is 57°. At the southern extremity of the Sugar Loaf the strata are vertical, while further south they actually turn over and dip to the east. The rock is thus divided into three sections, separated from each other by places of dislocation, where the strata are much wrenched and broken. These are called the Northern and Southern Quebrada, from the Spanish 'Tierra Quebrada,' or broken ground. It is at these places that the inland caves of Gibraltar are almost exclusively found." There is much more on the subject in Mr. Tyndall's book.

The Straits of Gibraltar are between Calpe (Gibraltar) and Abyla (Apes' Hill) the "Pillars of Hercules." These pillars are represented over a gateway with the arms of Charles V., and once bore the proud motto, *Plus ultra* ("there is more beyond"), whence the gate is known as the Ragged Staff.

When the steamer leaves Gibraltar she passes too far, as a rule, from the shore for Malaga to be sighted, but the Sierra Nevada is in view, and the fine coast line, full of colour. A hundred miles of steaming bring the ship to Cape de Gata, a rugged headland descending in declivities from the Sierra of the same name. This Cape has

an evil reputation among sailors: strong currents are experienced in the water, with sudden meetings of opposite winds in the air. These conflicts of winds, called *contrastes*, naturally raise a heavy sea, and at the equinoxes are often accompanied by thunder storms, violent squalls, and an occasional waterspout. Just west of Cape de Gata is the Spanish town of Almeria, the centre of one of the richest as well as most picturesque provinces of Spain. On the left, in the midst of the sea, is the small Spanish isle of Alboran, a resort of fishermen and smugglers, and even, it is rumoured, seafarers of a more lawless description.

The scenery while we are in sight of the coast of Almeria is very fine, though the absence of any commanding peak in the Sierra Nevada makes it difficult to believe that it is nearly 1,000 feet higher than Mount Etna. Vines and grey olive trees may account for a certain look of barrenness, less visible in the spring than in autumn, and the Sierra has always snow on its higher ridges. The chief wealth of Spain consists in its minerals, and we pass many small steamers bound with ores to Cardiff and other English ports. The African coast, meanwhile, comes plainly into sight on our right, and, being to the southward, often assumes a depth and intensity of blue to which we are hardly accustomed at home.

Ships of the line used often to call outward bound at Algiers. As we approach, the beauty of the view increases with every hour. This splendid coast was the scene of the first exploits of the Moslem hordes which in the seventh century overran nearly all Spain and Portugal. It is curious on the one hand to reflect that it formerly abounded with countless Christian cities and churches, and on the other to note the gradual and, of late years, rapid shrinking of the power of the formerly irresistible Mohammedan. At Malta the language is still largely Arabic, but mingled with Italian, and written in the Italian fashion. Here the natives speak a better dialect of Arabic than that of Cairo: but French is everywhere to be heard in the town. Nor is English unknown in the best shops and hotels, and the English colony is numerous and wealthy. The splendid system of quays was made by an English engineer and English contractors. The French can conquer, but are not good colonists, and many, or most of the fine villas which rise in such profusion on the verdant hills round Algiers are inhabited by English settlers, while the Maltese muster strongly in the streets.

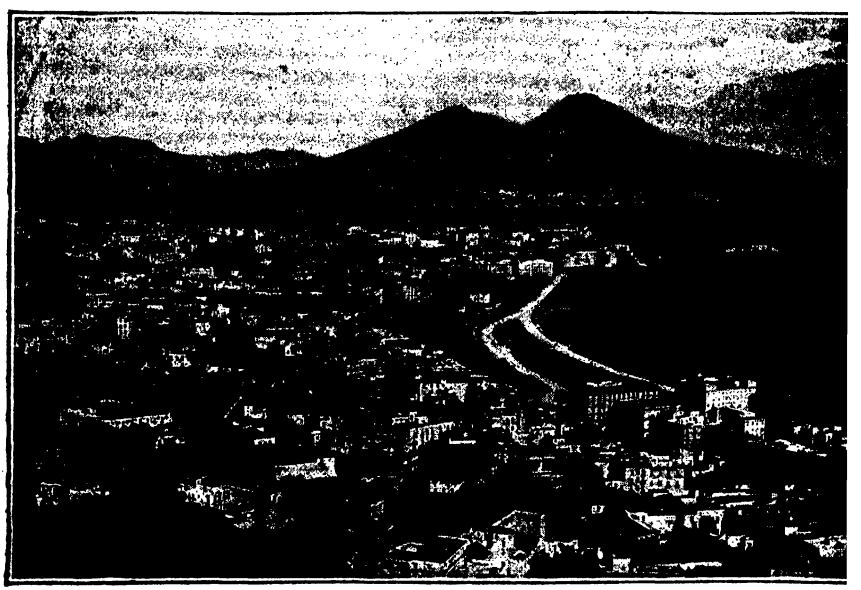
The situation is simply superb, the white buildings rising in terrace above terrace from the blue waters of the harbour. The best account of Algiers is to be found in Sir Lambert Playfair's *Handbook*, to which, as well as to his *Handbook of the Mediterranean*, we are greatly indebted in compiling these pages. The

population of Algiers is about 52,000. A large number of English people make it a regular winter residence, and others have houses and farms in the neighbourhood. The town faces to the eastward, and we pass the islet, now connected with the mainland of Peñon, and the ancient harbour, as we steam into our anchorage. Like Algeciras, opposite Gibraltar, the name is derived from *Al Jezireh*, the Arabic for "island." In 1530 Khair-al-Deen, or Khaireddin, took the Spanish fort on the island, and the place became the head-quarters of piracy, and a terror to the Christian nations. It seems odd while we admire the lovely view, to remember what terror the Algerine corsairs added to a voyage up the Mediterranean two centuries ago, and less; and to recollect that a part of the South Kensington Museum stands on land bequeathed by Alderman Smith to defray the expenses of releasing English slaves in Algiers. Khaireddin held as many as 30,000 Christians in captivity at one time. They built the causeway and the wall for him. The Dey, as the pasha was called, continued to be a terror down to the last. Lord Exmouth, in 1816, bombarded Algiers and released 3,000 Christian captives, but the old practices continued until the French, after an insult to their consul, whose face the Dey slapped, intervened, and finally, after a long and desultory siege, took possession of the place in July, 1830. It is now almost completely French, except in those parts of the old town which constitute the native quarter. Neither the French cathedral nor the Moslem mosques are worth visiting; but there are some interesting Roman antiquities in the Museum. The streets and lanes in the central or Arab quarter are, especially in sunny weather, extremely picturesque, and more attractive to a temporary visitor than any interior.

From Algiers we head a little to the north of east, and are soon in sight of the southern coast of Sardinia. It is high and rugged: Cape Teulada, the ancient *Chersonesus*, the most southern point, is a singularly formed headland, its cliffs rising precipitously 750 feet out of the sea. Westward of this cape lies Cape Spartivento, the ancient *Herculis Promontorium*, having passed which the Bay of Cagliari opens with the town, the *Caralis* of the Phœnicians, situated at its head. The town is walled, and the summit, elevated about 400 feet, is crowned by the citadel. After we pass Cape Carbonara, the coast of Sardinia becomes fainter and dies away at last in the western glow. We now head north-east for Naples, 240 miles distant.

If the land be made at night, one of the first objects seen will probably be the intermittent flame from Vesuvius, a good mark to steer for either by night or by day. Daylight will show the beautiful island of Ischia, the coast of which is rocky and precipitous. Ischia passed, Baiæ, the Brighton of old Rome, next opens, with its castle and ruined temples. Pozzuoli lies some two miles eastward of Baiæ from

which runs a mole constructed on the bridge of Caligula; the land at the back is volcanic, on which are the old craters of Monte Nuovo and Astroni. The steep rocky islet of Nisida and Cape Caraglia are next rounded, and the steamship enters the beautiful Bay of Naples, well deserving of all the praise that has been lavished upon it. Close off Cape Caraglia is Gajola Rock on which, and along the shore, both above and under water, are enormous ruins of every description. The coast is now studded with villas and dotted with gardens; the ruins of the castle of Queen Joanna and the grim prison of Castel' dell' Ovo



NAPLES.

stand out conspicuously: the Chiaja is marked by the long gardens of the Villa Reale. The city of Naples rises from the shore in the form of an amphitheatre divided into two unequal crescents by the hill of San Martino, crowning which rises the castle of St. Elmo. On the north rises the hill of Capodimonte on which stand the observatory and a royal palace. Large moles protect the Military and Grand Ports; from the latter the land sweeps round to the eastward, turning south to the foot of Vesuvius, near Torre del Annunziata. On this coast lie the small towns of Portici, Resina, and Torre del Greco. The first

named is built on the site of the buried Herculaneum. From Torre del Annunziata the coast runs first south to Castellamare and then sweeps round westward to Sorrento and the point of Campanella, three miles again to the westward of which lies the fertile and famous island of Capri, with its terraced bluffs. Capri completes the marvellous curve of beauty that bounds the Bay of Naples. Over Castellamare rises the mountain of St. Angelo, in the valley between which and Vesuvius, but nearer the volcano, are the ruins of Pompeii.

The Bay of Naples has been so often and so eloquently described that a visitor is very likely to be disappointed with it. When the slopes of Vesuvius are covered with snow and the streets of the city darkened with fog, or when there is a downpour of rain, with a heavy cloud hiding the mountains altogether, the unhappy traveller is naturally disenchanted. Such things do sometimes happen, and it is better, therefore, not to expect too much, and also to remember that the great size of the Bay of Naples renders it unlikely that all its beauties should be visible at one and the same time. Of course, lovely clear days do occur, and sometimes many of them in rapid succession: but we cannot always count upon good weather, and must be content with what we have.

By far the best account that I have met with of the Bay, its associations and its scenery, is to be found where we should least expect it, in a novel by Fenimore Cooper, the *Waterwitch*. Here is the whole passage:—

"Though many years are gone," he said, "I can recall the beauties of that scene as vividly as if they stood before the eye. Our abode was on the verge of the cliffs. In front lay the deep blue water, and on its further shore was a line of objects such as accident or design rarely assembles in one view. Fancy thyself, lady, at my side, and follow the curvature of the northern shore, as I trace the outline of that glorious scene. That high mountainous and ragged island on the extreme left is modern Ischia. Its origin is unknown, though piles of lava lie along its coast, which seems fresh as that thrown from the mountain yesterday. The long, low bit of land, insulated like its neighbour, is called Procida, a scion of ancient Greece. Its people still preserve in dress and speech, marks of their origin. The narrow strait conducts you to a high and naked bluff. That is the Misenum of old. Here Æneas came to land, and Rome held her fleets, and thence Pliny took the water, to get a nearer view of the labours of the volcano after its awakening from centuries of sleep. In the hollow of the ridge, between that naked bluff and the next swell of the mountain, lie the fabulous Styx, the Elysian Fields, and the place of the dead, as fixed by the Mantuan. More on the height and nearer to the sea, lie buried in the earth the vast vaults of the Piscina Mirabile and the gloomy caverns of the Hundred Chambers—

places that equally denote the luxury and the despotism of Rome. Nearer to the vast pile of castle that is visible so many leagues, is the graceful and winding Baiæan harbour; and against the side of its sheltering hills once lay the city of villas. To that sheltered hill emperors, consuls, poets, warriors crowded from the capital in quest of repose, and to breathe the pure air of a spot in which pestilence has since made its abode. The earth is still covered with the remains of their magnificence, and ruins of temples and baths are scattered freely among the olives and fig-trees of the peasant. A fainter bluff limits the north-eastern boundary of the bay; on it once stood the dwellings of Emperors. There Cæsar sought retirement; and the warm springs on its sides are yet called the baths of the bloody hero. That small conical hill which, as you see, possesses a greener and fresher look than the adjoining land, is a cone ejected by the cauldron beneath but two brief centuries since: it occupies, in part, the site of the ancient Lucrine Lake. All that remains of that famous receptacle of the epicure is the small and shallow sheet at its base, which is separated from the sea by a mere thread of sand. More in the rear, and surrounded by dreary hills, lie the waters of Avernus; on their banks still stand the ruins of a temple, in which rites were celebrated to the infernal deities. The grotto of the Sybil pierces that ridge on the left, and the Cumœan passage is nearly in its rear. The town which is seen a mile to the right is Pozzuoli, a port of the ancients, and a spot now visited for its temples of Jupiter and Neptune, its mouldering amphitheatre, and its half buried tombs. Here Caligula attempted his ambitious bridge, and while crossing thence to Baiæ, the vile Nero had the life of his own mother assailed. It was there, too, that holy Paul came to land when journeying a prisoner to Rome. The small but high island nearly in its front is Nisida, the place to which Marcus Brutus retired after the deed at the foot of Pompey's statue, where he possessed a villa, and whence he and Cassius sailed to meet the shade and vengeance of the murdered Cæsar at Philippi. Then comes a crowd of sites more known in the middle ages; though just below that mountain, in the background, is the famous subterranean road of which Strabo and Seneca are said to speak, and through which the peasant still daily drives his ass to the markets of the modern city. At its entrance is the reputed tomb of Virgil; and then commences an amphitheatre of white terraced dwellings. This is noisy Tripoli itself, crowned with its rocky castle of St. Elmo. The vast plain to the right is that which held the enervating Capua and so many other cities on its bosom. To this succeeds the insulated mountain of the volcano, with its summit torn in triple tops. 'Tis said that villas and villages, towns and cities, lie buried beneath the vineyards and palaces which crowded its base. The ancient and unhappy city of Pompeii stood on that luckless plain, which, following

the shores of the bay, comes next; and then we take up the line of the mountain promontory which forms the Sorrentine side of the water."

As we round in and proceed to our anchorage the great smoking cone of Vesuvius is immediately in front, rising some 4,000 feet above the thickly clustered villages, Portici, Resina, Torre del Greco, and many more which form a continuous line of houses from Naples to Torre Annunziata, beyond which are the ruins of Pompeii. We shall see many other volcanoes on our voyage, active, dormant, or extinct, some, like Vesuvius and Etna, mighty mountains; others, like the Lipari group and Jebel Dokhan, mere islets. It is owing to volcanic action that the harbours of Messina, of Aden and of Albany, take their form, the most interesting being that of Messina, where, apparently, the crater of a volcano has become a land-locked port, with a natural semi-circular quay wall. It may have been active before Etna rose towards heaven. At Albany we anchor close to Breaksea Island, and can see for ourselves the basaltic columns, and watch the great antarctic billows as they dash into the granite caverns, and break out at the summit of the rocks in a steam-like shower of white spray.

Vesuvius varies in height, according to the effects of the last great eruption, and was 3,900 in 1845, while in 1868 it had increased to 4,255, and is now believed to be still rising. The best account of the history of the volcano in a small space will probably be found in Murray's *Handbook for Southern Italy*, and the best maps in Bædeker's. It is evident, even without a map, that at some remote period the whole space between Vesuvius and its companion peak of Monte Somma formed a vast crater, of which a side wall is still visible. Monte Somma is about 3,600 feet in height and receives a trifling increase from the showers of ashes its great neighbour is constantly raining upon it.

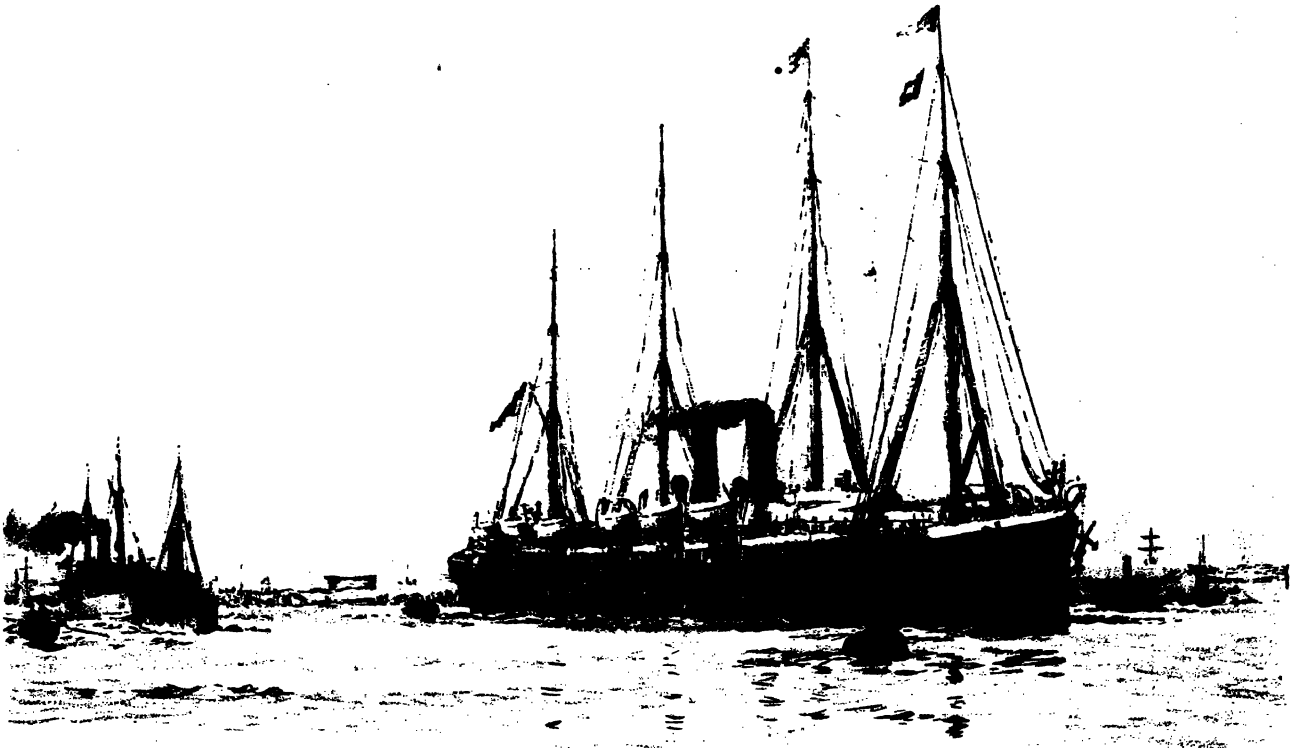
The volcanic character of this part of the Mediterranean is demonstrated clearly by many signs which cannot be overlooked. The first evidences we encounter are in Pantellaria, an extinct volcano, the summit of the island being a mass of sulphur. To the eastward of Southern Italy and Greece there are many extinct volcanoes in the Archipelago, and at least one, Santorin, which is, or was lately, active. Vesuvius is first noticed by ancient Roman geographers, but appears to have been so long quiescent before the time of Titus that a temple was built upon its highest peak. As we see it now the highest building on its sides is the observatory, which has been more or less completely ruined on several occasions. The visitor should enquire in Naples if the "Funicular Railway" is in going order, as it greatly lessens the fatigue of an ascent to be taken up the cone almost to the edge of the crater. The last great eruption took place in 1872, but at night

it is not uncommon to see small streamers of red hot lava slowly descending the slope.

There is much to be seen in Naples, and still more in its neighbourhood. The Observatory, Botanic Gardens, Aquarium and Zoological Station in the public gardens will attract many visitors. The ancient tunnel of Posilippo, and, near it, the traditional tomb of Virgil are very interesting. The summit of the hill with St. Elmo crowning the height, and San Martino, formerly a palace, now a museum, close under it, form the object of a very beautiful drive. But if time is short, the visitor cannot do better than spend it in the Museum. Here all the chief treasures found at Herculaneum and Pompeii are shown, as well as the old royal collections, including books and pictures.

The ancient bronzes in the Museum of Naples are worth any journey one may have made to visit them. Most people will feel that they are a revelation of what bronze statuary can be. There is nothing to be compared with them anywhere else. The exquisitely delicate modelling, the life, the movement illustrate the surpassing excellence of antique sculpture. Here, for the first time perhaps, the visitor understands what art critics mean when they speak of bronze as the best of all the materials of sculpture, because it is nearer than anything else to the first thought, the original conception, of the artist. This dictum is almost unintelligible when one illustrates it by the bronze statues to be seen in the streets of London and other English towns; but in the Naples Museum the meaning is plain enough. The sculptor puts all the beauty and life which his genius can conceive, and his hands create, into the clay model, and all this is transferred by a mechanical process to the bronze; whereas, in marble there are many more intermediate stages, many more touches from the mere mechanic's hand between the clay model of the artist and the finished statue. It may be interesting to note one curious distinction between antique and the best modern bronzes. A bronze statue is never solid; the hollow part inside the statue, which is called *the core*, in modern work is rough and shapeless, leaving the bronze all round an inch or two thick. But in antique bronzes the core is as finished in form as the statue itself: the ancients must have used in casting two perfect models, the one inside the other, the space between the two being surprisingly thin and fine. The bronze of which the statue is made is often so thin as to suggest that the ancients must have had secrets in the art of casting which are lost to the modern world. The best modern bronze casting is now to be seen at Munich.

Another kind of art can scarcely be studied better than at Naples. The discovery of so many intact frescoes on the walls of Pompeii enables us to judge



Oroya

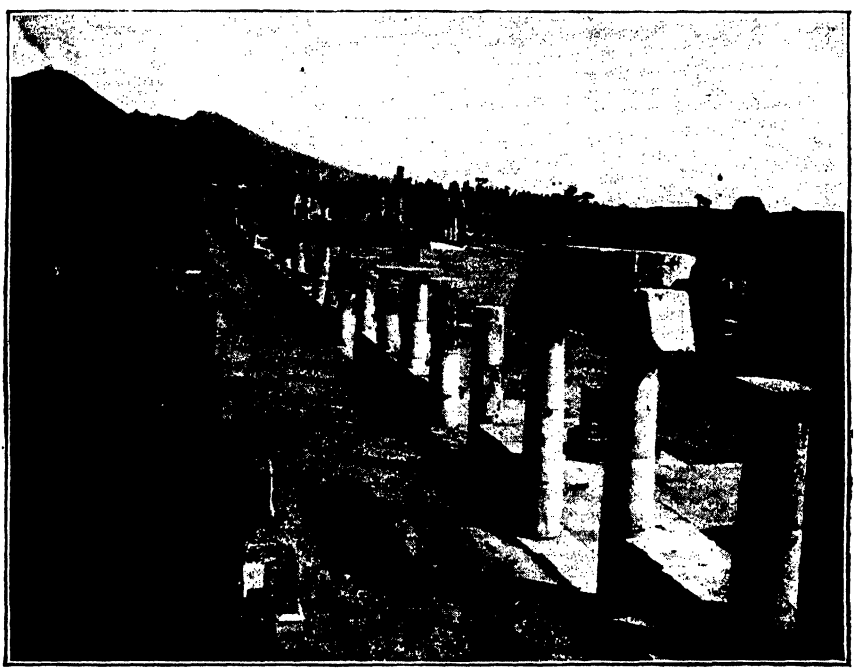
more completely than had before been possible as to how far the ancients had mastered the principles of pictorial art. It must be allowed that, considering their position as sculptors and the immense proficiency they showed in bronze casting, and other arts of the kind, their paintings are strangely deficient. Some of the figure subjects are full of vigour and spirit, and are correct in drawing and colour, but their landscapes, and views of buildings, have for the most part, the grotesque perspective which we associate in our minds with the art of the Chinese, and are as like nature as the view on the willow pattern plate. The chambers of the Museum in which the frescoes—and the mosaics, which partake of the same characteristics—are exhibited, are near the entrance on the ground floor, and should on no account be overlooked. The marbles and the principal bronzes are on the same floor, and a small Egyptian collection which may be neglected by a traveller who has seen the British museum, or who is going on to Cairo.

The marbles are especially fine at Naples. The Farnese Bull was brought from Rhodes to Rome before the time of Pliny. It is, or rather was, for it is now in many pieces, sculptured from a single block of marble, the artists being Apollonius and Tauriscus (third century B.C.). Michael Angelo himself carried out the principal restorations, and so added a new interest to this remarkable group. The subject is Antiope intervening in favour of her rival, Dirce, whom her sons are about to bind to the horns of a wild bull. The Farnese Hercules is another piece of ancient sculpture, the work of Glycon of Athens, and was also repaired by Michael Angelo. The portraits of Roman Emperors are very fine and worthy of careful study. One of these ground floor chambers is well-named the "Hall of the Capolavori," or masterpieces, and contains the well-known bust of Homer, the statue of Antinous, the supposed statue of Aristides, the Venus of Capua, the Gladiator, and above all, the lovely Psyche, found in the amphitheatre at Capua, a mere fragment, but one of the most exquisite and inimitable pieces of sculpture in the world.

In the upper rooms we may indulge in many different kinds of artistic and antiquarian pleasure. The pictures comprise some charming Corregios, including the brilliant "Marriage of St. Catherine"; Titian's portrait of Philip II.; Raphael's "Madonna del Divino Amore"; a doubtful, but beautiful Van Eyck; and many works of the once flourishing Neapolitan School. Passing to the smaller sculptures, we may specially notice one, the relief which represents Orpheus parting for the last time with Eurydice: an affecting group, in the best and simplest style of ancient art.

Finally, neglecting many attractive chambers, we come to those which contain the common objects found at Pompeii; the chairs and tables, the bread and eggs, the combs and toothpicks, the surgical instruments and painted vases, the iron stocks

and loaded dice which have been found from time to time, and have been brought here; nor should we omit to visit the papyrus room, with its skilfully unfolded and often half-charred fragments of the scanty literature of the first century. Nearly all come from a single chamber or library at Herculaneum. Rightly to understand Pompeii when we go there, it will be well to make a careful study of the accurate model of the remains visible of the buried town, which is to be seen in one of



the rooms. Fortunately for English-speaking visitors, an admirable and easily intelligible catalogue can be had at the museum.

Although the best bronzes in the Naples Museum were found at Herculaneum, not Pompeii, the latter place is by far the most interesting. Herculaneum was buried in lava, Pompeii in ashes. Thus the ruins at Herculaneum have had to be hewn out of a substance as hard and solid as rock; whereas the ashes which covered Pompeii have become converted into soft and easily worked earth, which can readily

be removed by spade, pickaxe and hand. Moreover, the site of Herculaneum has been repeatedly covered by successive eruptions of lava and ashes; consequently the ruins which have been excavated, lie at a great depth (forty to one hundred feet) below the present surface. This makes a visit to Herculaneum resemble in some respects a descent into a mine; the dim torch of the guide is a poor substitute for the glowing Italian sunshine that will light the visitor to Pompeii.

The interest in Pompeii is like nothing else in Italy or perhaps in the world; repeated visits only add to the wonder and awe of the first impression. Here we see a city of the dead, dead these eighteen hundred years, and yet the Pompeiians seem strangely real and alive as we tread the silent streets. The marks of the chariot wheels are there; the oil jars are in the shops; the drinking fountain is there with the soft stone worn by the pressure of hands that were living when Jesus dwelt on earth; the baker's loaves are in the oven; the splendid bath is there with the vases for ointments and perfumes; in the museum attached to the ruins may be seen the casts taken of human figures crouching together or clasped in one another's arms as they were when the last awful moment came. One of the casts here is that of a dog which has fallen on its back with its feet in the air; the attitude of the poor beast expresses pathetically the horror of the fate that overwhelmed it, together with its human fellow creatures. One feature of Pompeii, which is not often dwelt on by guide books and travellers, is the exquisite beauty of its surroundings. Vesuvius sends its pillar of smoke into the blue sky on one side, on the other is the Bay of Naples, with Castellamare and Sorrento sparkling like jewels on its shore. It is remarkable how little has been discovered at Pompeii since the publication of Sir William Gell's book. Still, the number of small, but by no means unimportant objects has been considerable, and adds greatly to our knowledge of the domestic life of the ancient Romans. The great public statues, fountains, columns and altars were among the first things dug out, for no difficulty impeded the discovery of the chief buildings, for the upper wall of the great theatre was always visible above ground. In 1748 a peasant sinking a well found a painted chamber, and the King of Naples, Charles III., who had been much interested by the discoveries at Herculaneum a few years before, carried on the excavations. They have never ceased for any long period since, yet only about three-fifths of the whole area has been cleared.

A surprise is in store for the traveller who drives from Naples to Pompeii. The distance is about fourteen miles, and if determining to forsake the railway, he propose to himself the pleasures of a country drive, he will be disappointed, for every yard of the fourteen miles is through a swarming mass of human beings;

Palinuro, named after Palinurus, the pilot of Æneas, whose tomb is marked by a tower on a cliff some eight miles northward of the cape ; thus is said to be fulfilled the Sybil's promise in the *Æneid*—

"And Palinurus' name the place shall bear."

The ever active Stromboli is next sighted, and the Lipari islands passed to the westward. On these islands, the *Insulæ Æoliæ* also the *Vulcaniæ* of the ancients, Æolus held the winds imprisoned in caverns, loosing them at his pleasure. Here too Vulcan forged the bolts of Jove. One small islet, Volcano, has of late years been very active.

Two hundred miles from Naples the Strait of Messina is entered, the steamer passing between the legend honoured rock of Scylla and the whirlpool Charybdis, and close to Capo di Faro, the Pelorum of the ancients, said by some to be so named after another famous sailor, Pelorus, the pilot of the ship that carried Hannibal from Italy, who was killed by Hannibal in a fit of anger. The Carthagenian afterwards, assured of the fidelity of the pilot, and lamenting his own cruelty, buried him in pomp on the point, and ordered it to bear the name Pelorum. Be this as it may, the lighthouse was built by the English during their occupation of Sicily, at the beginning of the present century.

The currents in the Strait of Messina are variable, and at times attain a velocity of three knots ; near the coast counter currents are experienced. The meeting of the opposing currents produces in several parts of the strait the whirl and rippling, locally known as "Garofalo." The principal whirls occur on the coast of Sicily, between Faro Point and Sottile Point with the ebb, and off Palazzo Tower with the flood. At Pezzo Point, on the Italian coast, there is a very strong "Garofalo," which is dangerous to small boats with a south-east wind. The eddies on the Sicilian coast appear to represent Charybdis. The strait at the northern entrance is but two-and-a-half miles in width. On the Italian side, just north of the narrowest part, is the village of Scylla, standing 200 feet above the tidal eddy. Under the village the rocks are hollowed away, and the agitated waters make the strange sound that legend attributed to the dogs of Scylla. The depth of water is no less than seventy fathoms.

Messina itself, founded by the Greeks as a colony nearly 3,000 years ago, is still a flourishing port. The long line of its Marina, with handsome buildings rising one above another, the whole being backed by a dark forest, gives the town a fine appearance from the sea. The semi-circular harbour is natural, and would seem to have been at some remote period the crater of a volcano. Its sickle shape is supposed


SWITZERLAND
AUSTRIA
ITALY
CORSICA
SARDINIA
TYRRHENIAN SEA
ADRIATIC SEA
IONIAN SEA
MEDITERRANEAN SEA
SICILY
AFRICA
Malta Channel
Gulf of Genoa
Gulf of Taranto
VENICE
ROME
FLORENCE
NAPLES
BAY of NAPLES
Longitude East of Greenwich
8
10
12
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18
36
38
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42
44
46

by some scholars to have given a name to the whole island. Messina seems to spread itself for miles along the shore on the right as we enter the strait. Old castles and towers top every eminence, flanked by strong modern forts, of which one, just within the harbour, is the Citadel, and was the last place to hold out for Francis II. British forces have on several occasions occupied Messina, and it was from this place that brave Admiral Walton sent his laconic depatch to Byng, "Sir, We have taken and destroyed all the Spanish ships and vessels which were upon the coast—number as per margin." The cathedral is in part very ancient, having been built by Count Roger and his son, the Norman conquerors of Sicily, and has some fine Syenite columns. There is a small picture gallery which contains the faded—or still worse, restored—remains of five pictures by Antonello da Messina. A railway runs from Messina to Catania, and the towns on the slope of Etna are very numerous and chiefly well worth a visit. The most remarkable is Taormina. No description can do justice to the view from the ruined theatre. The old columns frame a picture of the white summit of the volcano, with its tiny puff of smoke; and 420 feet below is the deep blue water of the strait.

The view of Etna from the sea is also very grand. There is no other mountain in Europe which gives the same impression of height, for we see all its 10,880 feet close at hand. The Sierra Nevada, in Spain, as seen from near Capo di Gata is slightly higher, but is so far inland that it does not appear to over-top the low mountains in the foreground. The chief villages worth mentioning along the strait, besides Reggio on the opposite coast, the capital of Calabria, are Aci Reale and Aci Castello, both named from the torrent Acis, so well-known in legendary history, and immortalised by Handel in his opera of "Acis and Galatea." The stream may be made out from the deck as we pass. Before we are abreast of Catania we are through the strait, and turn sharply eastward, so that Syracuse seldom comes in sight.

Syracuse—once "the largest of Greek cities," fourteen miles in circumference, of wider dominion than Athens or Sparta, the mistress of Sicily, whose citizens were reckoned by hundreds of thousands, whose wealth and luxury were unbounded; a city adorned with the utmost magnificence, and the choicest treasures of architecture, sculpture, and painting, the rival of Athens, the antagonist of Carthage and of Rome —is now a provincial town of some 19,300 inhabitants, and has shrunk to a mere fraction of its ancient dimensions, the island, or rather the peninsula, of Ortygia being the only one of its five once populous districts that is now inhabited. It is "just as if London were reduced to the Tower and Tower Hill, or Paris to the island in the middle of the Seine." The appearance of modern Syracuse is in

accordance with her fallen fortunes. The streets are narrow and confined, and with few exceptions, are dirty. But there are a few interesting palaces of the middle ages, also numerous churches and convents, but save one or two of the churches, none of the modern buildings possess attractions for the traveller. The women of Syracuse have more beauty than is usually seen in Sicilian towns, and not seldom show their origin in the true Grecian profile. It would take at least three days to make the entire tour of Syracuse, and to visit all its objects of interest, which are far too many to be enumerated here. In the city itself are the cathedral, once the temple of Minerva, and the celebrated Fountain of Arethusa on the north side of the town. Here Lord Nelson watered the British fleet on his way to the Nile, "and surely," he wrote, "watering at the Fountain of Arethusa, we must have victory." The Museum is well worthy of a prolonged visit, its chief ornament being a marble statue, unfortunately headless, of a goddess. The amphitheatre, altar, and other monuments of Neapolis, with the Ear of Dionysius, are within easy reach, as are also the catacombs and the ancient Latomiæ, or quarries, of Acradina; but a visit to the Fortress of Euryalus, on the crest of Epipolæ, and the walls and defences constructed by Dionysius the Elder in twenty days, with 60,000 men and 6,000 oxen, would occupy nearly the whole day. The story goes that the cavern which is called the Ear of Dionysius (*Orecchio di Dionisio*), was excavated by the tyrant for a prison, and was so planned that the smallest whisper uttered at its remotest extremity could be heard in a chamber high in the innermost wall, where he is supposed to have sat listening to the conversation of his victims. It is a pleasant boating excursion from Syracuse to the river Anapus, which rises in the Fountain of Cyane, and is the only stream in Europe where the papyrus may be seen growing wild. Without entering into the history of Syracuse, the following dates may, perhaps, be of interest:—Founded 734 B.C.; unsuccessfully besieged by the Athenians, under Demosthenes and Nicias, 413; conquered by Dionysius the Elder, 406; and taken by the Romans, under Marcellus, 212, when Archimedes was killed; taken by Belisarius from the Goths, 535 A.D.; by the Saracens, 878; by the Greeks, assisted by the Normans, 1038; again by the Saracens, 1040; and by Roger the Norman, 1085.

On the Italian coast some of the rocks are well worth looking at, as they are rough, steep and precipitous to a degree seldom or never seen in our country. Behind Reggio are the fine wooded heights of Aspromonte, below which, on the plain, Garibaldi was defeated and taken prisoner by the Italian troops, 29th of August, 1862.

The best season for an ascent of Etna is the summer, and as a night must be

spent on the mountain, moonlight is indispensable. The "Three Zones" of Etna are very well marked. First there is the cultivable zone, full of oranges, lemons, olives, and vines. Then we reach, at about 3,700 feet, the forest tract, with fine shady trees, oaks, chestnuts, and beeches, above which is a region of pine-wood, extending to nearly 7,000 feet. Thence to the summit is almost barren, though some small plants, peculiar to Etna, have been identified by botanists. The black lava is over every thing, and in some parts of the slope the scene of desolation is appalling. The great cone, dazzlingly white, except at midsummer, rises from this lifeless region. The whole distance to be traversed from Catania to the cone is about twenty-nine miles. The cold is intense, and even in the height of summer the thermometer falls below freezing point.

The view from the summit on a clear day is superb beyond description. Sicily, spread out like a map; the Faro of Messina, the Lipari Isles, and, at times, Malta, on the south, and Vesuvius, on the north, complete the magnificent panorama. Not the least interesting part of this splendid prospect is the distinct image of the mountain itself, seen by means of its shadow projected upon Sicily.

The British dependency of Malta lies nearly due south of Sicily, and consists of three inhabited islands and some rocky islets, about fifty-seven miles from Cape Passaro. Gozo is the most westerly of the group, and is sighted first from an outward bound steamer. It is singularly wanting in feature, being apparently flat, barren, and brown; but outward appearances belie it; and Gozo, though only ten miles long and half as many wide, is very fertile and very thickly inhabited. It contains some curious ancient remains, possibly Phœnician. Then, as Comino and Cominotto are passed, we have a view up the narrow inlet traditionally held to be the scene of St. Paul's shipwreck, and in a few minutes more come in sight of Valetta. On the high ground behind we may descry Citta Vecchia, or La Notabile, the cathedral of which is supposed to occupy the site of the house of Publius, the Roman governor. In the valley below stands the Church of Mosta, one of the largest domes in the world, but, on account of its poverty of design and want of architectural proportion, it looks from the sea more like a magnified corn stack than a building. The dome, which within is quite plain, spans 118 feet, being ten feet more than the dome of St. Paul's, in London. As Valetta comes in sight, the beauty of its situation will charm the visitor. There are, in fact, few cities so well planned, and so highly favoured also by nature. On a lofty tongue of limestone rock, bordered on each side by magnificent harbours, in which a whole fleet can anchor, Valetta is surrounded by suburbs as great as herself. I have counted thirteen domes in one view from the hill of Sliema. The architecture

disappoints the critic, and St. John's, in Valetta, is one of the ugliest churches in the world: but no one can deny that the general effect of the streets is picturesque in the extreme.

Malta was long under the domination of the Knights of St. John. In 1798 it was seized by the French without resistance, but they made themselves so odious to the people that a rebellion broke out, and some English ships coming to the assistance of the Maltese, the French were cooped up within their fortifications and starved into surrender, 5th September, 1800. In 1814 Malta was formally ceded to England, and ever since the people have enjoyed all the rights and privileges of British subjects. The Maltese language is a dialect of Arabic, corrupted by a mixture of Italian. A little of the colloquial Arabic which a traveller picks up in the Cairene bazaars may be found very useful in Valetta.

With Etna in sight astern of her, the steamer leaves the Strait of Messina for the land of Egypt, which will be sighted in something less than three days. During this time the peaks of Candia or Crete form a splendid view for many hours. In front is an island called in Turkish Gavdo, in Arabic Gozo, supposed to be the Cauda of Acts xxvii., 16, and sometimes mistakenly printed "Clauda." In all the lives of St. Paul that I have seen, there is an evident error about this island. As the ship in certain winds and currents sails between it and the coast of Crete, the minute accuracy of the description in the Acts becomes apparent: "a haven of Crete looking down the south-west wind and down the north-west wind." The view of Mount Ida, the birthplace of Jupiter, with its snowy peaks, 8,000 feet high, is remarkably fine.

The low sandy coast of the Delta may sometimes be sighted when we are abreast of Damietta, two high towers of which town may be seen over the flats. The whole coast is most flat and uninteresting. Between June and October the discoloured water met with far out of sight of land, tells us that the Nile is pouring its vast contributions of sand and mud into the Mediterranean. Were we near enough to see them, Alexandria and its buildings would remind us of the bombardment and destruction of the formidable forts by the British fleet, under Admiral Sir Beauchamp Seymour, and of the subsequent sacking and burning of the city by the Egyptian rebels. Of the great victory known as the battle of the Nile, Mr. Hannay gives us the following account:—

"The battle of the Nile, 'the glorious first of August,' though perhaps the most complete and astounding naval victory ever won, is comparatively easy to understand. Our enemy was at anchor throughout, and there were none of those manœuvres, those tackings from port to starboard, and sudden turnings of van into rear, which so puzzle the landsman in accounts of fights under sail, and in the open sea. When

Nelson's fleet hove in sight in the afternoon of the 1st August, 1798, the French fleet was at anchor in Aboukir Bay. There were thirteen of them in all—one three, and twelve two deckers. The French line formed a very obtuse angle with its point to the sea. The head and rear vessels bore west-north-west and east-south-east of one another. All were heading to the west swinging by an anchor, and each was to port of the vessel ahead. Inside the line, between the great ships and the shoal water of Aboukir Bay, were anchored the frigates and the small vessels. The two flanks were covered by batteries on shore.

"The English fleet consisted of thirteen 74-gun ships and one 50-gun.

"The *Culloden* 74, Captain Thomas Troubridge, was at some distance to the north when the signal to form a line of battle and attack was hoisted on the *Vanguard*. The *Alexander* 74, Captain A. J. Ball, and the *Swiftsure* 74, Captain Benjamin Hallowell, were far to the west. All three were crowding on sail to come up, and the names of their captains are proof enough that it was no fault of theirs if they were not first in action. Nelson had followed the French in hot haste, and when he sighted them in Aboukir Bay his ships were scattered. The rapidity with which the line of battle was formed, and the beautiful order in which the English ships came flying into the bay before the lively topgallant breeze from the north-west, extorted the admiration of the French. Nelson's plan of battle was founded on one drawn up by Lord Hood, a skilful strategist of Lord Rodney's school, for the attack of a French fleet at anchor. His first intention seems to have been to place his vessels outside of the French, on their bow and quarter, but immediately before the action this first design was modified either by Nelson himself, or on the suggestion of somebody else. The essential thing is that the Admiral saw that where a French ship could swing an English ship could anchor. In other words that there must be room to pass inside the French, and so by placing part of the English fleet between the enemy and the land, and part to seaward of him, it would not be impossible to bring an overwhelming force to bear on a portion of his line. As the attack was to be made on the van and centre, that is on the windward or Aboukir Island end of the French line, the leeward ships of the enemy would be unable to come to the help of their comrades. The English plan of battle provided for doing what is by general consent the greatest of tactical feats, for so placing a smaller force that it should be in overwhelming superiority at the point of attack. Everything was in splendid order on the English ships, officers and men alike animated by a noble spirit of confidence.

"It was late in the evening—not, in fact, till 5.40—that the signal to form in line ahead and astern of the Admiral was hoisted on the *Vanguard*. But the English

seamen of that period believed that night was in their favour—such was their reliance on their own discipline, and orders had been given to hoist four horizontal lights at the mizen peak as a signal. The sun was very low when the *Goliath* and the *Zealous*, the two first of our line, came down along the east fringe of the shoals round Aboukir Island with the wind on the starboard side, and steered to cross the head of the French line. The enemy waited till we were at half gunshot from him and then opened fire, at 6.20, aiming too high as his wont was. Although the English ships as they came in were exposed to a raking fire from the French van, they suffered very little, as most of the shot went over them. Just before the sun went under the horizon the *Goliath* passed close ahead of the *Guerrier* and raked her with deadly effect. Then she turned to port and coming up on the inside of the French line anchored on the port quarter of the *Conquerant*, the second Frenchman. Captain Foley had run beyond his proper place, which should have been alongside the *Guerrier*. Captain Hood took up the anchorage he had missed and began pouring in broadsides. In a few minutes down came the *Guerrier's* foremast. This was the last of the battle the sun shone on, and it was greeted with a loud cheer along the English line. We had drawn the first blood. In the rapidly growing darkness of the south, and guided by the flashes of the broadsides, the *Orion*, *Audacious*, and *Theseus* successively came into place on the inside of the French line as far down as the *Peuple-Souverain*, the fifth ship. As the *Orion* came in she passed so close to the *Guerrier* that the Frenchman's jib-boom was barely six feet from her rigging, and then poured in a double-shotted broadside which brought down the enemy's two remaining masts, and left her a helpless hulk. The sixth ship of our line, Nelson's *Vanguard*, now came into action, anchoring on the outside of the French, alongside the *Spartiate*, their third vessel, which was already engaged with the *Orion* on the inside. Then the *Minotaur*, the *Defence*, the *Bellerophon*, the *Majestic*, and even the little *Leander* of 50 guns, followed in her wake, and placed themselves on the outside of the French line as far down as the *Tonnant*, the vessel astern of *L'Orient*. Thus ten English ships were engaged in positions of commanding advantage with eight Frenchmen. All our vessels were not equally fortunate. The *Bellerophon* was dismasted by the fire of *L'Orient* and had to drift to leeward out of action. The *Majestic* fell aboard of the *Tonnant* and was badly raked for a time. Her captain, Westcott, fell shot through the throat by a musket ball, but Lieutenant Cuthbert took his place, got clear of the Frenchman and revenged his captain by cutting open the bows of *L'Heureux* with furious broadsides. In the meantime the three vessels left behind had come hurrying on. The *Culloden*, indeed, went ashore on Aboukir Island to the despair of Troubridge, but her lights served to warn the *Alexander* and

the *Swiftsure* which came into battle in time to replace the crippled *Bellerophon*. Before this the French van was utterly crushed, and the English vessels were able to drop down towards the centre and rear. It was now between eight and nine o'clock. At about the latter hour the *Swiftsure's* people saw the first signs of the awful disaster which had overtaken the French centre. *L'Orient* was on fire. She had suffered much from the English cannonade which she returned most gallantly, and now some misfortune on board had set her in flames. Until ten o'clock the great three-decker blazed with fury, while the English ships cleared as far away from her as they could. Captain Miller, of the *Theseus*, whose noble letter to his wife gives the best account of the battle, had his vessel sluiced with water as a precaution against burning fragments when the inevitable explosion should come. At ten o'clock *L'Orient* blew up with a mighty roar, and a concussion which shook every ship in both fleets. Nelson, who was lying blinded by a wound on the forehead in the cabin of the *Vanguard*, rushed on deck at the crash, and began to give orders for the sending help to the Frenchmen. By this time the battle was won. When day broke Aboukir bay was full of crippled and dismasted ships. The victors had suffered heavily, but the vanquished were destroyed. Only three of the French liners escaped destruction in the night. Of these the *Timoléon* was driven on shore and burnt next day, but the other two escaped for a time, as the English ships were too severely damaged to pursue them. Neither of them ever saw France again. The *Guillaume Tell* was captured off Malta by the blockading squadron, and the *Généreux* was in Valetta harbour when the island was surrendered. It was the most complete destruction of an enemy ever seen—even Trafalgar was not greater."

We shall visit Cairo from a landing place on the Suez Canal, and need only to glance at Alexandria in this place. It is hardly seen until a ship is well into the harbour. A long low line of white houses, another line of higher ground behind; numerous chimneys, among which some keen-sighted voyagers may perhaps discover Pompey's Pillar; a not very lofty lighthouse to the eastward; a whitewashed, shabby-looking house with a balcony, the Khedive's palace, on Ras al Teen, the extremity of the harbour; and a goodly number of ships, some of them magnificent yachts of a former Khedive, now laid up and useless, form the view. An English man-of-war is generally at anchor, and her boats may be seen going out to help in the destruction of the rocks which bar the passage in. A big English mail steamer leaving for Italy, an occasional warship of France, or Russia, or America, and the scenery of the harbour is exhausted.

The road from the landing place conducts us through the wretched buildings of

the Custom House, which, since it has been under English management, is a source of revenue to justify a little expenditure in improving the first place of importance which meets the eye of the stranger in Egypt. The lowest and most squalid part of the town is on the quays. There is no handsome "Marina" as at Nice or Messina, and it is not until we have borne a rapid drive over the worst pavement we shall encounter in our voyage that we reach the Grand Square, by the French called the "Place Mehemet Ali," which has been wholly rebuilt, with handsome shops and offices, since it was destroyed by Araby and his mutinous soldiers. With the exception, to the antiquary, of an attempt made on the spot to reconstruct the Heptostadium, an artificial dyke which connected the island of Pharos with the mainland, and a visit to Pompey's Pillar, erected in honour of the Emperor Diocletian by Pompeius, a governor of the city in his reign, now chiefly remarkable for its shaft of granite from Upper Egypt, consisting of a single stone seventy-three feet in height, there is nothing to delay the traveller in Alexandria.

We now approach Port Said, a place from which the easiest access can be obtained to the Holy Land, as frequent steamers run to Jaffa and Beyrout. Those who have leisure on the voyage between England and Australia may, by leaving the steamer at Port Said, visit the Holy Land with ease and in comfort. A short sea passage takes one to Jaffa, the ancient Joppa. The landing here is not always easy, but when once we stand on the little quay we are repaid for our trouble. Jaffa is full of mythical and historical associations. Here Perseus encountered the monster and rescued Andromeda—here the prophet Jonah took ship—here Peter, going up to the housetop, had his vision, and hither came the messengers of the Roman centurion, Cornelius, to teach the apostle the comprehensive significance of his dream. In the times of the crusades Jaffa was often taken and retaken, and in later times it resisted for a few days an attack of the French General, Kleber, but was finally captured. Napoleon ordered the plague patients to be poisoned here in 1799, and a doubtful tradition shows the room in which he gave the order. A railway has lately been opened, and makes the journey to Jerusalem in about three hours. But, in fine weather, by far the most pleasant way is to ride. Leaving Jaffa in the afternoon, and resting for a few hours at Ramleh or Latron, we reach Jerusalem pleasantly in the morning of the next day. The journey first lies through the plain of Sharon, but soon after leaving Jaffa the road is rough and hilly, and as we proceed, after quitting Ramleh, the ascents are precipitous and difficult. The approach to the Holy City from Jaffa is disappointing. The commonplace residences forming the suburb known as "New Jerusalem" resemble the houses on the outskirts of any modern European town, and dash the

high-wrought expectations of the pilgrim. He is thinking of the Mosque of Omar and the Church of the Sepulchre, and he sees only the huge mass of buildings known as the "Russian Mission." His anticipations, however, are more than satisfied when later in his stay he comes upon the view of Jerusalem from the Bethany road, and pauses on the rocky ledge whence Christ 'beheld the city and wept over it.' The railway from Jaffa to Jerusalem was completed and opened for traffic in September, 1892. The line is fifty-four miles in length, and rises 2,500 feet above the sea level at Jaffa, zig-zagging through many steep defiles and river valleys. The stations are Lydda (where St. Peter cured Æneas, and raised Tabitha); Ramleh, "the Sands" (where is a mosque dedicated to one of the *Erbaeen*, or forty original companions of the Prophet, with a very English looking tower); Sejed (near a farm belonging to the Sultan); Deir Aban (where to the southward is a Latin convent); Bettir (a mountain village); and the latter part of the journey is through the plain of Rephaim, where on so many occasions David encountered the Philistines. It is impossible to give even a list of the objects of sacred and historic interest within the circle of the walls, but the two buildings around which associations most thickly cluster are the Dome of the Rock and the Holy Sepulchre. The Dome is the superb porcelain-tiled cupola of the Mosque of Omar. The rock which it covers is the traditional summit of Mount Moriah, the scene of Abraham's arrested sacrifice of Isaac, and possibly the threshing-floor of Araunah or Ornan the Jebusite. Though opinions differ as to the precise spot which Solomon's Temple occupied, the traveller may perhaps safely conclude that the sacred edifice must have stood in the centre of the area on a second terrace probably corresponding with the upper platform of the present day.

The Rotunda of the Holy Sepulchre is a modern structure rebuilt in 1810. It is crowded with shrines and chapels, altars and oratories, lamps and pictures, images and icons. Whether the building, popularly called the Holy Sepulchre, does or does not cover the sites of the Crucifixion and Interment, is debated by those best acquainted with the site. Herr Schick, a learned German, who has resided many years in Jerusalem, pronounces strongly for the Church of the Holy Sepulchre. It is startling at first to go up a flight of steps from the Holy Sepulchre, and to find on an upper storey of the same building the Hill of Calvary; but we must recollect that the garden containing the new tomb of Joseph was "in the place where he was crucified." At all events, they concentrate and bring to one focus the devotion of many nations. A hill to the north westward of the City walls, beyond the Damascus Gate, has, for fifteen years past, been pointed out as resembling Golgotha. In the side of the hill is a tomb, which is certainly of about the first

century. Here General Gordon, before he went to his death at Kartoum, used to spend much time, and the site has been accepted by a large number of our countrymen. It is, however, very doubtful.

From Port Said also it is easy to visit Greece. Mr. Richmond, A.R.A., contributed an account of a journey in that classic region to former editions of this book, and we extract his notes on Athens :—

"On first sight all looks so dusty, so unlike the memories of the extending branches of a great city; but as we proceed fragments of the Keramicus appear, after we have passed the Temple of Theseus, beautiful and golden in its armour of age, earlier a little than the present remains of the Acropolis buildings; that is, earlier than those commonly seen and known. Recently so many remains of pre-Persian invasion are unearthed, that the student of art and archæology has but to search and he will find.

"He will see the foundations of the Temples of Athens, and tinted statues throwing such clear light upon a much disputed point, decided now for ever, let us hope. And fragment on fragment of precious relics of the Attic past are let into the walls of the Propylæa, passed over too hastily by the ordinary traveller. We stand between that ancient row of eight columns, including the two belonging to the portico, and between the six Ionic columns supporting the vestibule of the Propylæa or gate of the Acropolis—here a moment we pause, and stand back between the shafts of the mighty building to watch procession after procession of ancient history pass before us. Pericles and Aspasia, Phidias and his companions, Socrates, Plato, probably, too, Saint Paul, pass as phantoms over our minds. Saint Paul who spoke from the Mars Hill condemning the gods made with hands; there we can imagine him standing pointing to the figure of Pallas Athene, just visible above the walls, and through her image denouncing the ancient myths and idolatry in his passion to promote the interests of a new order. But as interesting, or more, to some of us, as we think of the past, is the procession which passes of men, women, soldiers, and heralds, commendating Pallas Athene. Crowds fill the whole top of the hills; a bright spring day dazzles; colour and light make up a panoply of glory; the bright and trained youth of Athens, fresh from training, full of life, pass; women in the bloom of youth chant the hymn of praise to the virgin goddess, while they bear their sacred burden of a newly-embroidered peplos to the shrine of Pallas Athene. The heralds marshal the whole procession. Warriors mounted seven abreast canter by, restraining their too eager steeds. Sacred unctions for sacrifice are carried in vases by stately maidens. The marble rings with the echo of the passing pageant. The Acropolis is alive again once more. Yet for us it is a dream; all this of that glorious time when art went with the people—was a part of her culture and religion

—is dead. And wakened, we are again in the nineteenth century, lost to all beauty, needing none. Welcome, indeed, the dream of a past, quite lovely, but so apart from us, so cut off from the current sympathies of our majority, that who can enter into it but those who love it and would that something akin to it might bloom again?

"This cannot be, and we let ourselves wander over the sacred hill and see the Porch of the Erechtheum, sacred to the olive tree brought to Greece by Athene. For this sacred emblem and for the preservation of it the Porch was built. Far more intricate is the history of this temple than of that vast pile of marble gathered from Pentelicus and moulded into the most refined shapes by the genius of Ictinus, and the imagination of Phideas, the Parthenon.

"We wander to the Museum of the Acropolis and see the coloured remnants of marble—earlier these than Phidian time—daintily coloured eyes, eyebrows, hair, and garments. The Greeks knew well that to place against the highly wrought interiors of their temples bald white marble statues to gods, goddesses, or heroes, they would do a religious, as an artistic, indignity to their deities, so they coloured their statues with as near a similitude to life as they knew. Gold, silver, even precious stones, together with strong red, blue, and yellow, were used as adornments of the temples. So raw marble would indeed have appeared poor and ghostly under such magnificent settings. So the tinting even the colouring of statues became a necessity to avoid poverty of contrast. Examples enough of this treatment have recently come to light. We gather from such clear sources of information, to be gathered in Athens, together with the rich descriptions of Pausanias and of the ancient Homer, that the Greek knew how to pile luxury on luxury where his superstition or religion was concerned, however humbly in the earlier time the majority or the well-to-do lived. The influence of the Greek drama over the politics and religion of the people is seen on all sides. Every state had its theatre—not a theatre according to modern ideas, but set apart in solemn worship. The theatre called after the name Dionysos, around whom hang the mists of dramatic creation, as we now see it is a restoration of the Roman Hadrian, but the site is that of the representation of the Sophoclean and Æschylean dramas. The ancient theatre was of wood, save the tiers of seats. We sit in the chair of the Archon—a jumble of ancient and Roman design—and look towards the stage, figure the masked actors, who declaim before such a scenic background as no other theatre can possess. That level line of sea, with silver islands rising into the summer light, is indeed a fit background."

CHAPTER VI.

THE SUEZ CANAL.

LAKE MENZALEH.—PORT SAID.—IN THE WAR OF 1882.—THE CANAL OFFICE.—THE DESERT.—THE MIRAGE.—THE CHANNEL.—PILOTING.—KANTARAH.—AL GUISR.—LAKE TIMSAH.—ISMAILIA.—THE SERAPEUM.—THE BITTER LAKES.—CHALOUF.—PORT TEWFIK.—TERREPLEIN.—HOW THE CANAL IS WORKED.—SUEZ.—SINAI.—STATIONS IN THE CANAL.

ALL along the northern coast of Egypt, from what used to be called the Phatnitic Mouth of the Nile, near Damietta, to Port Said, a distance of some thirty miles, there is a narrow, sandy shore, supposed, though on the Mediterranean, by some writers to be the site of the Crossing of the Israelites, and very dangerous for passengers in a changing wind. This narrow beach divides the Mediterranean from Lake Menzaleh, a vast, half marshy lagoon of brackish, shallow water, dotted with islets, and possibly destined in the near future to contain some of the most valuable and fertile land in the world. At present it is the common fishing ground of hordes of very wild Arabs, and of flocks of pelicans, flamingoes, and ducks. The embankments of the Suez Canal cross the lake, and that portion which lies eastward towards the ancient Pelusium and the road into Palestine, the fighting ground of Egypt and Assyria, is now dry.

Port Said is not seen till we are just upon it. The reclaimed sands on which it stands are not more than a few feet above the level of the Mediterranean. In rough weather the great waves seem as if they must flood the town, but the beach is wide and the sea very shallow for a long way out. The first object sighted is the lighthouse, 175 feet high. The ship lies close to the front row of houses, probably looking right up the principal street. Unless the delay is likely to be long, there is no occasion to land, as there is very little of the picturesqueness of the East in Port Said. The traveller is beset by a horde of beggars of all nations, and can examine nearly everything of special interest in from five to ten minutes. Probably, a few Arabs in their native dress, a woman or two in her dark blue gown and veil, and

perhaps a camel, will be among the most memorable rarities to be seen here. There is an English hospital, founded by the late Viscountess Strangford, and called after her, which those who are interested in such institutions should not fail to visit. Lady Strangford, who had long been in bad health, died on board the *Lusitania*, one of the ships of this line, in 1883, when on her way to open the hospital. It is intended primarily for the use of British seamen, of whom fully 200,000 pass through Port Said in the course of a single year. It is supported entirely by voluntary contributions, and the passengers of the Orient Line, so far, enjoy a pre-eminence in the amount of a single collection made when passing Port Said. There is also an Anglican church, of curious rather than beautiful design, but calculated for the reception of a large congregation.

Memories of the war of 1882, which led to the occupation of Egypt by English troops, are cherished at Port Said. At the time of the seizure of the Canal, before the battle of Tel el Kebeer, as Mr. Charles Royle tells us in his *Egyptian Campaigns* (i. 262), H.M.S. *Monarch* was so moored off the town that her forward turret guns commanded the main street leading to the quay, while the *Iris* was to seaward, where she could shell the beach and the Arab quarter. "At eleven, on the night of the 19th August, 1882, the ships' companies were called on deck and warned that they would be landed at three a.m. The strictest silence was enjoined. So well was this order carried out, that those on board the French ironclad, *La Gallissonière*, moored close astern of the *Monarch* and to the same buoy, knew nothing of what was going on." The men were landed from a lighter, which formed a floating bridge, and quietly surrounded the barrack. The sentries on the quay were secured by six marines, and two companies of the same force were posted in such a way that escape from the barracks was impossible. The Arab soldiers appeared to be asleep. There were 160 of them. They immediately piled their arms and surrendered without a blow. "Of the arms surrendered by the Port Said garrison, but one piece was loaded. The military commandant was absent, and the Egyptian sentries were asleep at their posts."

As soon as the ship begins to move past the town she is virtually in the Canal. The offices of the Canal Company are among the last of the buildings. Here an amusing scene took place in the 1882 campaign. "Captain Seymour occupied the office of the principal transit agent of the Canal Company, and a midshipman not more than fifteen years of age was told off with a party of blue jackets to take possession of the company's telegraph apparatus. When the telegraph agent arrived, he was forbidden to enter his own office by the small midshipman, who said, with a very good French accent, 'On ne passe pas.' The Frenchman (all the

important posts in the Company are filled by Frenchmen) looked at the diminutive object in front of him with dignified astonishment, and demanded 'Qui êtes vous? Que voulez vous ici?' 'Je suis ici pour empêcher le monde d'entrer,' answered the midshipman." The fact that the lad spoke good French was probably the reason of his selection, but it will be remembered that the officials of the Company made themselves very obnoxious to the British forces, and were known to be supplying information to the rebels. The fleet and transports—among which was the *Orient*, with the Duke of Connaught and staff on board—entered the Canal on the 20th August, and it was remarked that among the few that had pilots, one, the *Catalonia*, was run aground a little further on.

Port Said contains a population of about 14,000, the greater part native coaling porters. The place is called after Said Pasha who was Viceroy of Egypt when it was first founded. The breakwaters east and west are, the western, about two miles long, and the other, rather more than a mile. Although there is no perceptible tide, a current from the westward would soon silt up the mouth of the harbour with Nile mud, but for constant dredging and for these long walls. Water was supplied to the town only by an iron pipe from Ismailia, but many improvements are now in progress. A canal for fresh water, and a light railway for passengers and mails are recently finished.

Before proceeding to describe the Canal, it may be worth while to enquire how it is worked. We see that it is so narrow that two ships cannot pass each other, except at certain sidings, fifteen in number, of which a list is appended to this chapter. At Port Said, Ismailia, and Suez there are principal offices where an exceeding ingenious but simple contrivance may be seen at work. It is locally known as "M. Chartrey's toy," from its inventor, M. Chartrey de Menetreux, the director of the transit department at Port Tewfik, at the Suez end of the Canal.

In a silent chamber in the upper storey of the office, on a low table which fills one side of the wall, is the "toy," a narrow trough of metal about fifteen feet long. On a shelf above it are some fifty model ships, each bearing a national flag. About half the number fly the Union Jack. The trough represents the Canal. There are sidings and stations, and the lakes are indicated by larger openings. When a ship passes the office to enter the Canal, one of the little ships is placed in a corresponding place on the toy, and if a ship comes out the model which bears its name is removed to the shelf above, one man constantly watching the toy, and as news comes by telegraph that such a ship has passed such a siding, the model is moved, and orders are telegraphed directing where she is to tie up. These orders are received at the sidings, and signals to the ship's pilot are accordingly run up. Everything is done quietly and without confusion; and telegrams coming every minute are immediately

noted by the moving of a model ship on the toy and an alteration of the signal—could we see it—perhaps fifty or eighty miles away. From this, it will be seen that ships are piloted on the block system, except in the great lakes where they can pass each other freely, and steam at full speed. At each of the stations or "gares," there are signal posts, from which steamships are directed to "go into the siding" or "go into the canal," as may be required. A full code of these signals by day and by night is supplied to ships by the Canal authorities. Vessels provided with an electric projector that can throw light 1,300 yards are permitted to navigate the Canal by night. It is a fine sight to see sometimes as many as twenty "tall grey ships go on" while you wait at a siding, and nothing gives the traveller so great an idea of British commerce as the fact that something like nine out of ten are going to or from England. It has been found quite practicable to prevent any serious silting of the Canal by the desert sand. The washing away of the banks can also be successfully counteracted by facing them with stone and concrete. All mail steamers now pass through the Canal at night, as well as by day, and seen from Suez, about three miles off, one of the large passenger ships going up or down about, say, nine o'clock, when the short Egyptian twilight has given way to complete darkness, her "projector" lighting up the water-way before her for nearly a mile, with a light like day, and her tiers of ports and saloons all brilliantly shown by electricity rising high above the low sandy banks, is a sight not to be forgotten. Illuminated buoys mark the channel. They are filled with compressed gas, which is always burning, but lasts for about six weeks. The mind will recur to memories of the persistent attempts of the ancients to have a ship canal across this desert. Necho (600 B.C.) made a canal from Suez through the Bitter Lakes to Lake Timsah, and then west to Bubastis on the Nile. Herodotus describes this work with its water gates, and tells us that vessels sailed through in four days. This cutting became choked with sand, but was afterwards cleared and re-opened by Caliph Omar in the seventh century.

The gradual deepening of the Canal will have more effect on the rapidity of transit than any widening or multiplication of sidings. It is easily shown that the narrow water-way is the safest if only there is sufficient depth under the ship. At present a large ship might, but of course with great danger of going aground, put on "full speed," yet without obtaining a single mile an hour more. The propelling power is ultimately, of course, the resistance of the water to the blades of the screw. There is not enough water to allow the ship to go at a greater average speed than five miles an hour. Another reason against unduly widening the canal might not occur to anyone without some practical experience of the traffic. There is frequently a high wind in this part of Egypt; and after we have passed the great lakes we find

that there is a strong tide flowing to or from the Red Sea. I have seen the tide rise six feet and more at the Custom House Quay at Suez. These forces and others act on small steamers more powerfully than on large: and it is found that when the Canal is blocked by a ship getting across or going aground, it is not a great ocean mail steamer but some small collier, or grain ship, locally called a "ditcher," of which hundreds run through every month. Such a vessel as the *Ophir* or the *Ormus* cannot get fixed across the water-way even when handled by a Canal pilot. M. de Lesseps, by whose marvellous perseverance this great enterprise has been carried through, chose the *Austral* of this line, as perhaps the largest steamer passing regularly through, from which with his staff to survey the projected improvements. I am credibly informed that the idea of any considerable widening was hardly mentioned. The average width is at present a little over twenty-five yards, and is sufficient for ordinary traffic with a due proportion of sidings.

Leaving Port Said, the steamer enters between the long moles that preserve the channel of the Canal, a narrow water-way across the desert, eighty-seven geographical, or about one hundred statute miles in length. The Canal runs first through a wet, flat, sandy plain scarcely higher than the level of the water on the east side, and a little below it on the west side. On the west are the wide swamps and marshes of Lake Menzaleh: wild fowl, including large flocks of white and pink flamingoes, abound; and the thought recurs that these unproductive shallows were once fertile wheat-growing plains watered by the Pelusaic and Tanitic mouths of the Nile. But the sea has invaded and oppressed the rich soil with a coating of sand and salt, burying even the remains of many ancient towns and cities that once flourished there. In steaming through Lake Menzaleh, every one on board watches the wonderful flights and flocks of birds to the westward. Sometimes thousands of pelicans appear sitting so close together that they look like a whitewashed wall at a little distance, and it often requires a strong glass to resolve such a cloud of birds into its component individuals. The spectator is fortunate if a flock of flamingoes rises into the air, because while the flamingo looks white when standing, the under side of his wings when he flies is rosy pink. This is an excellent place to watch for the mirage which is almost always visible as pools of shining water, "where no water is" on the eastern side in the barren desert which extends here some twenty miles to the ruins of Pelusium, and beyond it again to Al Arish and the borders of Palestine a hundred miles away. The mirage sometimes take strange forms, especially if there is a southerly wind, and sometimes it seems as if another ship, the image of ours, sailed alongside. There are many "travellers' tales" on the subject, but

though I have been through the Canal some score of times, I have never seen anything more wonderful than the shining pools described above.

Some ruins of the time of Rameses occur in this desert not far from the Canal. The first station, or *gare*, is at the fourteenth kilometre from Port Said, and is called from a neighbouring islet in the lake to the westward, "Ras al Esh," the Cape of Bread. Next, after two more sidings, we reach, at the forty-fourth kilometre, "Al Kantarah" (the accent is on the first syllable), that is "the arch" or bridge. Here was a low hill, cut through by the Canal. "It is by this natural bridge," says Dr. Wallis Budge, "that every invading army must have entered Egypt, and its appellation, 'the bridge of nations,' is most appropriate." There is an attempt at a town and hotel, and travellers by the small post boat to and from Ismailia lunch here. It is still the most frequented route across the canal into Syria, and a kind of wooden drawbridge crosses the waterway.

Between Al Kantarah and Lake Timsah (the Crocodile) seventeen miles of narrow canal with high banks have to be traversed. The name of the lake is probably a reference to the former existence of crocodiles in it, for it is a mistake to suppose that these animals cannot exist in salt or brackish water. At the commencement there are some difficult curves, and as the regulation pace is slow, it is here that small steamers most frequently ground and obstruct the general traffic. The cutting of this part was the hardest piece of work on the Canal; the ridge of Al Guisr rose from seventy to one hundred feet above the desert, and was penetrated with difficulty. This is the one strip of *terra firma* between the Lake of Timsah and the marshes of Lake Menzaleh. The word "Guisr," properly "Jisr," means a causeway. Along this strip is the ancient desert route to Syria; and at the pontoon ferry fully equipped caravans may be seen waiting their turn of crossing.

At Lake Timsah the accompanying fresh water canal turns abruptly away to the west, along the land of Goshen; and here is situated the town of Ismailia, clustering round a summer palace of the Khedive. This was the centre of the celebrations at the opening of the Canal in November, 1869. The Empress Eugenie and the late Emperor of Germany, then Crown Prince, were among the chief stars of the ceremony. The town was planned and built most artistically, but the drainage was so forgetfully executed that it found its only outlet in the fresh water canal. In the desert sand, or in the saltness of the lake it would have been harmless. In the only drinking water, the consequences were inevitable: Ismailia became fever-stricken, and it is now practically deserted. In 1882 it was galvanised into a brief life of extreme activity when it became the base of Lord Wolseley's brilliant campaign. The canal and lakes were crowded with men-of-war and transports;

the town was filled with all the busy needs of an army of 20,000 men. While Araby and his troops blocked the way into Egypt from Alexandria the British navy seized Ismailia; men and materials were rapidly concentrated: the army pushed along the line of the railway and sweet water canal; the Egyptian lines of Tel-el-Kebeer were stormed at the point of the bayonet, and Cairo occupied without further resistance in a campaign of three weeks.

At Ismailia the railway leaves the line of the Canal; and the desert is entered. From Lake Tismah the cutting goes through Toussoum to the north entrance of the Bitter Lakes, a distance of about nine miles; on either hand is the desert. On the right is situated Serapeum railway station, around which may be found remains inscribed with Cuneiform and Egyptian characters. On February 28th, 1869, the Prince and Princess of Wales "let in the waters" to this portion of the work.

The Bitter Lakes widen the surface, but the available channel is still narrow, though deep enough for a good speed to be kept up. The buoys are 330 yards apart, and the space marked as waterway is about thirty yards wide. The Lakes are the remains of a dried-up arm of the Red Sea on which once flourished the ancient port of Arsinoe. To the west is seen the verdured line of the fresh water canal that now runs from the Nile to Suez. Behind this rises the Geneffeh range, affording profitable quarries of limestone and marble and other minerals.

From the Bitter Lakes to Suez the Canal is quite complete with hard banks. At Chalouf the cutting is carried through sandstone, after that to Madama it passes through sand-hills and increases in width; at Madama the banks are of marl or clay, thence to the Suez entrance it runs again through sandhills. The tidal influence in the southern portion of the Canal extends from Suez to about four miles north of the southern end of the Bitter Lakes.

As the steamer enters the Suez roadstead, the eye looks over desert that has always been supposed the scene of the wanderings of the Israelites. A line drawn north from Suez until it touches the Mediterranean, is the geographical boundary between Asia and Africa. Ahead Mount Attaka rises boldly above the sea to a height of 2,700 feet.

For some reason, said to have been political, M. de Lesseps did not bring his canal through the ancient channel and past the old town: but when about five miles off he turned it eastward, avoiding altogether the head of the gulf, through which the direct road would seem to have led. Thus it comes to pass that the famous Suez Canal never goes to Suez at all, but has had formed for it a port of its own, about three miles from the head of the gulf at the end of the fresh water canal, surrounded with land but partly reclaimed from the sea, and destined, it may be believed, to become

one of the great maritime and commercial cities of the world, though at present it only contains the offices of the Canal, a couple of private offices, and the little wooden houses of the pilots. Its official name is Port Tewfik, but locally it is always called Terreplein. The southern offices of the Canal Company are here, on the edge of a green and pretty double avenue of lebbek and sont trees. A tall signal tower shows the state of the traffic by means of balls and flags. In a garden in front is a colossal bronze bust of Lieutenant Waghorn, the spirited projector of the "Overland Route" which led eventually to the making of the Canal. It is inscribed to his memory by the company and has on the base a relief representing him embarking at Suez with the mails in an open boat, an incident which actually occurred.

At Terreplein the quays swarm with the celebrated donkeys and no less celebrated donkey boys, both lively and lusty of their kind. The visitor will be favourably impressed with these specimens of the fine physique of the desert fellaheen, and he will see that in Egypt the dry heat does not prevent the growth of muscles and stamina. Humour is apparently an invariable attribute, and much fun accompanies the scamper from the quays to the "city." Visitors should refuse to mount a donkey which has been galled by the saddle.

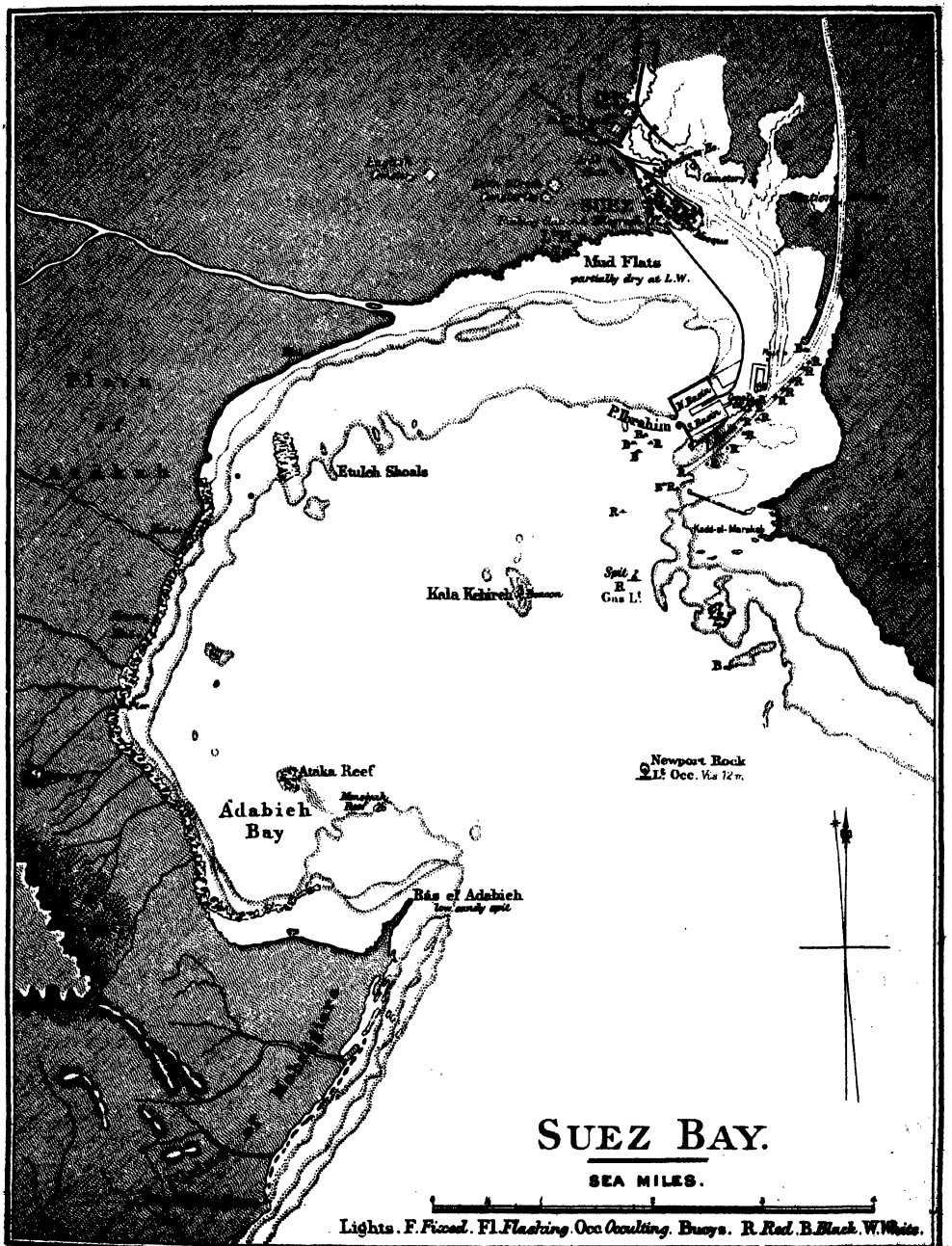
History gives details of Egyptians, Israelites, Phœnicians, Greeks, Romans, Mohammedans, Turks, Venetians, Portuguese, Italian, French, and English, as successively utilizing Suez in their migrations and their commerce. The docks and quays of Terreplein are necessarily European in character; but the visitor will find more to interest him in the narrow alleys of the old town. The ornamental lattices are a feature in the house architecture. From behind them womankind may look on the gay world unveiled but unseen:—

"Spectatum veniunt at non spectenter ut ipsæ."

A visit to the desert, including an evening stroll, will give the visitor a sample of desert life and its monotonous surroundings. Westward of the town a fine view may be obtained by ascending a conspicuous mound, on which there is a flagstaff and a ruinous villa, placed there by the first Khedive. The mound is believed to mark the site of the Roman city of Clysma. There are 14,000 inhabitants in Suez, and several buildings are dignified with the name of hotels; but the time honoured "Suez Hotel," near the water side and the old railway station, has been given up, and exists no longer except in the countless descriptions of the former "Overland Route," when travellers came across the desert from Cairo on horseback, and in wagons drawn by mules, and longed for the sight of "Temple Bar," as the old gate, now gone, was called, and of the comfortable hotel beyond. Part of the building is made into three or four separate residences, and a convenient chapel has

been fitted up where an English chaplain celebrates divine service twice on Sundays. The English inhabitants are in part coaling and other mercantile and shipping agents, and the staff of the Eastern Telegraph Company, besides Government officials.

The fresh water supply is by means of a canal from the Nile. The local wells only yield brackish water, which is often offensive in taste and smell though clear as crystal. The whole of the country is slowly emerging from the sea—hence its sterility and saltness. The town of Suez, a seaport in the sixteenth century, has still deep enough water at the Custom House quay on its northern face for the largest of the picturesque sailing *dhows* which come up the Red Sea with coffee, spices, gums, senna, rose leaves, and all the other drugs and perfumes of Araby-the-Blest. The formation of the Canal gave a great impetus to trade at Suez, but the war in the Soudan has diminished the Red Sea traffic. The older canals all probably ran close past the northern face of the town. The Pharaoh Necho (610 B.C.) commenced a canal from the Nile to the Red Sea but never finished it. Dr. Budge is of opinion that under the Romans there was a canal from the Mediterranean to the Red Sea. Trajan made a canal from the Nile to the Red Sea, and after having long been choked, it was re-opened by Amr, the Saracen conqueror of Egypt. In 1798, Napoleon, whose lodgings are still to be seen in Suez, directed an engineer to survey the isthmus for a canal, but, whether from stupidity or laziness, or pure ignorance, he came to the conclusion that the Red Sea was so much higher than the Mediterranean that on his report the scheme fell through. M. de Lesseps, who was well acquainted with Egypt and with the methods of persuasion which influence the Oriental mind, laid new plans before Said Pasha, the viceroy in 1854. The works were actually commenced in 1856, and seven years later the first necessity, fresh water, was laid on by a canal from the Nile. Some not very creditable traffic in labour, practically in the lives of the unhappy fellah labourers, for an account of which I had better refer the reader to Lady Duff Gordon's *Letters*, led Lord Palmerston and the English Government, as well as all English people who knew the facts, to oppose the further progress of the work. But the happy invention of the great dredgers with thin long beaks, which may still be seen at work here, changed the aspect of affairs. The cutting went on vigorously until on the 18th of March, 1869, M. de Lesseps saw the beginning of the end of his labours, as the Mediterranean water slowly made its way toward the Bitter Lakes. By November the two seas were joined, and on the 16th the canal was formally opened for traffic by the Empress Eugenie. Subsequent events need not be detailed here. Suffice it to say that the canal devised and carried out by the French soon showed itself to be a



HAGUE & SON LITH. LONDON.

highway for English commerce, and now seventy-five per cent. of the ships using it are British and five per cent. more are plying to or from British ports. A greater stake in the Canal by the purchase of shares, and a larger influence in the management by the appointment of English directors in Paris, have added to our interest in this colossal undertaking.

From Suez Bay the steamer enters the gulf of the same name, passing on the east the tall palm trees of the oasis known as Moses' Wells. A little further south is an isolated mountain known as Jebel Sudur, a name which to the Scotsman will recall the "Paps of Jura," in the western Highlands. English sailors, however, call it Saddle Mountain. It has a tragic interest for us. It was here that Professor Palmer and his companions were murdered in August, 1882. The Gulf of Suez is from ten to twenty-five miles in width. On either hand mountains, tablelands, and bold ridges three and six thousand feet high, challenge admiration, not only for their picturesque outline, but also for their marvellous colouring. To the eastward is the Peninsula of Sinai, on the southern part of which Jebel Katharina rises to a height of 8,630 feet.

The long low line of grey hills on the east, across the Canal, is Jebel Raha, the "Mountain of pasture," and flanks Badiet al Tih, or the "Desert of the wanderings." The peaks, only visible in clear weather, in the background form Jebel Moosa, the "Mountain of Moses."

NOTE ON THE STATIONS IN THE SUEZ CANAL.

Kil. 14 (from Port Said) Ras al Esh ("The Cape of Bread").
Kil. 24.
Kil. 34.
Kil. 44, Al Kantarah (in Arabic, "an arched bridge").
Kil. 54.
Kil. 64, Al Ferdane ("The Solitary").
Near Lake Timsah, Madama.
End of Lake, Sheykh Ennedeh.
Toussoun.
Serapeum.
Kil. 95, Diversoir.
End of Great Lake, Kabret.
Kil. 133.
Kil. 146, Chalouf.
Kil. 152.
Suez.

CHAPTER VII.

FROM SUEZ TO CAIRO.

EGYPTOLOGY.—ISMAILIA.—TEL EL KEBEER.—A TIMELY COMET.—JOSEPH AND MOSES.—ZAGAZIG.—THE SACRED CAT.—THE DELTA.—THE FELLAHEEN.—THE INUNDATION.—CAIRO.—THE NILE.—THE PYRAMIDS.—THE SPHINX.—THE GIZEH MUSEUM.—THE ROYAL MUMMIES.—THE BAZAARS.—THE CITADEL.—A WARNING.—LANDMARKS IN THE RED SEA.

THE tourist who comes fresh from Australia or New Zealand and wishes to see the wonders of the Old World cannot do better than begin with Egypt. This is especially the case if he happens to have a taste for history, or a taste for art. The earliest history of which we know much is that of Egypt. The oldest works of art which have come down to us were made by the ancient Egyptians. There are no writings elsewhere in the world which are known to date before hieroglyphics. All the great pictures and statues we shall see in Europe, all the beautiful buildings, must be traced to beginnings on the banks of the Nile thousands of years before any of the other people inhabiting the Mediterranean shores had attained civilisation. All our alphabets and modes of writing can be shown to take their rise from the hieroglyphic forms first used to record their ideas by the ancient Egyptians. Of late years the researches of scholars have been rewarded with a success which was long denied to them. Frenchmen and Germans were long engaged in an amicable rivalry in the interpretation of old inscriptions and the discovery of fresh historical treasures. The French school has, however, greatly declined of late, and is at present almost extinct. Foreign universities have long distanced ours in a branch of knowledge, the foundations of which were laid in England and by Englishmen. A professorship has been founded in London and the study of Egyptology has considerably extended during the past few years; some excellent scholars are to be found in private life. The subject would be admirably suited to the universities of Australia, which would find an open field unoccupied by the older institutions at

home, though even better calculated than the study of ancient classics for ripening the mind and cultivating the mental powers.

Apart entirely from any dry or scientific view of the subject, a visit to Egypt offers attractions to the modern traveller of the most varied and fascinating character. Everyone has heard of the pyramids. Everyone has read the *Arabian Nights*. The pyramids stand in sight of Cairo, the capital of Egypt. The scene of half the Thousand and One Chapters is laid in its streets. The winter climate is the most perfect for almost all classes of invalids. Modern civilisation has penetrated so far that we may make the whole voyage to the second cataract—nearly a thousand miles from the sea—in a steamer, or partly by steamer and partly by rail, while hotels quite equal to those of Europe exist at Alexandria, Cairo, Thebes, and other places. The novelty of mixing with Orientals, of coming into direct contact with oriental life, of hearing a tongue so utterly unknown to most of us as Arabic, of witnessing the exercise of Mohammedan devotion, and of observing the character of a civilisation older than our own, yet in every respect different, is an experience in itself so interesting and so strange, that it is not possible to imagine any better embodiment of the doctor's favourite prescription, "change of air and scene," than a visit to Egypt.

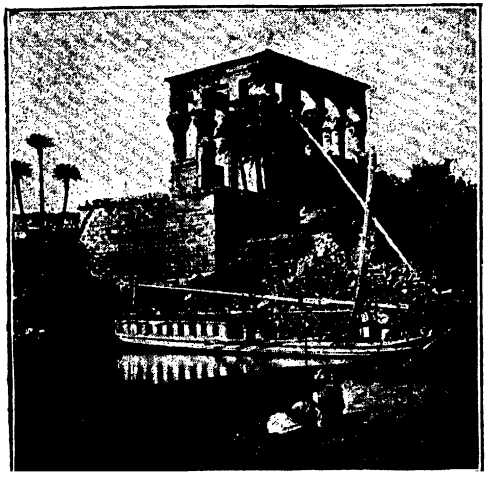
Though Cairo is only about sixty miles in a direct line from Suez, the railway passes round by Ismailia and Zagazig, thus making the journey a long one. The train is very slow, but under English influence the speed has greatly increased of late, and the carriages have been made much more comfortable. We may start if we please from Terreplein, and see in passing the shabby little shed which does duty for a station, the older station at the other side of the town being now virtually abandoned. A mound marks the site of the Roman Clysma. At its foot were buried the soldiers shot by Buonaparte, in 1798, "pour encourager les autres." At the opposite side of the line is a curious little domed tomb. It marks the grave of a great Sheykh, one of the Erbaeen, or forty original supporters of Mohammed. A little further the line bends to the right round the Victoria Camp. The first fifty miles or so are along the desert, with fine views here and there of the Canal, and as we approach Ismailia, of the great Bitter Lake and Lake Timsah, both of them fine sheets of salt water, and only wanting a little more vegetation on their shores to be really beautiful. Ismailia was for a time expected to become a pleasant seaside or lakeside health resort, and had good hotels; but some years ago, an outbreak of fever occurred, of such virulence, that the prosperity of the place was suddenly but irretrievably ruined. During the war of 1882, it became, as has been said, the base of Lord Wolseley's operations. Here the railway turns abruptly westward. One of the first stations we reach after we leave Ismailia is Tel-el-Kebeer, "the great mound,"

which is supposed to cover the site of one of the "treasure cities" built by the Israelites of the Captivity. Here Araby's troops were finally defeated, although they had raised great entrenchments. The battle commenced very early in the morning of the 13th September, 1882, when the British troops under Sir Garnet Wolseley (now Viscount Wolseley) left their camp at Kassasseen in strict silence, and marched by star-light on either side of the canal, which we see from the railway. The rebels' chief entrenchment was to the right of the line. In the General's despatch he says the enemy were completely surprised, and it was not until one or two of their advanced sentries fired their rifles that they realised that the British forces were upon them. The works, which are now almost obliterated by the drifting sand, were speedily lined with Arab soldiers, who fired at our advancing lines, made dimly visible by the dawn, and by the remarkable southern comet (β 1882), which appeared above the eastern horizon, and deceived the combatants into an idea that the sun was rising. Victory soon declared for the British forces; after fighting for twenty minutes the Arabs fled precipitately, their general, Araby, having already set them the example and run away, literally, without his boots. (See Royle's *Campaigns*, i. 325.) The English loss in killed and wounded was 459, the Egyptian loss being set down at about 2,000. The whole rebel army was dispersed. Cairo was taken on the 14th.

Modern research has been very busy with the history of Joseph, the Captivity, and the Exodus. Joseph is believed to have come into Egypt during the reign of a monarch who was one of the last of a long line of foreigners, the so-called Hyksos, or Shepherd Kings, who dominated the country, especially that lower part of it which we call the Delta (because it is triangular in shape, like the fourth letter of the Greek alphabet), after the time of a great native royal family, known in history as the Twelfth Dynasty. So long are the periods of Egyptian history, that it has been found convenient to refer to different epochs by the number of the dynasties, or royal families who successively occupied the throne. Mena, the first king of whom we have historical knowledge, founded the first of these dynasties. Joseph's brethren, then, were settled in the eastern valley, or arm, of the Delta, along the banks of a canal which, even at that early date, ran from the Red Sea to the Nile. After the time of Joseph, a race of native kings, reckoned by historians the Eighteenth Dynasty, rose against the Hyksos, and drove them out. The Eighteenth Dynasty was succeeded by the Nineteenth, one of whom, the third king, is supposed to have been the Pharaoh "which knew not Joseph" (Exodus i. 8). His name was Rameses II., and we shall find the monuments of his power and greatness all over the country. His daughter it must have been who found and brought up Moses;

and to this day the modern Arab inhabitants of Cairo point out a place on the island of Roda, in the Nile, close to the city, as the exact spot where the princess "came down to wash herself at the river."

"In process of time," the sacred narrative continues, "the King of Egypt died." He had reigned sixty-seven years, and had mightily oppressed the Israelite colony in Goshen. The new king was the thirteenth son of Rameses II., and was named Merenptah. He has left us no account on his monuments of the Exodus, but we are aware that other misfortunes beside his defeat at the Red Sea overtook him, and that the prosperity of Egypt under him began to decline. The famous crossing of the children of Israel probably took place below Suez, where, before the making of the Canal, there was a passage fordable at low water, but exceedingly dangerous in certain winds. A great German writer has formed a theory that the Israelites crossed an arm, not of the Red Sea, but of the Mediterranean, but recent authorities have refused to accept his opinion.



ISLAND AND TEMPLE OF PHILŒ, EGYPT.

We now approach Zagazig, a large modern Arab city. Here a handful of the British troops, after the fight at Tel-el-Kebeer, performed a brilliant feat of arms, intercepting and dispersing five trains full of Egyptian soldiers. The railway stations are crowded with the long-robed and turbaned native merchants and their bales of cotton and sacks of wheat carried on asses. Reuben and his brethren must have looked just like some of these men. We can fancy Benjamin, a brown-faced boy, in loose garment and bare feet, following his elders, with a sack like theirs. But we are recalled from speculating if the silver cup is in it by the offer of oranges which a pleasant-looking little girl in blue insists on our buying, or by the earthen bottle of cold water which another offers to pour over our hot and dusty hands.

The great brown mounds which we have just passed on the left, and which stretch away for miles to the southward, are the remains of what was once Pi Bast, now Tel Basta, the city sacred to Bast, the holy cat, whose worship was nearly as

extensive in ancient Egypt as that of Apis, the bull of Memphis. The ruins are composed of crude, that is unbaked, brick, and are constantly being dug down by the farmers, as the dust forms a valuable dressing for the fields. In these diggings innumerable images of Bast, in almost every conceivable material, are found, some larger than life, some small enough to hang at the watch chain. The site of the city has been in part explored by M. Naville, who has found the Temple of "the sacred Cat, the lady of the White Crown."

We are now really in the Delta. The ancient name of Egypt was "Kam," which means blackness. We see its significance now. Wherever the ground is turned up it is like peat. The contrast of this blackness with the green of the luxuriant crops is very striking. If we watch the smaller canals, along whose banks the train goes, we shall see specimens of the lotus-flower, a pale blue water-lily. The air is full of birds, many of them strange to us. The hawks are numerous, from the great kite down to the little kestrel, or windhover, which the ancient Egyptians worshipped as Heru, or Horus. Following the ploughman are flocks of the little white cranes, called by the Arabs Aboo Goordán, and by us the paddy-bird, or buff-backed heron. We can quite understand, as we watch them flitting about, that the ancients used the figure of one as a hieroglyph for "Ba," the soul. Long strings of camels carry green fodder, or canes, or corn; a man on a donkey, with a child in his arms, goes by, with his blue-robed wife following him on foot. Sometimes it is she who rides, which she does seated astride. The *Fellahs* are a cheerful folk, and as they go they talk and laugh as if the tax-gatherer, the usurer, and all the other enemies of the poor in Egypt had never existed. Their demeanour was just the same when they were so shockingly oppressed by Ismail Pasha. At present they have more solid cause for cheerfulness, as, under English influence, and in spite of the surly opposition of the French, forced labour has been practically abolished, the land tax is scarcely more than half what it was, the oppressive salt tax has been largely reduced, and the quality supplied under the government monopoly improved. The imports, both of Manchester goods and of building timber from Trieste, has immensely increased, than which nothing can better demonstrate the increased prosperity of the people, to whom neither clothes nor houses are a necessity.

Agriculture is, of course, the main business of Egypt, and the soil of the Delta is, perhaps, the most fertile in the world. It is always supplied with water by innumerable canals, annually filled when the Nile is high, and gradually diminishing till the inundation commences again in June. As the canals go down, the character of the crops is varied, but three distinct harvests are commonly taken off the same

ground if it is artificially watered. This is effected, for the most part, in a very awkward and clumsy manner by means of the *sakeeyeh*, or water wheel, and by the *shadoof*, or leather bucket, worked at the end of a pole balanced on a horizontal bar. But in Lower Egypt steam pumps are now becoming very common, as are also windmills, which act extremely well, as a perfect calm is very rare, and as the wind blows pretty steadily for an average of nine months in the year from one quarter, namely, the north. The Nile and its inundation are objects of constant interest and solicitude. A low Nile means something like starvation for thousands. The cause of the inundation is the heavy rains of Central Africa. The Nile receives no affluents for the last 1,800 miles of its course, but is constantly feeding canals and reservoirs, so that by the time it arrives at the Delta very little of the original river remains, and the two mouths of the Nile, flowing into the sea respectively at Damietta and Rosetta, are inconsiderable streams. The average difference between high and low water is about twenty-six feet, and in Upper Egypt, where it is permitted to flow over the land, the towns are raised on high mounds to protect them.

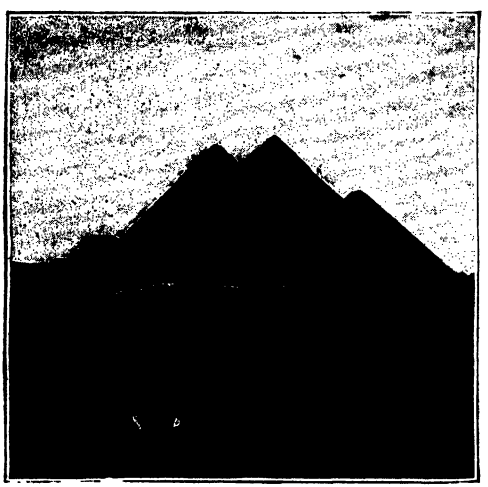
There are plenty of excellent hotels in Cairo. If we would see fashionable life, we may go to the "Continental"; if we would have comfort and quiet, there are several others, such as the "Nil," in the old town, near the bazaars. The scene at the railway station is one to remember. The many coloured dresses, the many coloured faces, the mixture of eastern and western manners, the noise, the dust, and the soft golden light of evening over it all, are unlike anything else in the world. The modern part of Cairo is not beautiful, though much improved in the last few years. The streets are too wide for a hot climate. Constant watering will not subdue the dust. The trees give but little shade under a vertical sun; and we are glad to escape from the glare into the old town, with its narrow winding lanes, sometimes roofed over, and its red and white mosques with their picturesque minarets, and the comparative stillness of unpaved roadways.

If there be sufficient time at disposal, the best way to see the wonders of Egypt is to take a sailing boat, or *dahabeeah*, up the Nile. The voyage to the second cataract and back occupies about three months, and is, on the whole, very pleasant, very healthful, and moderately cheap. An alternative method is by one of Cook's steamers, which "do" the Nile in a superficial style in forty days. A third plan is to go by rail as far as Girgeh, where the railway terminates, about 350 miles above Cairo, and on by the postal steamers, which run twice a week, but only allow of a visit to some of the principal objects of interest.

As it would obviously be impossible within moderate limits to give any account of the Nile voyage, some particulars of what may be seen during a few days' stay in

Cairo must suffice to show the reader how much he will find to enjoy in a visit to Egypt.

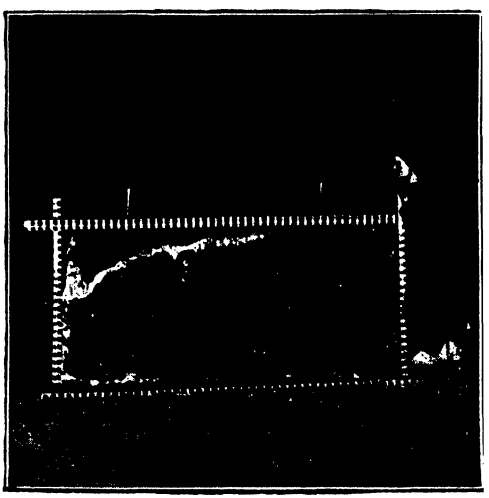
The Pyramids of Geezeh, or Gizeh, are about seven miles from Cairo, at the other or western side of the Nile, which is here a broad and magnificent stream. The road, one of the few roads in Egypt, crosses it by a fine iron bridge, part of which opens for an hour every day to permit the passage of boats up and down. The road for the rest of the way is bordered by trees, which somewhat intercept the view of the pyramids, and as it runs in a straight line for the last four miles, we only gain occasional glimpses of the gigantic cairns till we are quite close to them. Far away, near the horizon, on the left, we can make out the pyramids of Sakkara and Dashoor. A little nearer are those of Abooseer, and still nearer, but less visible, owing to their ruinous state, those of Zowyet-el-Arrian. There are, in fact, about sixty pyramids in Egypt, of which number those of Gizeh are the nearest to Cairo, and the largest.



PYRAMIDS OF GIZEH.

There is now no longer any doubt that every pyramid was built as the sepulchre of a king. But as the kings of the pyramid-builders reigned at a period so remote that some have not hesitated to date it 6,000 years ago, and as very few records of their time have come down to us, it was not at first very certain that they had not some more useful purpose than merely to contain the body of one person, however great. As our knowledge increases, it becomes, however, more abundantly clear, that the people of that time worshipped their king as a visible and incarnate deity, paying him the most extravagant homage, and obeying him without hesitation, even in such folly as the building of a pyramid. The first pyramids were built as early as the time of Ata, the fourth king of the second dynasty. The pyramids of Gizeh were erected by three of the kings of the fourth dynasty. A long period therefore elapsed before they were brought to the perfection we see in these later ones, and among the forty or fifty ruinous heaps which once were pyramids, we have abundant evidence that the art of building for eternity was not learned in a day.

There are nine distinct and but partially ruined pyramids on the summit of the bluff before us. We are able to identify the personages for whom they were built with some amount of certainty, though no record is carved on any of them. The nearest, which, though not now the highest, is always called the "great" pyramid, has been attributed to a king named Shoofoo, or Chufu, whose royal title appears painted, apparently by the masons, on some of the stones of the interior. He is called by the Greek historians, Cheops. Of his life and reign we have a few particulars. He succeeded the first king of the same dynasty, Seneferu, whose pyramid is at Maydoom, about fifty miles up the Nile, and married the widow of his predecessor, by whom he had several sons and daughters. Some of them are buried in the cemetery which surrounds the pyramid. He reigned for sixty-three years, during which he employed his subjects in erecting this stupendous monument, and as a modern author has observed, the echo of the cries of his oppressed people still resounded in the time of the Greek historians who visited Egypt. On the other hand, it must be remembered that the life and treasure spent in even a very short war would build a pyramid greater than this. The times of Chufu were probably very peaceful, though he and his predecessors are both represented on the rocks of Sinai as smiting down their enemies in battle; population and food were abundant; while the neighbouring nations had not yet learned of the wealth of the Nile Valley.



COFFIN IN GREAT PYRAMID.

The beauty of the construction and the great size of the pyramid of Chufu are alike remarkable. The stones of the entrance passage, and the enormous black granite slabs, of which the principal interior chamber is built, are so closely jointed that even a penknife cannot be inserted between. The sides of the pyramid are so carefully faced to the four cardinal points of the compass, that we are not surprised to hear that its ancient name was *Khut*, the "horizon." The whole mass which covers 13 acres, and is still 460 feet high, or 100 feet higher than the dome of St. Paul's, contains only three small chambers, the largest and best constructed of which

measures only 39 feet by 17 feet. In this, which is called the king's chamber, is an empty sarcophagus of granite, the lid of which is lost.

The second pyramid rises at a steeper angle than the first, and stands on higher ground; but is very inferior in construction, the stones being comparatively small, and ill-jointed. The ruins of a temple, which was attached to every pyramid, still remain at the eastern side of this one, and a stone was lately found in it which bore



THE SPHINX.

the name of *Chafra*, the third king of this fourth dynasty, thus confirming the Greek attribution of the pyramid to Chephren. From the entrance of the temple a long causeway or paved path of white limestone leads at a steep slope to the foot of the hill, where it enters a very curious building of red granite and alabaster, constructed below the present surface of the ground, and evidently at once a temple and a tomb. Here no fewer than nine statues, carved with the name of Chafra, were discovered.

The third pyramid is the best built in many respects, but it is very small in comparison with its gigantic neighbours. In it was found the wooden coffin of a king named Menkaoora, probably the Mycerinus of the Greeks, who was the successor of Chafra, and whose body was in the coffin. Both are now in the British Museum. The six smaller pyramids were constructed for the queens and other members of the royal family, and on one of them was recently found the name of a daughter of Chufu, the princess Hentsen.

Next in interest to the pyramids is the Sphinx, a colossal statue of a sitting lion with a human head, carved out of the solid rock of the hill-side. It presents as now seen no feature older than the time of Thothmes IV., a king of the eighteenth dynasty, who left a long inscription respecting a dream he dreamt, while reposing in its shadow. The French archæologist, Mariette, suggested that the Sphinx is the tomb of an early king, but this is very unlikely.

In addition to the pyramids, an immense number of tombs may be visited in the same part of the cemetery of Memphis. They are carved with pictures of agricultural life, exactly like what we saw by the roadside as we came through the Delta, and with long inscriptions in hieroglyphics, describing the owner of the tomb, his birth and parentage, his wife and children, his public employments, his immense possessions, but above all, the fact that he was in favour with the great god, King Chufu, or Chafra, or Menkaoora, as the case might be.

Such are a few of the attractions of an excursion from Cairo. Creature comforts need not be neglected, for one of the best hotels in Egypt stands to the right of the road in the desert, near the pyramids, and is worthy of a visit if only to see the Dining Hall, a building in a Saracenic style, by Mr. H. Favarger, of Cairo, which is most pleasingly proportioned. If, after lunch, we have had enough of the pyramids, we can look in at the Gizeh Museum, about half-way between the pyramids and Cairo, near the prosperous suburban town of Gizeh. In the green fields here and under the lofty palms, Lord Hutchinson encamped his little army, fresh from the victory in which Abercromby was killed at Alexandria. Hence the French, who occupied Cairo, and numbered about a third more than the English, were summoned and surrendered, rather to Hutchinson's surprise, and were marched in relays to the coast, the general's chief care being that they should not know how greatly they outnumbered their captors.

One of the benefits of the present English occupation has been the removal to Gizeh of the priceless treasures accumulated at Boolak by Mariette and his assistant, Herr Emile Brugsh. The Museum was one of the palaces built by the Khedive Ismail, who kept here immured more than 300 Circassian and other slaves.

After his deposition, they were married by his successor to officers in the Egyptian army. It is often asserted that their discontent in their new homes was the ultimate cause of Araby's rebellion, which is likely enough.

It is better, however, not to visit the Museum when we are fatigued by the pyramid excursion, but to devote as much of a day to it as possible; and, in case of a long stay, as many days as we have to spare. The great characteristic of the Museum, that which is not shared by any Egyptian collection in Europe, and least of all by our own in Bloomsbury, is the revelation it makes to us of the art and of the domestic life of the people who lived during the distant and mysterious epoch in which the pyramids were built. The date of that epoch may be very variously calculated. About 4,000 B.C. is usually now assigned to it, but some recent astronomical discoveries would go to make it more like 8,000 B.C., or 10,000 years ago. This is not the place in which to discuss the question. I only bring it in to show that the signs of civilisation here assembled belong to a time thousands of years before anything we know of in other parts of the world, civilised or uncivilised.



GRANITE TEMPLE, GIZEH.

Every tourist who visits the Gizeh Museum ought to grumble because there was till lately no catalogue, and now that one has been issued it is in French, and moreover so badly done as to be practically worthless. The great majority of the objects are not even labelled. The publication in 1891 of a new edition of *Murray's Handbook*, in which an excellent account of the Museum and its contents will be found, should be mentioned here.

Some fourteen chambers are filled with the relics of the pyramid period, relics of which only one or two examples are in the Louvre, and hardly anything at the British Museum. There are "False Portals" of stone, carved, in some cases with the portraits of whole families, in low relief and coloured. Among the oldest is the monument of Ma-anch-Ra, of the time of the third dynasty, the statues of Ra-hetep and his wife Nefert, of the same period, and hundreds of statuettes, among

which, that of Nefer, an architect, is the best. On one monument, probably a little later in date, we see Ra-en-Kaoo, with his twelve sons. His wife A-hat is near, and her two daughters, A-hat and Hetep-hars, are embracing each other. Over each is a long list of the ladies' titles, from which we gather that, as "cousins of the King," they were priestesses of various gods and goddesses, whose cult was specially favoured by the royal family, The statues of Menkaoora, whose body and wooden coffin are in the British Museum, the builder of the third pyramid, in diorite, and that of User-en-Ra, in syenite, are extraordinary works of art, which would make the fortune of an English museum. In one chamber is the dried body—it can scarcely be called a mummy—of King Ment-em-suf, whose pyramid at Sakkara has preserved his name, which does not appear in written chronicles. Near it are part of the skull and the hand, all that remains of Unas, the last king of the fifth dynasty, also from a ruined Sakkara pyramid. Near these fragments of perished royalty is a complete but small tomb of the same period, on the walls of which are sculptured and brilliantly coloured interminable lists of the offerings of corn, wine, ale, beasts and birds, made at the burial of the personage commemorated. The wooden "Sheykh al Beled," Ra-em-Ka, is there, and near him his black wife. There is the archaic stela of Shery, part of which has been at Oxford for two hundred and fifty years, and which, so far, may be considered the most ancient example of the art of writing known to exist. The fragile painting of the pasturing geese from Maydoom has been safely transferred from Boolak. But the number of monuments hitherto wholly unknown to the sightseer which are here exhibited is so great that we pass rapidly by those we knew before. Among these new objects is a very curious statue of Queen Maut-nefert, the hitherto unrecognised mother of Thothmes II. It is of life size, yellow in tint like earlier statues of females, but entirely deficient in everything that constitutes excellence in sculpture as compared with the work of the pyramid period. Nevertheless, this statue, which comes from Koorneh, near Thebes, is of surpassing importance in the history of art.

When we have passed through an open court and round two cloister-like passages, we find ourselves at the foot of a small staircase which conducts us to the great cruciform gallery of the upper floor, in which the royal mummies found at Dayr-al-Bahri have been placed. Here we may gaze at the strangely Jewish cast of the features of the red-haired Rameses, at the short sturdy form of the conquering Thothmes, and at the archaic mummies of the distant seventeenth dynasty, about which the Egyptian historian would so gladly learn more. It seems strange that we may see their very bodies and look into their faces, and yet can tell nothing of their deeds; nothing of the policy or the prowess which made a new Egypt, and founded

the empire of the historical eighteenth dynasty and its mighty successors. The wonderful jewels of Queen Aahhetep are in a room apart, and the innumerable little figures of deities, beads, scarabs, and amulets of all sorts are in the old cabinets from Boolak.

We have thus seen that the student of antiquity may have some pleasant days at Cairo, although we have said nothing of Heliopolis, where Joseph's father-in-law was priest, or of Sakkara, where the oldest tombs and pyramids are found and the stupendous catacombs of the sacred bulls; or of the marvellous quarries at Toora, whence the stone for the pyramids was taken; or, in short, of many other places and things well worth a visit. Let us pass on to see what there is of a more modern kind in Cairo.

The native city is of great size, and contains so many mosques that the people say there is one for every day in the year. The native population is upwards of 350,000. The street scenes are so different from anything in a European city that a walk affords the stranger a series of surprises, and if he has any taste for the picturesque his eyes will be constantly charmed with the most exquisite combinations of colour and form. The main street of the old town is called the Moosky, after its builder, a vizier of the famous Saladin. It was formerly roofed over with great beams, but these have lately been removed and the street has lost its charm, as it is bordered on either side by European shops. Passing rapidly along it, therefore, we come to a street where everything wears a very different aspect. If we go to the right we reach the bazaar for Oriental produce, perfumes, slippers, silk, long robes, red caps, and so forth. If we turn to the left we come to the place where gold and silver ornaments are made, and to the so-called Turkish bazaar, or Khan Khaleelee, where the principal dealers in curiosities have their stalls.

The Khan Khaleelee is of greater architectural pretensions than any other in Cairo, and is a paradise of painters, but the shops and stalls seldom contain anything worth buying. Near the entrance is the carpet bazaar, but, except by chance, you see nothing better or cheaper than what you can obtain in London. About the middle is a very fine pointed arch, over which are hung models of ships. The arch led into the slave market, and the ships were the votive offerings of the pious slave merchants who were anxious for the safe arrival of a cargo of their human wares. The bazaar within was unaltered till the other day. But the wooden cells in which the more precious slaves were confined have now been pulled down, and the place has more the aspect of a cotton market, into which it has been turned.

When we are tired of the bazaar we may ascend, by a long street called the Darb el Vizier, to the citadel. This street is remarkable for the beauty of the

windows of carved wood-work which project overhead. The lattices are formed of round knobs, very ingeniously arranged in patterns. Some of the prettiest have disappeared of late years, and modern French windows with Venetian blinds have taken their place. At one place the street is covered over with boarding. At this point we may stop to see a mosque, that of Ak Sunkur, which is, perhaps, the most beautiful in Cairo for the tile decoration which covers a whole wall. The rest of the building is in a very ruinous state: but as you step over the sill of the door,



THE CITADEL, CAIRO.

you see that it is formed of a column of black granite, covered with hieroglyphics, a relic probably brought from old Memphis, at the other side of the river.

The citadel, in which the palace of Mohammed Ali has been turned into an English military hospital, contains a mosque of great antiquity, and some towers built by Saladin, but the chief feature is the gigantic but unlovely mosque of Mohammed Ali, the founder of the present ruling family of Egypt. The interior is

vast, without being impressive, and a moment's glance shows you that the alabaster lining of the walls is only carried up a little way, the upper part being painted in bad imitation. The tomb of the Pasha is behind a bronze screen. The most beautiful objects in the building are the carpets, with which the whole of the floor is covered, some of them being of a colour and material not now to be obtained. But the great object of a visit to the citadel is to see the view. For this purpose we pass round to the back of the mosque and look over a wall, down at the city below, and across the river, in the distance, to the Pyramids. Sunset seen from the citadel is a sight not to be forgotten, and worth even the price of a chill, which is hardly to be avoided, so suddenly does the heat of day turn into the coldness of night.

A fortnight may easily be passed at Cairo; and the climate is so temperate, often for weeks together without a cloud in the sky, yet, except in the height of summer, pleasantly cool and dry, that no better place can be imagined in which to make a break in the voyage to or from Australia.

In returning to complete the voyage to Australia the traveller may find it convenient to join his steamer at Ismailia, instead of going on to Suez by the dusty train. There is no difficulty about this course: and the hotels at Ismailia, of the usual oriental type, are not inconvenient. It must be remembered that, except to the acclimatised, the drinking water is, to put it briefly, poison, producing both fever and also parasites, including the curious *Bilhargia egyptiaca*, which is said to begin life as a parasite of the mosquito. There is a grim satisfaction in thinking that this odious little pest is itself a subject of attack by a still smaller insect, and we may repeat Swift's famous lines:—

> "So naturalists observe, a flea
> Hath smaller fleas that on him prey;
> And these have smaller still to bite 'em,
> And so proceed *ad infinitum*."

NOTE ON CHIEF LANDMARKS IN THE RED SEA.

Jebel Attaka, "The Ancient Mountain."
Jebel Abu Darraj, "The Father of Steps."
Ras Zaffarana, from Zaffaran, Saffron, the colour of the sands.
Ras al Ashrafi, "The Noble," or "Conspicuous."
Ras Gharib, "The Strange."
Jebel Zeyt, "The Oil Mountain."
Jubal, "The Camel's Hump."
The Brothers, in Arabic, "Achwan."
Sawakin, "The Colonists."
Jebel Tayr, "The Birds' Mountain," or Dokhan, "Smoke."
Jebel Zukur, "The Monument," or "Obelisk."
Ras al Feel, or Fil, "The Elephant's Head."
Ras al Shar, or Asser, "The Saw" (Guardafui).

CHAPTER VIII.

FROM SUEZ TO AUSTRALIA.

THE RED SEA.—THE GULF OF SUEZ.—LIGHTHOUSES.—PERIM.—KAMARAN.—MOCHA.—ADEN.—SOKOTRA.—CEYLON.—COLOMBO.—KANDY.—ATOLLS.—CAPE LEEUWIN.—KING GEORGE'S SOUND.

FROM Suez we pass through a gulf in which we can see land on both sides. The precipitous Jebel Attaka is on our right, but we soon leave it behind, and passing the *Zenobia* lightship on the Newport Rock we are abreast of Abu Darraj, where, according to the local tradition, the Israelites crossed. "Darraj" means a stair, and may refer to the peculiar shape of the mountain. Here, till a passage was dredged, the water was very shallow, and Napoleon with his generals is said to have attempted a crossing on horseback, but was deterred by a change of wind and tide. The first lighthouse, *Zaffaranah*, is on a low spit of yellow sand, fifty miles from Suez, but still within the gulf. The next lighthouse, of iron, is called Ras Gharib, and a fine triple-topped mountain behind it, Jebel Gharib, twenty miles inland, is 5,740 feet high. A still finer view, greatly spoiled by the ungraceful iron lighthouse, 140 feet high, is at Al Ashrafi, a little further on. We have also a fine view of the peaks of Sinai, on the eastern side, and it is said that a glimpse may be obtained in passing of Jebel Moosa, the mountain where the law was given to Israel. We are now reaching the southern end of the Gulf of Suez, and approaching the Straits by which we enter the Red Sea. The gulf was called by the Arab geographers the Sea of Colzoum, a corruption of Clysma, the Greek name of Suez.

The steamer keeps well out to sea, but voyagers by a coasting vessel report that the mountains nearest to the entrance of the gulf consist of a mass of hæmatite of a deep ruddy hue, rising abruptly to a height of 1,530 feet. This is Jebel *Zeyt*, and the region is famous in fable as well as in modern history. It is so powerfully magnetic that it affects the compass of a ship passing near; and the sea in its neighbourhood is often marked with oily patches from the exudation of petroleum.

Great hopes were entertained, and great sums spent on borings here, that the revenues of Egypt might profit, but though a considerable quantity was found, the quality was too poor to make it a profitable article of commerce. The red mountain probably communicated its name to the whole sea, of which it forms the portal; and no doubt some of the wonders of the *Arabian Nights* were exaggerations of the powers of the mountain of loadstone, and of the oily waves.

The old Arabic name is Bahr Melch, or the Salt Sea, but Bahr al Ahmar, or "the Red" also occurs. Yam Sûf, the "Sea of Weeds," is the Hebrew name.

The Straits are called from the island of Jubal, which lies immediately north of a larger and very picturesque island, Shadwan, on the southern point of which a lighthouse, 120 feet above the sea, has recently been erected. The fine mountain above is supposed, in some views, to take the shape of a giant's head and shoulders, and is called Montenegro. When we have sighted it we are well into the Red Sea, and are soon almost or quite out of sight of land.

Next we pass close to two rocky islets, the Brothers, which rise from a depth of 250 fathoms. A lighthouse is on one of them. When we have travelled 300 miles from the Gulf of Suez, and 100 miles from the Brothers, we are abreast of the first cataract of the Nile, at Assouan or Syene, and are almost into the tropics. Here, standing alone in the middle of the sea, is the famous *Dædalus* lighthouse. It rises from the centre of a reef, which is never visible above water, except that some small black boulders rise here and there, and account for the Arabic name, Abu Kizan, "the father of pots." A little masonry surrounds the foundation of the iron framework of the lighthouse, and above it we see the men's quarters. Except in very clear weather this shoal is out of sight of land.

The Red Sea lighthouses, so far, are maintained by the government of Egypt. Four Europeans are attached to each, one, in turn, being always on leave. The loneliness of the situation in such a place as the Brothers or the Dædalus must be extreme, yet some of the men have held their appointments for ten years or more. They are visited once in three months by a steamer, which brings their supply of fresh water, and in addition some of them have condensing machines in case of need. All but the Dædalus bear an excellent reputation for health, but there the climate is hot, damp, and trying. The rest of the lighthouses are maintained by the Indian government, and are periodically visited from Aden. The Turkish government, on the Arabian side, entirely neglects its duties in this respect.

As we pass the Brothers we are abreast of Kosair, an Egyptian port, at the point where the Nile most closely approaches the Red Sea, the caravan journey taking only four days. Here the Indian contingent of the army of Sir Ralph

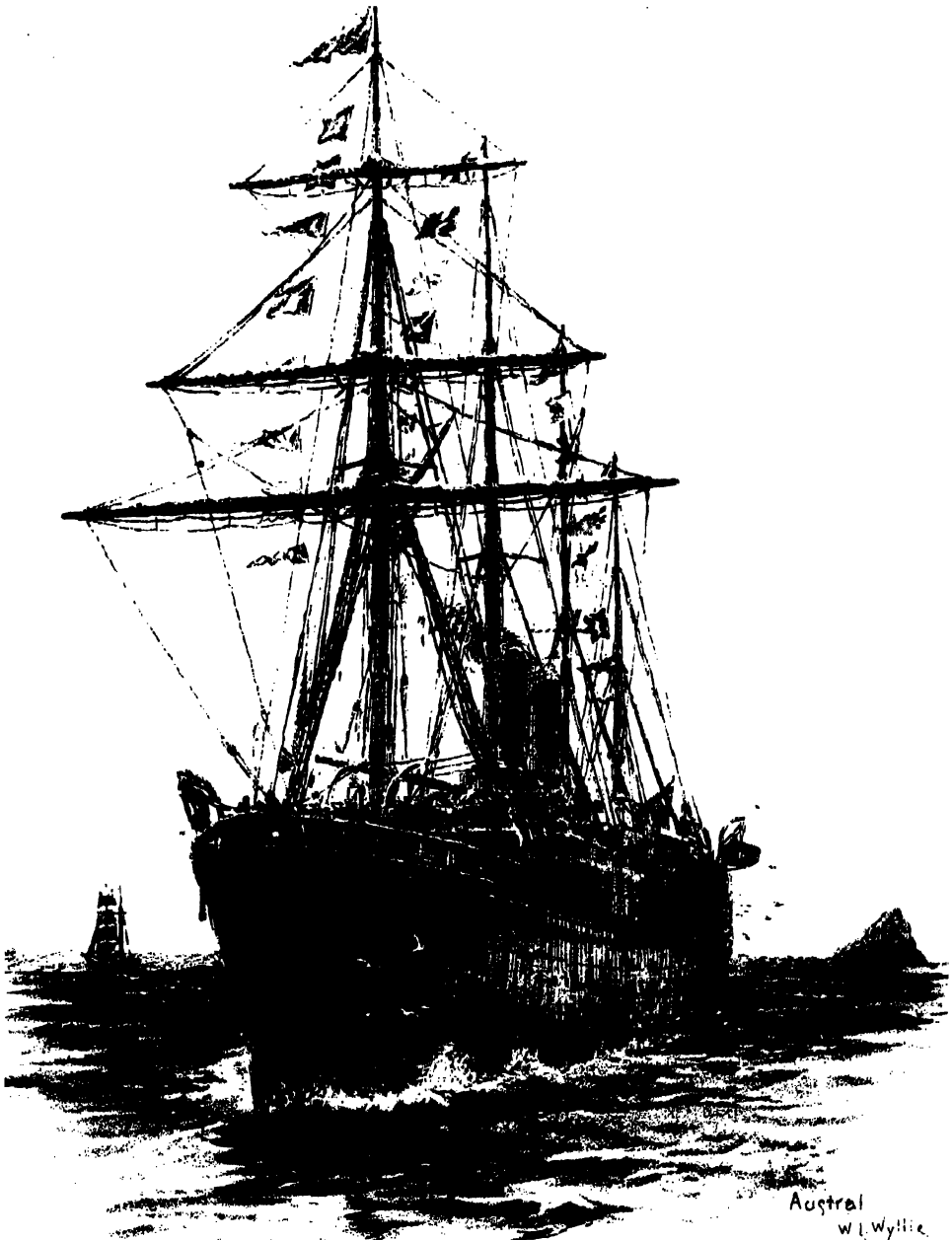
The little island of Perim, forty miles south of Jebel Zukur, guards the entrance. Sir Frederic Goldsmid supplies the following interesting notice of Perim, Aden, and other places in this neighbourhood:—

"In the Straits of Babu'l Mandib (the Gate of Tears), a mile and a half from the Arabian and eleven miles from the African coast, is the island of Perim, latitude 12° 42½′ N., longitude 43° 23′ E., held by a small detachment of British troops, furnished from Aden. Its area is about seven square miles, and it contains barely 250 inhabitants, including the garrison. Long low ranges of hills and salt sandy plains are the distinguishing physical features. The formation is volcanic, and the igneous rocks are covered with a layer of mud described in the official records as from two to six feet in depth, above which is another layer of loose boulders, or masses of black vesicular lava, in some places so thick as to resemble a rude pavement. Altamont, the highest point in the island, selected for the display of a flagstaff, is 214 feet above the sea-level.

"Perim was taken possession of by General Murray, and ceded to the East India Company in 1799, a time when her soldiers were engaged in suppressing the power of Tippú Sahib, and the French occupation of Egypt rendered probable interference by troops from the Red Sea. It was abandoned the same year, as strategically unfit for protective purposes. When Captain Haines reported on it in 1839, he noted a good harbour on the south-west, with an entrance half a mile wide, where were a tank and the 'ruins of a rudely constructed pier—traces of the British occupation.' Being almost surrounded by hills, it affords safe anchorage for ships at all seasons. In 1857 Perim was occupied by Lieut. Templer of the I.N. ship *Mahi*, a French man-of-war arriving a few hours too late. In 1861 a lighthouse was erected on it for facilitating the navigation of the Straits by the many steamers passing to and fro between Suez and the seas to the eastward. In 1885 it was made a signal and telegraph station from which vessels could be reported home. Thus, owing to the convenient distance between the two places, a homeward bound ship passing Aden at night, can notify its progress from Perim in daylight. Barren in respect of grain and earth products, Perim is subject to drought also, and a condensing apparatus has been found the more suitable means of supplying the want of drinking water. The advantage of the position to England is great, both in a political and commercial sense.

"Kamaran, another small island in the Red Sea, some 200 miles higher up than Perim, was occupied by the British Government in 1858.

"Mocha, or Mokha, longitude 43° 20′ E., latitude 13° 19′ N., on the mainland of Arabia, is also north of Perim, but nearer Aden than Kamaran. Once a place of


Austral
W. L. Wyllie

considerable note, if it cannot be quite identified with the old Musa of the Periplus, the sites of the two towns could not have been very far apart. But its importance has much diminished in modern times. At the commencement of the eighteenth century it is said to have had a population of 10,000; and this is reported by Niebuhr to have increased some fifty years later. Another fifty years later—in 1806—Lord Valentia found it an imposing port, with two castles, minarets, and lofty buildings; but the population had decreased to 5,000. Now it is little better than a village; its reputation as the principal port of Yemen resting upon the high quality of the coffee exported, but not from there or, as a rule, anywhere near the sea. The greater part of the 'Mokha' commerce comes from Hodeidah, some miles higher up the coast, a port with a population of 25,000 to 30,000, whence there is a road of 140 miles to Sanaa, the capital of Yemen, through a tract rich in coffee plantations.

"Following the coast line to the eastward from Perim, the traveller soon reaches the Indian Gibraltar—a term commonly, and not inappropriately, applied to Aden, latitude 12° 47′ N., longitude 54° 10′ E. The peninsula bearing this latter name, situated on the south-east coast of Arabia, about ninety miles from the entrance to the Red Sea at Babu'l Mandib, originally formed part of the large province of Yemen (Arabia Felix), but has for nearly half a century been included in British territory under the immediate control of the Government of Bombay. Jebel Hasán (Little Aden), an adjoining peninsula, together with the harbour, are also within British limits. The whole area is estimated at thirty-five square miles, and the population at not less than 20,000 souls, exclusive of garrison.

"Aden is described as a large crater formed of lofty, precipitous hills, of which the highest peak is reckoned at 1,775 feet. These, on the exterior sides, slope towards the sea, throwing out numerous spurs which form a series of valleys radiating from a common centre. At one point there is a gap supposed to be the result of some convulsion of nature. The peninsula is connected with the Arabian continent on the north side by a narrow neck of land partially covered, at high spring tides, by the sea. But a causeway and aqueduct, which supplement, as it were, the natural isthmus, are always above water. The town and part of the military cantonment are within the crater. Stone and mud buildings, of which some are double-storied, constitute the former. In the latter are barracks and mess-houses; but the most important construction is the Court House and Treasury Office.

"The most interesting of the objects to be noticed in Aden are the water tanks, the character of which, both as regards original construction and the additions in more recent days, at once displays the vital importance that has been attached to

providing a water supply in a region such as this. Now that condensers have rendered available the vast ocean itself to quench the thirst of man and serve the many purposes of fresh water to the civilised world, the storage of rain is comparatively of less immediate urgency than heretofore; but with a large and increasing population, in a hot, dry climate, the value of reservoirs is undeniable—and those of Aden have an exceptional claim to notice from an artistic as well as utilitarian point of view. It has been stated that there are about fifty tanks in Aden, which, if entirely cleared out, would have an aggregate capacity of nearly 30,000,000 imperial gallons. The date of the original construction of these is carried back to the second Persian invasion of Yemen in A.D. 600. Many were apparently in fair preservation at the time of the British occupation, but it was not until 1856 that steps were taken to restore them in a manner commensurate with their practical importance. In twenty years thirteen had been completed, capable of holding 7,718,630 gallons of water—little more than a quarter of the ancient computation, but still a respectable supply.

"Much of speculative history has been written connecting Yemen and its people with the Kushite race in the early Biblical ages, and, in process of time, with the Sabæans and Himyarites. During the second quarter of the present century, England had occasion to demand from the Arab authorities of the day satisfaction for injuries to her Indian subjects; when, owing to the failure of negotiations, and treacherous behaviour on the part of the Sultan's son, the port was bombarded and seized by a combined naval and military force, and in January, 1839, it became a possession of the British Crown. This was the first accession of territory recorded in the reign of Her Majesty Queen Victoria. In 1850 it was declared a free port; and the immense development of its trade under its new governors is a matter of sincere congratulation.

"As a military station Aden can hardly be considered popular. Its local attractions are rather for the visitor than for the resident, and its climate, if not comparatively unhealthy, is trying to many.

"Sokotra (between latitude 12° 19′ and 12° 42′ N., and longitude 53° 20′ and 55° 2′ E.) is situated within 150 miles east of Cape Guardafui, and is in the direct route of ships passing to and fro between the Red Sea and India, or countries east and south of the Indian seas. In area it is barely 1,600 miles, the length (82 miles) being reckoned not less than four times the breadth. It became a question whether England should not occupy it in 1800, when the French army was in Egypt. There was, indeed, a temporary occupation by two companies of Bombay Native Infantry in 1835, of which little appears to have been generally known; but the careful exploration of the island in the previous year by Lieutenant Wellsted, I.N.,

had practically anticipated all further geographical research there, and in 1876 it was considered that British interests were sufficiently secured by a treaty with the local sultan who, retaining his rights of ownership, accepted the position of subsidised Feudatory of H.M. Government. In 1887, however, it was formally ceded to England.

"Eastward of Aden extends the long line of coast forming the sea frontier of the large but little known Hadhramaut, of which the principal port is Mukalla. Further to the east, again, and with a sea-front running N.E., and abruptly changing to the N.W., is the Province of 'Oman, in which are the ports of Maskat, Matrah, and Sohar. The first, the head-quarters, or nominal head-quarters of the Imam, is a romantic, though somewhat sombre spot, and possesses mosque and minaret, bazaar, forts, and, among its better class of buildings, a British Residency. It is situated at the extremity of a small cove, of horse-shoe shape, which forms the port, and is the emporium of a large trade between Arabia, Persia, and India. If the streets are narrow and crowded, those who habitually move in them present picturesque figures to the European stranger, and the traffic is genuine and constant. The town is built on a sandy beach, at the opening of an extensive pass into the interior, and on this side of the harbour is the landing place. There is deep water at the foot of the abrupt hills and rocks which flank and overhang the anchorage. Owing to the confined position of Maskat the heat in summer is intense. Cape Masandim, the most northerly point of 'Oman, marks the narrowest passage into the Persian Gulf, and on the coast immediately opposite is the Persian port of Bandar Abbas, a short distance to the S.E. of which is the island of Hormuz."

As one of the ships of this line is named the *Ormuz*, Sir Frederic Goldsmid, who has visited the Persian Gulf, has added to his notes on the western coast the following account of this ancient emporium of the east:—

"Hormuz—commonly written Ormuz—is about twelve miles in circumference, and rather more than four across; presenting to the eye of a visitor from without a mass of hills from 300 to 400 feet in height, covered with an incrustation of salt, amid which are seen higher peaks of pale rock, sharp in outline and precipitous, one, the most central, rising to 700 feet.

"Towards the northern end of the island is a modern village, near the supposed site of the old Arab city, of which a minaret of brick, faced with glazed tiles, about seventy feet in height, still remains. Few other vestiges of a populous resort are here to be found; nor is there any substantial relic apparent on which to support the theory of ancient grandeur! At some little distance, however, there are Arab tombs not without interest, or architectural and historical monuments. Milton must have

given currency to a prevailing notion in the commencement of the seventeenth century when he coupled Hormuz with India as a region typical of wealth; * and the same prestige may have attracted European ships towards it during two centuries preceding. But it is difficult to believe the historian's assertion that the city built by the Portuguese in comparatively modern times became 'one of the greatest seats in the east for splendour and luxury.' At the extreme north, and covering the Arab village and minaret, is an old Portuguese fort, held by a few soldiers on behalf of the governor of Bandar Abbas.

"Old (or the original) Hormuz, founded by Ardashir Babigan, or by Arabs during his reign, occupied, in all probability, the site of Harmozia, a city and capital of a kingdom at the mouth of the Anamis (now Minab river), visited in about 325 B.C. by Nearchus. Its position would thus be on the mainland, east of the island. Local history tells of fifteen kings there, the last of whom flourished in the beginning of the fourteenth century, and was driven by invasions from the interior to find a capital less accessible to an enemy. He first sought refuge in the neighbouring Kishm, but afterwards transferred his domicile to the present Hormuz. Wars with other inland potentates ensued, and eventually possession of the place was obtained by the Portuguese."

The steamer's course now lies for the western end of Sokotra and Cape Guardafui, distant 376 miles from Aden. Cape Guardafui, also called Ras Asser, the north-eastern point of Africa, is a precipitous rocky cape, 900 feet high, frequently enveloped in thick haze, rendering a correct estimation of its distance a difficult matter.

In the channel between Guardafui and Sokotra Arab dhows may often be seen, and thoughts will revert to the liberal support given by England to the suppression of the slave trade, simply in the interests of humanity, and of sympathetic kindness to the various native races of Africa that have hitherto been the victims of this nefarious traffic. Rounding Cape Guardafui brings the steamer into the Indian Ocean, and the course is shaped for Ceylon. If this happens between November and March, or in the north-east monsoon, the new ocean will be pronounced delightful; a clear sky, with a pleasant, moderate breeze, putting every one in a good humour. If, however, the Indian Ocean is entered between May and September, when the

* *Paradise Lost*, Book II.:—

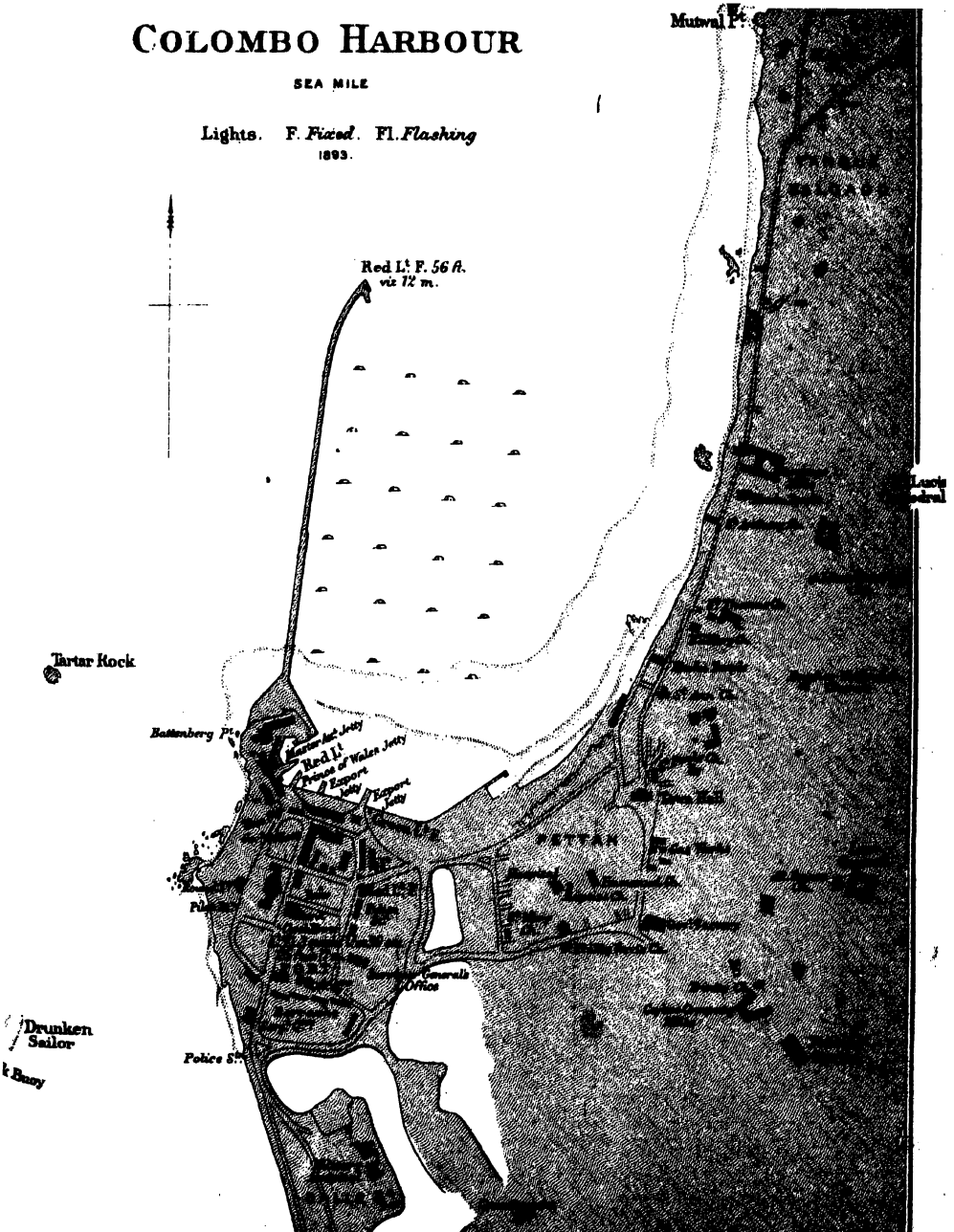
"High on a throne of royal state, which far
Outshone the wealth of Ormuz and of Ind,
Or where the gorgeous East with richest hand
Showers on her kings barbaric, pearl and gold,
Satan exalted sat—"

COLOMBO HARBOUR

SEA MILE

Lights. F. *Fixed*. Fl. *Flashing*

1893.



thick weather and fierce winds of the south-west monsoon prevail, irritable tempers will be a little tried.

Colombo, on the southern coast of Ceylon, is the only Indian port touched at by the vessels of the Orient Line. Here the passenger may decide for himself as to the "spicy breezes" celebrated in Bishop Heber's hymn; and will certainly enjoy the glimpse afforded him of tropical vegetation under the most favourable circumstances. The first thing to strike him, however, will probably, if he arrives at Colombo in daylight, be the magnificent breakwater. It was designed by the lamented Sir John Coode, who has left his mark so plainly on many of our colonies. The first stone was laid in October, 1875, by the Prince of Wales. We have hardly anchored before the decks are infested by crowds of dealers in jewellery, precious stones, tortoise-shell, ebony, lace, and other fancy goods. It is wiser not to buy anything if we are going to land, as at the hotels we shall meet the better class of "tambies," or traders. Even then it is better only to buy under the advice of someone acquainted with the worth of the articles offered. To go ashore, we have our choice of a steam launch at twenty-five cents per head, or of an outrigger canoe. On landing at the jetty a visitor is often surrounded by coolies, offering their services to carry his luggage, but before anything can be removed from the custom house premises it must be examined by the officer in charge of the baggage-room. There is a choice of good hotels for anyone making a stay in the island, one being close to the landing stage, and another about a mile to the southward. Others, perhaps more cool and breezy, are to be found in the neighbourhood.

Although in Colombo itself there are not many objects of special interest, the Museum (closed on Fridays), which is situated in the Cinnamon Gardens, is worth a visit. Opposite the Museum is a statue of the late Sir William Gregory, a former governor, erected by public subscription as a token of the high regard in which his government was held by all people. A visit to the Cotton Spinning Company's Mills at Bambalapitya will be well repaid. They are easily reached by the seaside railway, for which Ceylon is indebted to Sir William Gregory.

The Fort is the most important part of the city, and contains the chief stores, banks, and government and mercantile offices. In Prince Street are the offices of the Turkish Consul, and some of the largest wholesale and retail dealers in general draperies in the town. Here are also the General Post Office and Telegraph Office. At the end of this street stands a bronze statue of Lieut.-General Sir Edward Barnes, to whom the credit of opening up the country is principally due, and by whose direction the road from Colombo to Kandy was made. Then there is the Fort Esplanade, which is laid out as an ornamental garden. In it Sir Arthur

Gordon erected a handsome fountain as his gift to Colombo, in memory of the jubilee of Her Majesty's reign. In Queen Street stands Queen's House, the residence of the Governor when he is in town. The other residences of the Governor in the island are the Pavilion at Kandy, 174½ miles from Colombo, and Queen's Cottage at Nuwera Eliya, which is 128½ miles from Colombo.

Those who have only a few hours to spare will employ their time most profitably



STREET IN COLOMBO.

by driving about in the cooler part of the day. Drive over Galle Face, notice the battery, recently constructed, and the club house, down Colpetty for about half-a-mile, then to the left down Turret Road, through the Cinnamon Gardens, back by Union Road and Slave Island. The Museum may be visited on the way.

Or you might drive from the Fort in an opposite direction, through the Main Street, Pettah. Then proceed through Sea Street, which takes you past a large Hindu Temple, but it is generally very much crowded with bullock carts. The road goes on through Korteboam Street, past native huts, built among the cocoanut palms, to

Mutwal. St. Thomas's College and the Anglican Cathedral (two miles from the Fort) are well worth a visit. The Compound is beautifully shaded by magnificent banyan trees *(Ficus indica)*. Resuming the drive along the shore, in a few minutes you pass Uplands Compound. Here lives an enormous land tortoise said to be over 150 years of age. By permission of the occupant of the house, the lodge keeper is allowed to introduce visitors to this wonderful creature. If time permits you may continue the drive northward, till after a mile or so the road meets the river Kelani. From this a very pretty drive under the graceful areca *(Areca catechu)* and cocoanut palms *(Cocos nucifera)*, leads to the Bridge of Boats, a picturesque arrangement of twenty-one boats over the river Kelani. The scene at the market, which is close by, is often busy and interesting. From the bridge a wide and well thronged road, called Grand Pass, leads back to Colombo.

For those who intend staying a few days in Ceylon there are several places of interest in the neighbourhood of Colombo. Kalutara, the Richmond of Ceylon, is accessible by the seaside railway, and is one of the most beautiful spots in the lowlands of the island, with its luxuriant vegetation, amidst which parrots and other birds, and sometimes monkeys, may be seen playing about. The low country can easily be exchanged for the hills in four hours, by a train which runs through the most interesting country, and up a fine mountain pass called Kaduganawa, and winds up a hill along the side of a ridge, past Sensation Rock. It is one of the greatest railway ascents in the tropics, being 1,600 feet above sea level. The view is splendid of the fine luxuriant country, rich with tropical vegetation, cocoanut and areca palms, paddy fields, flowering trees, etc., backed by lofty mountains.

This brings the visitor to Kandy, the Mountain Capital, a town of 22,000 inhabitants. It lies in a valley on the brink of an artificial lake, and is famous for its exquisite beauty. It has a very good hotel. The Buddhist and Hindu Temples, with the Dalada Maligawa, are well worth a visit. The Dalada Maligawa, or "shrine of the tooth," so called from its possession of a piece of discoloured ivory, two inches long, and as thick as a first finger, supposed to be one of Buddha's teeth, is the centre of an annual festival, when with much ceremony the precious tooth is brought forth from its shrine. The Botanic Gardens at Pérádeniya, three miles from Kandy, are well worth seeing.

Nuwera Eliya, 6,000 feet above the sea, can be reached in nine hours from Colombo. There are several hotels. This is the health resort of Ceylon, the temperature never becoming excessive. From December to May the weather is, as a rule, fine and bright. The mornings are sometimes very cold, though in the middle of the day the sun's rays become powerful. During the rest of the year a

great deal of rain falls, which makes the place less enjoyable. There is a great variety of walks in the neighbourhood, and the ascent of Pidurutalagala, 8,295 feet above the sea level, the highest mountain in Ceylon, is easily made, three hours being ample for the expedition. Or a trip to the far more interesting Adam's Peak can be arranged. The Lady's Waterfall, Blackpool, and the Hakgala Experimental Gardens all deserve a visit, especially the gardens. The Horton Plains, eighteen miles distant, are reached by a jungle path. The scenery here is magnificent. There is very comfortable accommodation at Rest House, and the excursion is strongly recommended to those who have the time to spare.

From Kandy, a trip to Amiradhapura and Polanaruwa can easily be arranged. For sportsmen, there is elephant shooting in the south of Hambantola district, elk, wild buffalo, bear, and cheetah hunting round Nuwera Eliya, and in the forests to the north and east.

Colombo is the capital of Ceylon, and had a population in 1885 of 120,000, which has increased since. Considering that it is only some five and a half degrees north of the line, the climate is marvellously temperate and healthy; but the weather is very hot as a rule in March, April, and May. The distance from Aden is 2,104 miles.

During the rest of the voyage to Australia, the only land sighted will be the islands of the Chagos Archipelago, and even of these we may fail to catch a glimpse. When the Orient Line began to run a coaling station was established on Diego Garcia, one of the group, but it has since been abandoned in favour of Colombo.

Diego Garcia, which is a very typical example of a coral "atoll," formed by a narrow wall of coral surrounding a central lagoon, is thirteen miles in length, and about eight miles in extreme breadth; the entrance to the lagoon being little over one mile in width. The coral wall is generally from three to four, and nowhere more than six feet above high water; but the trees with which it is covered attain in several places a height of 150 feet, causing the island to be visible at a distance of ten miles. A steep coral reef on which the sea breaks heavily fringes the outside coast of the island and renders landing impracticable.

As the ship passes by, several of these curious islands may possibly be sighted, but it often happens that not one is visible. They are all very low, and the palms with which they are covered seem to rise from the surface of the ocean. The coral "insects" build by separating the particles of carbonate of lime from the salt water, and forming them into an agglutinated mass; each generation growing up upon the lime leavings of its ancestors. Occasionally coral is formed round an island that is "subsiding." As such islands gradually decrease in circumference, and as the coral continues to rise perpendicularly on its original foundations, a ring of coral is formed

around the ultimate peak of the subsiding island, and we have what is termed an atoll. A remarkable feature of these atolls is their generally horseshoe shape, with the opening to leeward of the prevailing winds. This is probably due to the general drift of water providing fresh lime to windward, whereas the water which passes to leeward, has, so to speak, been sieved of its lime. The name of Atoll, given to these circular islands, is derived from the native name of one of the Maldive group.

A run of 3,197 miles from Colombo brings the steamer in sight of Cape Leeuwin, the south-west point of Australia, and the beginning of the end is attained. Cape Leeuwin (Lioness), so named by the Captain of the Dutch ship *Leeuwin*, in 1622, is a small round headland fronted by reefs, only forty-three feet high; the land north-east of it, however, rises abruptly to nearly 500 feet, and is visible thirty miles off.

From Cape Leeuwin to King George's Sound, the distance is 158 miles. The coast line is barren but picturesque and of basaltic formation, some of the capes rising perpendicularly from the sea. The views as you approach are very fine, though the highest, Cave Point, is not more than 700 feet high. Keeping Breaksea, where there is a lighthouse, on the starboard side, and watching as you pass the curious effect of the waves breaking into deep caverns and "blowing," like a whale, at the very top of the cliff, you can make out the opening of Princess Royal Harbour, and some higher ranges of mountains further inland, one of which —a long way off—called Bluff Knoll, rises to 3,640 feet, more than the height of Snowdon (3,570 feet). Both on the right and on the left, as the vessel approaches the entrance, basaltic columns are to be seen, and a geologist, when he views the great natural harbour within, is very likely to speculate as to submerged craters, and to think of Messina, and other places of the kind. Once well alongside Breaksea, you are in anchorage, and within the Sound, comparatively safe from the mountainous waves which come up with a south-east wind direct from the Antarctic Pole. The Sound is well marked out with islets and rocks, some of which strangely resemble the castles and towers of the old country, and rise in places more than a thousand feet above the sea. Few, except the largest vessels, are ever moored in the Sound. The harbour is too tempting. As we pass in, the natural strait being only a few hundred yards wide, we find ourselves in another world. We have been contemplating the brown, rugged back of the scenery. Now, we are surrounded by great hills—the greenest we shall see in Australia—and across the two miles of blue water which the harbour encloses, are natural woods creeping up the hill to the south-westward, and only ceasing when they reach the seaward edge of the granite cliff. The town—or, as Australians always say, township—of Albany, is on our right, and

straight before us a wide valley slopes upward, till it is lost in the blue distance about Willyamp and the Porongorup Range. Long before these mountains are reached the traveller will have left the beautiful oasis round Princess Royal Harbour far behind, and a border of yellow desert intervenes between Albany and the next "township" on the road to the capital of the Colony. A railway has been made and now runs 260 miles to Perth, and is connected with the whole Western Australian railway system. Albany, itself, is rapidly increasing both in wealth and population, as it is the first place of call for mail steamers in Australia. They come in twice a week, on the voyage out and the voyage home. There is a long wooden pier, close to which the largest ships may tie up or anchor, and the streets, surrounded by the flowery gardens of many charming villas, may be seen at very close quarters without landing. But it is well worth while to stay a few days, if possible, as the princes did in the *Bacchante*, and as Lord Brassey did the other day in his yacht, the *Sunbeam*. The easily defended character of the place, which the lamented Sir Peter Scratchley termed "the key of Australia," but which might even more appropriately be called its lock—a lock which in its present condition, any warlike key might open,—is very plainly visible. Albany will certainly be a town of importance before long. It has been proposed as the meeting place of the congress of the federated colonies; it is admirably suited from its climate for a sanitarium for India and for other parts of Australia; and above all it is a military and naval position which might be rendered as impregnable as Gibraltar at a comparatively nominal cost.

CHAPTER IX.

NATURE AT SEA.

UNDER THE SEA.—COLOUR BANDS—SEAWEEDS.—LUMINOSITY OF THE SEA.—MEDUSÆ.—MOLLUSCS.—FISHES.—SHARKS.—TURTLES.—CETACEA.—BIRDS.

BY far the longest time out of sight of land comes after Colombo is passed, and when we are out on the Indian Ocean, going along day after day without any change of scene or view, except what is offered by the sea and the sky. This seems to be the place where we may insert a few chapters on the aspects of nature at sea. The notes on "the configuration of the earth under the sea" and natural history are by the Rev. C. H. Middleton-Wake, M.A., F.L.S.

There are few educated readers at the present day who have not acquired some information, however superficial, of the physical history of the earth. The facts are so apparent, the evidence they bear is so overwhelming, that even the least careful observer must be convinced that the relative arrangement of land and water has in times past been widely different from that which now prevails, and will be prepared to acknowledge that the vast changes visible on every side can only have been effected by slow but continuous action, prolonged not for a few short years, but through periods of time too great for our limited conception. There is proof sufficient in our own country of upheavals so vast that the imagination can hardly realize their magnitude; of depressions of land and of denudation—the removal, that is, by water or ice action, of plain or hill or mountain—so extensive that it is difficult for anyone who is not a scientific geologist to realize their meaning or measure the untold ages that have witnessed their completion. Sea shells and marine remains of comparatively recent species are found on the higher slopes of Moel-Tryfaen, in Snowdonia; the greater part of Scotland was, in times yet nearer to our own, more than 2,000 feet below its present level; at some still earlier period, how far back we cannot even suggest, stratified beds of sand and shale and coal, 10,000 feet in thickness, have been planed away from a large part of the district

now known as South Wales, and every foot of clay, of sand, or gravel which fills our English valleys, or crowns her hills, bears witness to the action of ice, or waves, or running water. The possibilities everywhere of alterations in the levels of land and sea must therefore be accepted, and the strange results which such oscillations would effect may be temporarily discussed. With these ideas we will again follow the steamship's track, and endeavour to describe the possible as well as the certain changes which underlie her path.

Before leaving the Thames the outgoing voyager will remark, upon his left, a long expanse of low-lying land behind the tidal embankment, while on his right, at some distance from the shore, he will see chalky cliffs and downs, like those with which, perhaps, he has become familiar in railway journeys north and south of London.

The low-lying lands on the left have in many places been excavated—nowhere more extensively than in the formation of the large docks at Tilbury. There are here three distinct beds of peat, separated from each other by well marked deposits of mud and clay and gravel. These peat beds, as proved by their contents, are of three very different ages. The upper and most recent, now buried beneath a thick clay, was once a forest of birch and hazel, standing well above low water; below it lies a second bed of clay, deposited by some ancient river, which, from hill to hill, filled the whole valley of the Thames—itself but an affluent of some much more important river, that, draining central Europe, found an exit far away in the northern sea; lower still is a deep sand bed, in which, thirty-four feet below the present surface, has been found a human skeleton, the remains, perhaps, of some hunter or fisherman who plied his trade when the mammoth, the cave-bear, and the hyæna ranged freely over what are now the British Isles. The chalk beds to the right have a much earlier history, and tell of far greater changes; measuring in some places over a thousand feet in thickness, they were, as their fossilized contents reveal, deposited beneath the sea, where, for untold ages, they were slowly formed from living coral, and from the remains of coral animals, sponges, and molluscs, and the numerous lime-secreting organisms which to this day abound at varying depths in the open sea. The evidence is irresistible, and in its presence no theory or tradition of the former prevalence of land or sea, where water or hill and valley now prevail, should be rejected as improbable.

Passing the Isle of Sheppey, whose rapidly wasting shores foretell at some distant date its total disappearance, and Herne Bay, a bay whose name is its only memorial, and Thanet, once an island, and steering southwards, at the North Foreland the steamship enters a channel of moderate depth between the Kentish

Cuzco

coast and what are now known as the Goodwin Sands, covered, at high tide, with from one to three fathoms of water. These dangerous sands, in which many a good ship has found her grave, were, says tradition, at one time part of the estates of Godwine, Earl of Kent, the father of the unfortunate Harold, who, on the field of Senlac, yielded both life and crown to William, Duke of Normandy. The destruction of the land was not occasioned by any sudden depression of the country, but is due to the wasting action of the water, such as is perpetually at work along our eastern coast, the final catastrophe being hastened perhaps by some break or fault in the strata; and at the present day beds of shifting sand, below which are found the clays and chalk of the adjoining mainland, are all that remain of what once were fertile fields and woods.

Entering what is marked on the chart as the Straits of Dover, the sea-bed, as compared with the greater depth of the German Ocean, gradually shallows from 120 fathoms to 58, 38, and 18, and in one part to less than 2 fathoms, the dividing ridge following a line drawn between Romney Marsh and Boulogne. From this the English Channel deepens slowly as we proceed westward, so that the submarine banks across the Straits of Dover may be said to part two seas.

At a comparatively recent period, as geologists count time, the Straits and even the English Channel did not exist, and, except that south of Brighton, about half way between the present coasts, the soundings tell of what must once have been a considerable lake extending towards the west, continuous hill and valley connected the British islands with the continent. Of the depression of this whole area now covered by the sea, and of the perpetual widening of the channel by the wasting action of the waves, the English coast-line affords the clearest evidence. There is not a single cliff or headland unprotected by carefully constructed sea-walls, which is not yearly receding. Shakespeare's Cliff at Dover is no longer the "fearful and dizzy height" described 250 years ago. The ancient realm of Lyonesse, known in Arthurian romance, has disappeared, but in almost every bay along the southern coast where fishermen now drag their nets, traces still remain, in some places, as at Torbay, extending above low water mark, of forests which once clothed a pleasant undulating land diversified with lake and running water; it needs but 200 feet of elevation along our southern coasts to displace the sea, though it might not restore the face of the country disintegrated by the wearing action of the waves; while a general upheaval of 600 feet extending over the whole of northern Europe would efface the Baltic Sea and the German Ocean, unite in one country the whole of the British Islands from the Shetlands to the Scillies, and carry the empire of England ten degrees further to the west.

Leaving the English Channel the track of the steamer lies in a south-westerly direction. Passing Ushant on the left, the 100 fathom line is soon reached, and the voyager is borne above the deeper waters of the Bay of Biscay; within a few miles the sounding line would tell of an almost precipitous descent of 1,000 fathoms, and before the lead could be recovered, a still deeper valley of 2,000 fathoms is reached. Soon again the sea bed rises rapidly, and before reaching Cape Finisterra the deepest water has been passed, and the ship's course follows a line of shallower water along the coasts of Portugal and Spain. Two thousand fathoms (12,000 feet) does not measure by any means the deepest part of the Atlantic, but even at 2,000 fathoms it was long supposed that the existence of animal life was impossible. One result of the scientific voyage of *The Challenger* has been to show that the lower forms of life are not injuriously affected by the singular conditions which prevail at so great a depth, well marked and characteristic examples of all the five invertebrate sub-kingdoms having been dredged from 2,400 fathoms. It is an abyss into which not the faintest ray of the most brilliant and unclouded sunshine can penetrate, and where the occasional phosphorescent light of some living organism alone relieves the absolute darkness; and, so great is the pressure of superincumbent water, that, as Wyville Thompson, the historian of the expedition, expressed it, "at 2,000 fathoms a man would bear upon the surface of his body a weight equal to twenty locomotive engines, each with a long train loaded with pig-iron"; the statement, which is not exaggerated, would seem to render all life at these great depths impossible, and it is certain that immediate death would attend either the sudden removal or the sudden imposition of such pressure; mollusca, annelids, and star fish dredged from 1,000 fathoms, are always dead or in a dying state when they reach the surface; the sharks *(centroscymnus cælolepis)* which frequent the coast of Portugal and are taken by lines 500 fathoms long, are invariably brought up dead; but a living creature, whose frame is permeated as well as its body surrounded by an incompressible fluid, is no more conscious of inconvenience than are we ourselves when waking from a refreshing sleep we learn, from the rise of the barometer, that the air pressure upon our bodies has been increased during the last few hours by perhaps half a ton. The profoundest depths of the Atlantic lie to the west, some hundred miles north of the Antilles. At one place nearly 4,000 fathoms was reached and the pressure proved so enormous that strong thermometers specially constructed for deep-sea sounding were crushed as in a vice. A sad incident marked this sounding; the first death on board had taken place from an accident the previous day, and for a poor sailor boy a grave was found in the deepest spot which has ever been fathomed in the ocean.

Just as in the seas which have already been passed through, the bed of the Atlantic wherever it has been sounded is found to vary greatly in depth. Our knowledge of the irregularities is to a large extent due to the careful soundings which have preceded the laying of the Atlantic telegraph cables. One result has been to show that in the neighbourhood of the Azores, of the Madeira Islands, and of the Salvages and the Cape de Verdes, which are more to the south-west, the sea is shallower than elsewhere, and it is possible to map out, though somewhat roughly, more than one plateau at a very considerable elevation above the rest. These discoveries re-open a question which has interested the scientific world for more than two thousand years; it is, whether one or more of these groups of islands which now rise above the waves, are not the few remains of a continent which once assisted to span the gulf between the new world and the old; the fabled, the mythical, yet ever undefined "Atlantis"; the country of which Plato wrote as once existing beyond the Pillars of Hercules, the rocks of Calpe and Abyla, which guard the entrance to the Mediterranean; the land in which were placed the Elysian Fields, and the Garden of the Hesperides; from which the early civilisation of Greece and Egypt, and Asia Minor, were derived, and whose kings and heroes were the Olympian deities of a later time. The legend enshrined in the *Critias* of Plato is of singular interest. It is told as even then an old world story, the repetition of an early tradition, learned by Solon at the lips of the Egyptian priests. It is of a mighty nation who dug canals, built ships and temples and palaces, and in pursuit of trade or warfare extended their empire over the whole of the then known world, but who perished utterly from the face of the earth in a fearful convulsion, when there occurred "violent earthquakes and floods, and in a single day and night the island of Atlantis disappeared and sank into the sea." Of the possibility of such a catastrophe there can be no doubt, the rugged islands that remain are all more or less volcanic, and with the evidence continually afforded, in other parts of the world, of the enormous forces exercised by internal heat in the upheaval or depression of very considerable areas of country, we cannot reject this legend of the destruction of Atlantis on the ground of improbability. It must at the same time be acknowledged that the objections to the theory may not be lightly set aside. Naturalists will contend that, if this continent existed, the flora and fauna of the Eastern and Western Hemispheres would show some closer relationship: and geologists decide that the period of its elevation must have been too remote to have influenced historic times, or have become the subject of tradition. On the other hand there are many mysteries which the former existence of Atlantis would resolve. Among these are the almost universal legends of a deluge, bearing a curious resemblance which it is

difficult to believe are accidental, but which the existence and destruction of Atlantis would explain; there are similarities in custom and modes of worship, in forms of building, and even resemblances in letters and the construction of language, which point to some common origin. The sculptured stones of Asia are rivalled in Central America and in Peru; the pyramid of Cheops is surpassed by the pyramid of Cholulo which stands on four times the area of the building by the Nile. The arched entrance to the treasure house of Atreus at Mycenæ, and the Palenque arch of the Aztecs, as pictured in Baldwin's *Ancient America*, are designed on almost identical lines. The traces of ancient serpent-worship prevail on either side, the stone implements, the stone axes and arrow-heads, sole relics of a primæval people, belong to both shores of the Atlantic; and from this lost continent may have come the more mysterious weapons of bronze, an alloy of copper and tin, whose manufacture it is almost impossible to attribute to the barbarous tribes with whose remains they are preserved. Of these Sir John Lubbock writes, "Not only are the several varieties of celts found throughout Europe alike, but some of the swords, knives, daggers, etc., are so similar that they seem as if they must have been cast by the same maker." Though the question may never be definitely solved, its solution, like the song of the Sirens, "is not beyond the region of conjecture." A hundred years ago the site of Nineveh was little more than a tradition, and the lost cities of Central America were undiscovered; may not the imagination revel in the idea that a hundred years hence the dredge will have penetrated beneath the deep accumulations of dead coral foraminifera and shell-bearing zhizopods which form the floor of the Atlantic, and our museums be enriched with statues, arms, and implements from this long-forgotten land, the suggested locality of Eden, and the cradle of the human race.

Leaving the Atlantic and its mysterious traditions, the Mediterranean is entered by the well-known Straits of Gibraltar. The sea rapidly shallows from 950 fathoms between Gibraltar and Ceuta, until, along a line from Cape Trafalgar to Cape Spartel, a distance of twenty-two miles, a submarine ridge of rock is found, about seven miles in breadth, on which the depth nowhere reaches 200 fathoms. After this the water deepens, until south of Sardinia in about 5° E. longitude, it reaches 10,000 feet. On the "Adventure" and "Medina" banks the water shallows to 200 fathoms, beyond which is the eastern basin, where at a point between Malta and Crete the sounding line records nearly 14,000 feet, "an abyss," says Lyell, "about as deep as the Alps are high." A third range or plateau lies between the Grecian Archipelago and the coast of Africa, and soon a depth of 6,000 feet is reached, but the water again shallows as the vessel nears Port Said. The submarine ridges

at one time formed a land connection between Europe and Northern Africa, the Mediterranean then existing only as three inland seas, and it is confidently asserted that numerous birds of passage still follow those ancient lines of land in their annual migrations. It is probable that at the same period the Sahara Desert was much below its present level, and a continuous sea or strait extended from the Bay of Bengal to the Atlantic Ocean. The bed of the Red Sea is comparatively shallow, and is chiefly interesting in that towards its southern extremity are seen large numbers of massive "coral plants" of a sub-littoral type, which have been growing in their place for centuries. Single corals of the genus Mœandrina and Favia, having a globular form, from six to nine feet in diameter and of immense antiquity, have been observed, "on which," says Ehrenberg, "the Pharaohs may have looked." Beyond Cape Guardafui lie the two islands described by Marco Polo, which the "Salvage men" and their wives inhabited apart, and beyond them Socotra, famous—or rather infamous—for its enchanters, who, he writes, "could make the winds blow as they desired, and produce great tempests and disasters." From this the track crosses the north-western part of the Indian Ocean passing its southern boundary in the line of the Chagos Archipelago. There is a tradition that below this sea lies another buried continent, in which, as in Atlantis, have been localized the four rivers and the pleasant land of Eden, the scene of the creation of man.

The theory of a pre-existing land, as we have already seen, involves no geological improbability; the very formation of the atolls and coral-reefs, with which parts of this sea are studded, requires the gradual subsidence of the land, and in fact, it is known that the whole area is still slowly sinking—from Madagascar and the Mauritius to the Chagos Archipelago and Ceylon, and to the Laccadives and Maldives, off the coast of Malabar, the twelve thousand islands of the old geographers. But compared with the traditions of "Atlantis," the legends of "Lemuria" are few and uncertain, and the extent of this lost country beneath the ocean is even less well defined. On the mountain of Sakya-muni in Ceylon, the ancient Seilan, a *Kist-vaen* or megalithic building was long venerated as the sepulchre of Adam. Expelled from Eden he had found a resting place from which, beneath his feet and stretching far away towards the western sun, he could see the beautiful land to which he might never again return. "There," says a traveller of the 14th century, John of Marignolli, "is the dwelling-place of Adam, which he built with his own hands; it is of an oblong shape like a tomb, made of great slabs of marble laid one upon another"; but Marco Polo, who visited Seilan some seventy years before, and heard the story, declared that, "according to the Scriptures of our Lord, the sepulchre of Adam is not in that part of the world." As the print of Adam's foot

remains, and, varying no doubt in proportion to the faith of the visitor, measures from three to five feet in length, the cautious Venetian showed, perhaps, his better judgment in rejecting the tradition. Probably the legend of Lemuria would have been long since forgotten, but for the unexpected support which it has received from more recent theories as to the geographical distribution of animals. It is found that certain unusual forms of animal life are peculiar to the islands which surround or lie within this area, and the former existence of a continent which would connect Madagascar with Western India, and whose eastern shores extended so far as the deeper seas between Malaya and Ceylon, might account for their occurrence. Beyond "Lemuria" and Diego Garcia, of which we have spoken before, is a deep channel, which, continued in a north-easterly direction, passes east of Java and Borneo, and to the south of the Philippines, dividing these from the Australian region in which are the islands of Celebes, of the Moluccas, of Floris, Timor, and New Guinea. This channel of unknown depth, though in places, as between Lombok and Bali, only a few miles wide, narrower in fact than the Straits of Dover, sharply separates the Australian region from that of India. Although these groups of islands, north and north-west of the continent of Australia, are known by the general name of the Malayan Archipelago, the vegetable and animal life of the areas thus divided are singularly unlike. The contrast is as great as between the flora and fauna of the Old World and the New. On the one side, the indigenous life of Borneo, within whose area the whole of the British Islands might be set down, with hundreds of square miles to spare, is strictly Indian, while on the other, in the still larger island of New Guinea, there is no native cat or tiger, no sheep, or deer, or oxen, or any form of quadruped with which we are familiar, but instead are genera which belong to the adjoining continent of Australia. Of seventeen mammals yet discovered, fourteen are marsupial; about one half of the land birds of New Guinea are Australian; the common trees of Timor are various species of Eucalypti; and if these and other genera and species, animal and vegetable, are compared, although the physical conditions are so different—New Guinea with its luxuriant forests and moist, hot climate, and Australia with its stony plains and dried-up water courses—the similarity in their natural productions is the more surprising, and may be deemed suggestive of some earlier period, we know not how remote, when one vast continent extended from Tasmania to the equator, comprising within its area not only what is now known as Australia, but the thousand islands beneath the tropics and the more important island of New Guinea. (For Australian Zoology, see chap. xiii.)

The ceaseless rapidity of movement which characterises an ocean steamer is certainly not favourable to the pursuits of the naturalist; a long voyage has been

well compared to a series of dissolving views, in which each recently formed picture is in its turn displaced by some perhaps strangely contrasting one, while from the continual change no picture of the series affords opportunity for examination in detail, nor does the memory long retain its distinct recollection. Far different was it in the old sailing days when light tropical airs, or calms of many days' duration, though wearisome to the crew who murmured as their vessel lay becalmed—

"As idle as a painted ship
Upon a painted ocean,"

yet afforded the eager naturalist, armed with dredge and muslin-net and microscope, opportunities which were all too few to examine and record the numerous and fascinating forms of life which abound in the upper waters of the sea. Still even now a voyage, however rapidly performed, presents numberless openings for intelligent observation, and it is for those who can watch with interest the appearance and movements of bird, or fish, or other living thing, or whose attention is attracted by the occurrence of unexpected colour in the sea, or of mysterious "Phosphorescent Light," that these short and necessarily imperfect notes are written; and if each intelligent observer would himself carefully and accurately record, with date and locality, everything of every kind which arouses his interest, he might not only stumble upon facts hitherto unproved, if not undiscovered, but would in after days at home, when his journeyings are over, find a deeper interest in the study of natural history than he had ever known before.

To tell of all the living things that may be seen in a voyage which extends half round the globe would be impossible; to describe and name every fish that may appear above the surface, and every bird that crosses the steamer's path, or that follows in its wake, would require a volume; the utmost we can attempt will be to record some few of the living creatures which will probably be seen, and in doing this we shall use fewest scientific terms, noting only such peculiarities of form or colour as will serve to distinguish one species from another, arranging the whole with some regard to their natural order from the lowest to the highest.

And first of the phenomena known as "*colour-bands.*"

Not unfrequently, especially in calm and sunny weather, and in warmer seas, broad bands or patches of colour will be observed extending over wide areas to be measured by miles. The prevailing tones are generally a dull red, or yellowish brown, or of some tint resembling the vegetable scum sometimes seen upon the surface of quiet pools or ditches at home. These colour-bands have been described by travellers, from the time of Captain Cook, under the names of "Whales' food," "Sea dust," "Sea Saw-dust," etc., but they attracted attention at a much earlier

period, and it has been suggested with more or less probability, that it was to the frequent occurrence of these "colour-bands" of a blood-red hue that a name was given to the Red Sea, equally significant in every language, modern Arabic and English, Latin and Ancient Greek. Ehrenberg was, we believe, the first to investigate the nature of these "colour-bands." He found them to consist mainly of a vegetable substance composed of minute thread-like forms of Algæ, to which he gave the name *Trichodesmium;* the individual plants are almost microscopic, it is only when collected in vast masses that their presence becomes apparent. Further researches have proved that occasionally other groups of "Protophytes" prevail in the formation of these colour-bands, of which the most remarkable are the fragile forms of Diatomaceæ, though these are less frequent in the Red than in more open seas. Diatomaceæ are vegetables of microscopic dimensions and simplest character, yet with firm and beautifully marked external silicious coating, and with apparently independent powers of motion; their prevailing colour is a yellowish brown, and where found they exist in such abundance that, as in the Antarctic circle, they are observed to impart a stain to ice and snow fields many miles in extent, while a deposit of brownish mud in Victoria Land, as reported by Dr. (now Sir J.) Hooker, 400 miles in length, and varying to 120 miles in breadth, was mainly composed of the frustules of Diatomaceæ. In a fossil state these remains are well known as "Bermuda Earth," "Infusorial Earth," and "Berg-mehl."

With few exceptions sea-weeds are attached to rock or shore in comparatively shallow waters, rarely flourishing, says Forbes, at a greater depth than 100 fathoms; but the well-known *Sargassum*, or gulf-weed, exists in large masses in the open sea far from land, chiefly in tropical or semi-tropical climates, and may frequently be met with in the long voyage to Australia. Kutzing, in his valuable work upon Sea-weeds, has pictured more than seventy species, three of which are peculiar to the Mediterranean, three to the Red Sea, while six or seven others belong to the Indian Ocean. *S. bacciferum*, the common Atlantic species, has long and serrate fronds, others are linear or strap-shaped, others finely divided, but all bear small globular balls or air-sacs, which cause them to float on or near the surface of the water, where they form the habitat of numberless glass eels, crabs, or other forms of crustacea, medusæ, etc. If a portion of this weed can be secured and examined at leisure, a surprising number of living organisms will often be discovered, although from their transparency and minute size some of the more delicate will easily be overlooked.

It might naturally be supposed that some connection exists between the "colour-bands" above described, and the singular "*phosphorescent light*," as it is

commonly but incorrectly termed, which so frequently appears after nightfall. Mr. Collingwood, to whose interesting *Rambles of a Naturalist in the China Seas* we shall again have occasion to refer, has an admirable chapter upon the "Luminosity of the Sea," in which he classifies the diversified forms which this luminosity assumes. The most frequent are the sparks or points of light which appear and disappear in disturbed water, not alone in the open sea, but even high up in tidal rivers; the rarest is what he terms *the milky sea*, a phenomenon we ourselves had once the good fortune to witness, when, on a perfectly calm and sultry night, the whole sea in every direction, except in the steamer's wake, presented a soft white appearance, "reflecting a faint light upwards, illuminating the ship and rendering every part of the rigging plainly visible," the white light contrasting strangely with the blackness of the densely clouded sky. So far as is at present known, the luminosity, in whatever form it appears, is not effected by vegetable, but by various animal organisms; for when carefully examined the light flashes are found to emanate chiefly from minute entomostraca, or from noctilucæ and Beroë, and from other forms of creatures low in the scale of life. The actual nature of the light has hitherto baffled investigation, but whatever it may be, the term "phosphorescence" is a misnomer. Whether it is the result of organic nervous force, which in other classes or orders of living beings is exhibited in the form of electricity, cannot be definitely asserted; but we are convinced that it is in this direction that the investigation should be pursued. Singular indeed will it be if the happy inspiration of a poet, clothed in fitting language nearly a hundred years ago, should have pointed to a solution which still eludes the keenest research:—

"... the waves
... spangled with phosphoric fire,
As though the lightnings there had spent their shafts,
And left the fragments glittering in the field."

The exact limits of the class to which the name of Medusæ is applied are not easy to define; closely allied to the *hydroid zoophytes*, they vary considerably in form, but retain certain qualities common to them all, which allow us to retain them in one group, the more readily since it is not improbable that they all, under special conditions, exhibit luminous powers. The Beroë, *Cydippe pileus*, is an egg-shaped transparent mass, seldom exceeding half-an-inch in diameter, though a variety measuring nearly two inches in diameter has been taken upon our own coasts. The Beroë moves by means of "cilia," and by branched tendril-like filaments, and is distinctly luminous; the points of light not being evenly distributed over the surface of the animal, but localized along eight

bright bands, which, like meridian-lines unite at their extremities and are equidistant along its circumference; these bands in the sunlight are highly iridescent, and have a constant vibrating motion. Another globular jelly-like animal is the *Noctiluca miliaris;* its normal size is about that of a small pin's head, flattened below; like the last, it occurs in incredible numbers, each individual being gifted with luminous powers, though the points of light are not as in the Beroë confined to distinct lines, but are dispersed irregularly through the body of the animal. To these two creatures we may probably assign a large proportion of the luminosity of the sea. The best known forms of *Medusæ* are the "jelly fish," so commonly left by the retreating tide upon our English coasts; where lying helpless on the sand, they rather resemble amorphous masses of jelly melting in the sun than active living creatures. Restored to their native element they are no longer shapeless, but conical or globular above, and concave below, with long and often brightly-coloured tentacles; they may not unfrequently be seen from the deck of a passing vessel swimming with a graceful movement by the alternate contraction and expansion of their transparent disc. They may not however be handled with impunity since they possess a stinging or irritating quality, the nature of which is unknown, and hence from earliest days they acquired the name, first applied to them by Aristotle, of "Sea Nettles," ἀκαλήφη. The most formidable member of the family is the *Cyanæa capillata*, an European species often more than twelve inches in diameter with long ribbon-like arms, which at times envelop an unfortunate bather, and remaining attached will continue to sting fiercely, even though severed from the parent trunk. It is possible that to some species of Acaleph may be attributed another form of luminosity which is not uncommon, especially in warmer latitudes. Looking over the side of the vessel on a moonless night, either into the wake or where the water is disturbed by the ship's movement, globular patches of light, from a few inches to a foot or more in diameter, will frequently be observed; the light is not steady or continuous, but appears and disappears at a few seconds' interval, while the shape, so far as it can be discerned, will be seen to resemble the familiar umbrella-like disc of these Acalephs. Other marine creatures, higher in the scale of life, undoubtedly possess these mysterious effulgent powers, exhibiting them, perhaps, only occasionally under peculiar atmospheric or other conditions, or when subject to some external irritation.

An Acaleph, which is not known to emit light, but is otherwise of singular interest, is the "Portuguese Man-of-War," *A. pelagica*. Though a denizen of tropical seas, where it sometimes occurs in prodigious numbers, it is occasionally

borne by winds or ocean currents into the western basin of the Mediterranean, to the coasts of Portugal and Spain, and as far northward as the Isle of Wight. The animal is of a bladder-like form, six to eight inches in length, furnished with tentacles capable of extension from a few inches to several feet, and possessing in an unusual degree the stinging properties of its species. But the creature is remarkable chiefly for the beautiful iridescent tints of blue, orange, etc., which it displays as it floats on the surface of the sea with no self power of guidance, but at the mercy of the wind and tide. Another floating Acaleph, the "Velella," found chiefly in the Mediterranean, is able to erect a semi-circular membranous crest, which acts as a veritable sail to propel it along the surface. What appears like a transparent undulating ribbon several feet in length, may sometimes be observed from the passing ship, a little below the surface of the water; this is the "Venus Girdle," *Cæstum Veneris*, an animal distantly allied to the Velella; while, much higher in the scale of life, are various species of *Salpæ*, a genus of tunicated molluscs, frequently observed in tropical seas, of somewhat elongated shape, perfectly transparent, except for some slight yellowish or reddish internal colouring, and varying from one to twelve or more inches in length. In one well known form the animals are solitary; in another they are linked together by their sides into a sort of chain, and, highly luminous at night, are often seen floating at a little distance below the surface swaying with the undulating motion of the water.

With the exception of the *Salpæ*, already mentioned, and of such species as may be found entangled in floating sea-weed, the only members of the extensive division known as Molluscs which are likely to be observed belong to a higher class, the *Cephalopoha*, "Squids" and "Cuttlefish"; these are sometimes found floating in considerable numbers, but not generally so conspicuously as to merit remark, were it not for the pretty fable of the Nautilus, *Argonauta argo*, entertained since the days of Aristotle, that the inhabitant of this lovely chambered cell spread its sails to the breeze, and employed its six long tentacles as oars to propel itself along the surface. It is true that the Nautilus does float upon the sea, but its "sails" are closely folded over the shell, which they entirely conceal; while its mode of progression, when not crawling along the bottom like a snail, is effected by drawing water into its body, and then forcibly ejecting it, thus producing a retrograde motion. It is not improbable that it was the Velella, above described, which was seen to erect its sail, but in the net which captured it the Argonaut was found; similar atmospheric or other condition had brought both to the surface; but once out of the water, the Velella would be only a pulpy, shapeless mass, and it

would be natural to suppose that it was the beautiful shell of the Nautilus that had been impelled by the delicately tinted sail.

The deck of an ocean steamer, driving along at a rate of from fifteen to twenty miles an hour, would not generally be selected as a convenient vantage ground for observing the forms and habits of deep-sea fishes; it might rather be supposed that the commotion created by a swiftly passing vessel would cause the timid denizens of the sea to seek refuge in its profounder depths from unknown dangers. With most species this, doubtless, would be the case, yet there are fishes which, rarely approaching the shore, are attracted by a moving vessel, and for days together will follow in its track; others again, swimming in shoals near the surface, will only be seen as they retreat, often throwing themselves out of the water in their efforts to escape. Among the latter are the well-known Flying-fish, *Exocœtus*, belonging to the third sub-order of osseous or bony fishes. In shape they resemble the Herring, except that in the Flying-fish the lower lobe of the tail is longer than the upper; they vary from twelve to sixteen inches in length, and, though straying occasionally into English seas, are only common in warmer latitudes; *E. evolans* prevailing in the Atlantic and in the Indian Ocean; *E. volitans*, a slightly larger fish, being more frequent in the Mediterranean; *volitans* may be distinguished by the possession of elongated ventral fins, which are not, as in *evolans*, placed near the head, but are so far back that if folded they would almost conceal the anal fin and touch the base of the tail. A third species is described, *Dactyloptera mediterranea* (*Dallas*), allied to the Sticklebacks; it may be known by the spines of the fins projecting, as do those of the Gurnard, beyond the webs.

Flying-fish do not possess true wings, neither, in the strict sense of the word, can they be said to fly. It would be a more correct description to say that their pectoral fins are so greatly enlarged that when, after a rapid passage beneath the surface, they project themselves into the air, the extension of these fins enables them to glide along for a considerable distance before they fall back into the sea. Mr. Collingwood, whose careful observations are recorded in his *Rambles*, tells us that a rapid vibration of the "wings," apparent just as the fish leaves the water, recurs each time it touches the crest of a wave, when it acquires a fresh impetus, not unfrequently altering the direction of its flight. He considers that the cause of their flight must undoubtedly be attributed to fear; he describes their rise from the ship's cutwater or bow as in a direction away from it in straight but radiating lines, adding that when a shoal is suddenly attacked by some predaceous fish they will rise and fly in all directions; he does not believe that they ever leave the water in play or sportive humour, but solely to escape from some peril, real or imaginary.

Chief among the enemies of the Flying-fish, and occasionally seen as they spring out of the water in their pursuit, are some of the larger species of *Scombridæ*, an extensive class, varying in size, but of which the common Mackerel may be taken as the type. The best known is the Thunny, "the fish of many names," *Scomber thynnus*. Although at times occurring in British waters it is chiefly found in the Mediterranean, where it swims in shoals, and though in length it does not ordinarily exceed four or four-and-a-half feet, fish of eight, ten, and even of fifteen feet length have been recorded; one indeed is mentioned by Aldrovandus, in his volume *De Piscibus* (lib. iii. p. 317), as taken off the coast of Spain, which measured no less than thirty-two feet in length, with a girth at its broadest part of sixteen feet; on which his commentator in all seriousness remarks "it must have been very like a whale." It may be added that with the careful accuracy which befits a distinguished naturalist he records the date of its capture, "*die* 12 *Maij*, 1565," and gives a full page illustration of a deep-bellied creature with a beak like a parrot, and on its sides rudely drawn pictures of ships! "*in cuius corio trieremes exsculptæ sunt.*" Other varieties of Thunny are the Bonito, *Scomber bonito*, thirty inches in length, well known off the coasts of Spain, in the Mediterranean and in tropical seas, as the unrelenting foe of unfortunate flying-fish; and the *Thynnus alalonga*, whose trivial name, Albicore, is not unfrequently applied to other species of Thunny. Allied to these is the Pilot-fish, *Naucratis ductor*, so called from its habit of accompanying ships, no doubt to feed upon whatever offal may be thrown overboard. In olden time when the compass was unknown, and a voyage from port to port was often one of danger and uncertainty, the Naucratis was credited with the amiable instinct of pointing out the route to the bewildered mariner; it is still believed to attend the shark, for the purpose of guiding it to its food and warning it of coming peril, but a more probable explanation of the strange companionship is that it may share the spoil which falls to the rapacious jaws of its savage friend.

In another order are the Squali or Sharks; the Blue Shark, *Carcharias glaucus*, a migratory fish, seven to eight feet in length, is an inhabitant of the Mediterranean, as are the White Shark, *C. vulgaris*, twenty-five to thirty feet, and the Hammer-headed Shark, *Zygæna malleus*, about twelve feet in length, both these are found in tropical as well as temperate seas. Closely allied to them are the Rays, species of which it is said attain a diameter of twenty feet, and may be occasionally met with basking near the surface of the water.

The Loggerhead Turtle, *Chelonia caretta*, four to five feet in length, inhabits all tropical seas, and may be met with in the Mediterranean; the Leathery Turtle, *Sphargis coriacea*, which sometimes attains a larger size, eight feet, has the

surface of the shell covered with a leathery skin instead of the usual horny plates. It was the desiccated seven-ridged shell of this species which according to the old Greek legend was discovered on the shore by Hermes, who, stretching the dried tendons across it, invented the lyre, and by its melody assuaged the anger of Apollo.

For greater convenience we here depart from the natural arrangement, and instead of the birds, which, from certain singular affinities, should follow the reptiles, we notice the few Cetacea which may possibly present themselves. In early books on natural history whales were regarded as fish; they are mammals belonging to the sub-class *Placentaria*, and though strictly aquatic in their habits, they are true mammals; they breathe by means of lungs, not gills, they have warm blood, and, like the thick-skinned land animals to which they are related, they suckle their young. The Cetacea are divided into three easily recognised groups; in the first are the "Whalebone-whales," of which *Balæna australis*, an inhabitant of the great Southern Ocean, is an example, it may be known by the absence of a dorsal fin; and *B. musculus*, which has a dorsal fin, and which inhabits the Mediterranean, occasionally attaining a length of eighty feet. In the second group are the Whales which carry no whalebone, but have conical teeth in the lower jaw; they are represented by the "Sperm Whale," *Physeter macrocephalus*, which has a huge truncated head fully one-third of the entire length of the animal, and is most frequently seen in the Southern Ocean. The third group comprises the *Delphinidæ* or "Dolphins," in which the head, instead of being one-third or one-fourth, is about one-seventh of the total length, the body is, therefore, more fish-like, and as these animals inhabit the open sea often far from land, it is no wonder that they should long have been regarded as true fishes. The commonest species, the "Porpoise," *Phocæna communis*, is found in every sea and frequently ascends the mouths of rivers in search of food; it is from four to eight feet in length, has a dark back, white belly, and pointed snout. The "Grampus," *P. orca*, a nearly allied species, attains a length of eighteen feet. The "Round-headed Porpoise," *P. melas*, may be distinguished by its round-ended head, it attains a length of about twenty feet. The true "Dolphin," *Delphinus delphis*, six to eight feet in length, has a somewhat prominent forehead which causes the prolongation of the jaw to resemble a snout. Closely allied is the "Narwhal" or Sea Unicorn, *Monodon monoceros*, fifteen feet in length. The Dolphins are all active in their habits, and may frequently be seen gambolling in a playful manner about a passing ship or chasing the unfortunate Flying-fish, often throwing themselves out of the water in their pursuit. The "Dugong," *Halicore cetacea*, which has the upper jaw curiously bent downwards

in front of the lower jaw, is herbivorous, and is found in the Red Sea and on the shores of the Indian Ocean.

Among the numerous birds which will be observed during the long voyage to and from Australia, it is not improbable that some species of land birds on migration, or driven to sea by stress of weather, will approach or even seek temporary refuge on a passing ship; but this occurrence must be regarded as accidental, and it would unduly extend our notes if we attempted to describe the swallows, finches, etc., which may or may not appear. We only include in our list such land birds as may possibly be seen when passing through the Suez Canal and the gulf of Arabia; all others we describe are *ocean birds*, *i.e.*, birds which make their homes upon the sea, rarely visiting the land except during the breeding season; and *coast birds*, which though often wandering many miles in search of food, yet return at nightfall to their resting places upon the shore.

Our list does not profess to be an exhaustive one, nor are our descriptions of the different species such as would satisfy a scientific ornithologist; we have only attempted to point out such peculiarities in form or size or colour, as are most noticeable and will best assist in identification; avoiding, as far as possible, the use of scientific terms, but giving for future reference the special as well as the common or trivial names. So far as is practicable we have adopted the arrangement and nomenclature of Seebohm's *British Birds*. This and the last edition of Yarrell's *British Birds*, Gould's *Birds of Australia*, Sharpe and Dresser's *Birds of Europe*, and Shelley's *Birds of Egypt*, have all been consulted, as well as some important papers by Mr. Howard Saunders, in the *Ibis*, and Proc. Zool. Socy., and the authorized Reports of the *Challenger* Expedition, etc., etc.; and we may add that many of the descriptions have been corrected by the examination of specimens preserved in our great National Collection, and in some cases with living or more recent examples. The writer would be the last to assume that no errors have crept in, but he believes that his notes may be generally accepted as correct.

Order Accipitres. Family Falconidæ.

Griffin Vulture. *Vultur fulvus.* Head and neck covered with white down; dullish white ruff round lower part of neck; general plumage yellowish-brown; broad wings, short tail; seen in flocks; Egypt. (42—48 in.)

Egyptian Vulture. *V. percnopterus.* Head and throat bare, yellowish flesh colour; general plumage white, with black edge to wings, which when they are open shows like a dark band; general plumage of immature bird is dark brown; Egypt; seldom seen in flocks, mostly in pairs. (26—29 in.)

Osprey. *Pandion haliaetus.* Crest and nape white, streaked with brown; general plumage upper, dark brown; under, white, with light brown band across the breast; long wings and tail; English Channel, rare; winters in North Africa, Egypt, and Nubia, and on islands in the Indian Ocean. When in flight the legs are extended in a straight line behind; the greater proportionate length and the curvature of the wings will distinguish it from other hawks. (22 in.)

Egyptian Kite. *Milvus ægyptiacus.* General plumage brown; head and neck grey; the forked tail is crossed by nine or ten bars; beak and legs yellow; Egypt, common. (24 in.)

White-tailed Eagle. *Haliaetus albicilla.* General plumage brown or ashy-brown; tail white and rounded at the end; female rather larger; Egypt, Lake Menzaleh. (18 in.)

Sparrow-hawk. *Accipiter nisus.* General plumage slaty or rufous-brown, with darker bars; Egypt, common. (12—15 in.)

Order Passeres. Family Corvidæ.

Raven. *Corvus umbrinus.* "Noah's Raven." General plumage black; head and neck very dark brown; Egypt and Nubia. (22—23 in.)

Hooded Crow. *Corvus cornix.* Head, wings, and tail black; rest of plumage grey; estuary of Thames and Egypt; common. (18—20 in.)

Rook. *Corvus frugilegus.* Wholly black; England and Egypt. (18—21 in.)

Jackdaw. *C. monedula.* May be distinguished from last by grey, sometimes almost white collar, and more rapid action of the wings; English Channel, Mediterranean, not recorded in Egypt. (14 in.)

Family Sturnidæ.

Starling. *Sturnus vulgaris.* General plumage dark; winter visitant in Egypt to end of March; seen in flocks. (8—9 in.)

Family Hirundinidæ.

Common Swallow. *Hirundo rustica.* General plumage steel-blue and brown above, under parts white; a winter visitant in Egypt, or seen on migration. (8 in.)

Egyptian Swallow. *H. riocourii.* Differs from last in having under surface chestnut brown; resident and common in Egypt. (7 in.)

Sand Martin. *H. riparia.* Upper parts mouse-colour and brown; under parts white; Egypt; winter visitant to end of March. (5 in.)

Order Picariæ. Family Cypselidæ.

Swift. *Cypselus pallidus.* General plumage greyish-brown, is lighter in colour and smaller than Common Swift; Egypt and Nubia. (6½ in.)

Order Columbæ. Family Columbidæ.

Rock-dove. *Columba livia.* General plumage slate-colour, lower back and rump white; in flight a black bar crosses the wings; Egypt and Nubia, common. (14 in.)

Turtle-dove. *Turtur auritus.* General plumage ash-colour, inclining to brown; shoulders and wing coverts black; at sides of neck are rows of black feathers with white margins; under parts white; Egypt, in the spring. (11½ in.)

Sharpe's Turtle-dove. *T. sharpii.* (Described by Shelley. ? the *T. isabellinus* of Seebohm.) Like the last, but no blue shading on head or back; Egypt, earlier in year than *auritus*. (11—11½ in.)

Order Herodiones. Family Ardeidæ.

Heron. *Ardea cinerea.* Head white; long bluish-black plumes from the crest; neck white with dark grey markings; long white and grey feathers hide the breast; a black border to outer wings; Egypt. (60 in.)

Great White Egret. *A. alba.* Plumage white; short plumes from crest; Lake Menzaleh, Egypt; in flocks. (40 in.)

Little Egret. *A. garzetta.* Plumage white; crest of two long white feathers; Egypt; singly or in pairs. (23—25 in.)

Buffed-back Heron. *A. bubulcus.* Plumage white; buff tints on head, only in summer; no long crest feathers; rufous-buff feathers hang from neck in front; Egypt; in flocks. (20 in.)

Spoonbill. *Platalea leucorodia.* General plumage white; long black bill, yellow and spoon-shaped at end; Egypt; in flocks on the marshes. (32 in.)

Glossy Ibis. *Ibis falcinellus.* Upper plumage dark green, under surface a reddish-brown, bill long and narrow and curved downwards; supposed to be the "Black Ibis" of early writers; Egypt, etc. (24 in.)

Sacred Ibis. *I. religiosa.* General plumage white; head and neck black (without feathers); feet black; Egypt.

White Stork. *Ciconia alba.* General plumage white; lower half of wings black; bill and legs red; no long crest feathers; a stouter bird than the heron; Egypt; in large flocks. (42—44 in.)

Black Stork. *C. nigra.* General plumage black; under parts white; Egypt; singly or in pairs. (40—42 in.)

Order Alectorides. Family Gruidæ.

Crane. *Grus cinerea.* General plumage slaty-grey; pendant plumes cover the tail and are darker at the ends; Egypt; October to March. (48 in.)

Order Limicolæ. Family Charadriidæ.

This family includes a large number of what are known as marsh and wading birds—the Plovers, Avocets, Oyster-catchers, Curlews, Snipes, etc.—but it is hardly possible, without illustrations, so to describe the several species which may be seen in passing the Suez Canal, or along the Red Sea, that the bird or flock of birds may at once be named. They have mostly long-pointed wings, unwebbed or partially webbed feet, with a minute elevated hind toe; there are about two hundred species.

Oyster-catcher, or "Sea-pie." *Hæmatopus ostralegus.* Black above; white below; with a white bar on the wing; and deep orange bill; may be met with anywhere from the English Channel to the Red Sea. (14—16 in.)

Sooty Oyster-catcher. *H. fuliginosa.* Bright orange bill; whole plumage sooty black; legs and feet brick red; South Australian seas. (15 in.)

Ringed Plover. *Charadrius hiaticula.* Dark grey plumaged above, white below, with black band across the breast; when in flight a continuous white bar is seen across the wings. A winter visitor in North Africa. (7½—8 in.)

Golden Plover. *C. pluvialis.* Summer plumage black, upper parts spotted with gold; in winter the under parts are white; breast and sides mottled with greyish-brown. Same. (9½ in.)

Grey Plover. *C. helveticus.* Summer plumage black, upper parts spotted grey and white; winter plumage, under parts ashy-brown and white. Same. (12 in.)

Lapwing or Peewit. *Vanellus cristatus.* General plumage, dark green or black above, under parts white; has crested feathers at the back of the head, slightly turned upwards. Winter visitor to North Africa. (12—13 in.)

Nile Plover. *Cursorius ægyptius.* Long legs; short, pointed bill; and black mantle; may be easily distinguished. (13 in.)

Avocet. *Recurvirostra avocetta.* Has webbed feet; black patches on the head, back, and wings; white under surfaces; and the long bill curved upwards. Breeds in Palestine and Persia. (17—18 in.)

Stilt. *Himantopus melanopterus.* Bill black; back and wings nearly black, tinged with green; head, neck, and under parts white, with rosy tinge; legs (long) and toes pink. (13 in.)

Curlew. *Numenius arquatus.* General plumage, brown, with paler markings, darker on the back; legs and toes pale blue; the long dark brown bill curves downwards. Egypt in winter. (20—21 in.)

Whimbrel. *N. phæopus.* General plumage closely resembles the Curlew, is less common, and of smaller size. In winter as far as Aden. (15—17 in.)

Sandpiper, "Summer-snipe." *Totanus hypoleucus.* Upper plumage greenish-brown; under parts white; legs and toes green. (7½ in.)

Red-shank. *T. calidris.* Upper plumage ashy brown, under parts white; if immature with light brown markings; legs and feet orange red. (10—11 in.)

Order Gaviæ. Family Laridæ.

The Terns may be distinguished from the Gulls and Skuas (with one exception, Sabine's Gull, not likely to be met with on the Orient route) by their long and more or less forked tails: hence their name, "Sea-swallows." They have long, slender bills, the curvature of the upper mandible scarcely varying from base to tip; long wings, short legs, and small webbed feet; they swim with ease, and have a very graceful flight. The genus contains about fifty species.

Black Tern. *Sterna nigra.* General plumage dark slaty-grey, darkest on head; under tail surface white; England and Egypt. (10 in.)

White-winged Black Tern. *S. leucoptera.* Dark body; white shoulder, upper tail coverts and tail; Delta of Nile and Red Sea. (9½ in.)

Gull-billed Tern. *S. anglica.* General plumage ashen-grey; bill, forehead, crest and nape black; legs and feet reddish-black; English coasts to Mediterranean and Red Sea. (About 15 in.) An allied bird, *S. macrotarsa*, frequents the shores of Australia.

Caspian Tern. *S. caspia.* Bill scarlet, yellow at sides; general plumage as the last, but neck, breast, under parts and tail white; claws strong and curved; a larger and heavier bird than *S. anglica;* a coast bird from England to Australia; probably identical with the *S. strenuus* of Gould. (18—20 in.)

Sandwich Tern. *S. cantiaca.* General plumage, upper parts pearl-grey, under parts white; bill black, with yellow tip; forehead, crest and nape, legs and feet, black; ranges far from land; may be met with anywhere. (15 in.)

Roseate Tern. *S. dougalli.* General plumage as the last, but has a delicate rose-colour tinge on whole under surface, and is of a slighter and more elegant form; short wings; long tail, the fork varying from 3½ to 6 inches; Atlantic, Indian Ocean, rare. (? the *S. gracilis* of Gould.) (15—17 in.)

Common Tern. *S. hirundo.* In general plumage resembles the Sandwich Tern, but the bill is orange red with a black tip, and legs and feet are red; fork of tail 1½ to 3 inches; Atlantic, Mediterranean, possibly Egypt. (14—14½ in.) It is represented in the Red Sea as far south as Ceylon, by *S. Albigera*, a rather slighter bird, with smoky plumage, darker on rump and tail.

Little Tern. *S. minuta.* General plumage, upper parts pearl-grey; tail, rump, and under surfaces white; black head and nape; white forehead; is nowhere abundant. (8 in.) An allied species, *S. sinensis*, frequents the Red Sea. The Australian form is the *Sternula nereis* of Gould. Bass' Straits, etc. (10 in.)

Sooty Tern. *S. fuliginosa.* Upper plumage brownish or dull black; forehead, chin and whole under parts grey or white; bill, legs and feet black; may be met with anywhere on the voyage; is known to breed in, among other places, the Red Sea. (14—16 in.)

Noddy Tern. *S. stolida.* Uniformly black or dull brown; an inter-tropical species whose range extends almost round the world. (14 in.)

Black-naped Tern. *S. melanauchen.* Upper plumage pearl-grey, with gorget-shaped black mark on nape; bill, legs and feet black; south coast of Australia. (13 in.)

White Tern. *Gygis candida.* A small snow-white Tern with black bill; orange legs and feet; and large black eyes; south coast of Australia. (9 in.)

Scissor-bill Tern. *Rhynchops flavirostris.* Described by Shelley as occurring in Egypt; brown above, forehead and under surface white; orange-red feet and bill; the under mandible one-third longer than the upper. (17 in.)

Gulls, a genus containing about fifty species, may be distinguished from Terns and Skuas by their square-ended tails; the only exceptions are Sabine's Gull, *L. sabini*, which has a forked tail like a Tern, and Ross' Gull, *L. Rossii*, which has a distinct cuneate tail like that of a Skua, but neither bird is likely to cross the path of an Orient steamer. The bill of the Gull is intermediate between that of the Tern and that of the Skua, which latter is more hooked and has a square appearance, the line of the gape curving rapidly downwards beyond the nostril, whereas in the Gull it appears triangular; again, in Gulls and Terns the nasal aperture is longitudinal, in the Skuas it is diagonal.

Little Gull. *Larus minutus.* General plumage, upper surface pale ash-grey, under surface white; in summer head black, bill reddish-brown; in winter bill black, forehead and parts of neck white, crest streaked with black; small flocks, from English Channel to Mediterranean. (10—10½ in.)

Black-headed Gull or Laughing Gull. *L. ridibundus.* Summer plumage, head and upper neck dark brown; sides and back of neck white; mantle French-grey; tail and under surfaces white; black edge to wings; bill, legs, and feet red. In winter plumage, head white streaked with grey; common everywhere. (16 in.) The Mediterranean form, *L. melanocephalus*, has a darker head.

The Great Black-headed Gull. *L. ichthyætus.* General plumage grey or pearl-grey; bill orange-yellow, having a transverse black bar across it at about two-thirds its length from the head, beyond which the bill is tinged with red; head and upper part of neck black; a white mark behind the eye; one of the largest of the genus; England (rare), Mediterranean, Egypt, Red Sea, coasts of India. (27 in.)

The Common Gull. *L. canus.* General plumage white; mantle pearl-grey; bill, legs, and feet yellow; "The Blue Maa"; England to Mediterranean. Although known as the "Common" Gull, this bird is not so frequent as the Herring Gull and the Kittiwake. (18½ in.)

Lesser Black-backed Gull. *L. fuscus.* Mantle dark slaty-grey, rest of plumage white; points of wings black with white spots; bills, legs, and feet yellow. Less shy than the other large Gulls. England, Mediterranean (in winter), Red Sea as far as Aden. (23 in.)

Great Black-backed Gull. *L. marinus.* General plumage as last, but mantle is darker; ends of wings with white points; bill yellow; legs and feet flesh-coloured. An Atlantic bird; sometimes strays into Mediterranean; may be known by its loud, harsh croak, its long wings, and powerful flight. (30 in.)

Pacific Gull. *L. pacificus.* Is the southern form of *L. marinus*, which it resembles in general appearance, but the bill is orange deep-red at tip, and the tail is white, crossed with a broad band of black; coasts of Australia. (29—31 in.)

Herring Gull. *L. argentatus.* Head, neck, and under surface white; mantle French-grey; the long feathers of the wings black with white tips; bill yellow; legs and feet flesh-coloured; immature birds white, spotted brown; English Channel; frequents harbours; has a slow laborious flight. The Mediterranean form, *L. cachinnans*, has a ring round the eye of deep orange-red. (22—24 in.)

Jameson's Gull. *L. novæ hollandiæ.* "The Silver Gull," "The Little Gull" of the Colonists. General plumage as the last; points of wings tipped black; bill, legs, and feet blood-red; red mark round the eye; large flocks frequent the southern shores of Australia. (14 in.)

Kittiwake. *L. tridactylus.* General plumage white; mantle pale slaty-grey; bill greenish-yellow; legs dingy-grey; the commonest of British gulls; frequents the Mediterranean as far as Malta; received its familiar name from its peculiar cry, "Kitti—aa, Kitti—aa." (15 in.)

The Skuas are distinguished from the Gulls by their wedge-shaped tails; the upper mandible of the bill is straight for two-thirds its length, then ends in a strong curved raptorial hook; the nasal aperture is diagonal.

Great Skua. *S. catarrhactes.* General plumage dark brown with a white bar upon the wings; legs and feet black with crooked talons; roundish wings and a heavy flapping mode of flight; solitary habits; English Channel, Atlantic, South Indian Ocean, Tasmania. (24—25 in.)

Pomarine Skua. *S. pomarinus.* General plumage blackish or dark brown; under surface as far as legs white; the two central tail feathers extend four inches beyond the others and have a curious vertical twist; winter visitor as far south as Mediterranean. (21 in.)

Richardson's Skua. *S. Richardsoni.* Birds of this species are found on the same breeding ground with entirely different plumage; one form entirely sooty-grey; the other slate-grey with lighter or almost white under parts; its lesser size may distinguish it from the Great Skua; while the central pair of tail feathers, which are three inches longer than the next feathers on each side, are not twisted as are the corresponding feathers in *S. pomarinus.* (20 in.)

Order Pygopodes. Family Alcidæ.

A certain amount of confusion seems inevitable in bird nomenclature. The *Genus Puffinus* belongs to the *Family Procellariidæ* and is represented by the

Shearwaters, while the bird next described, of very dissimilar appearance, belonging to the *Genus Fratercula*, and the *Family Alcidæ* or Auks, is commonly known as "The Puffin."

Puffin. *Fratercula arctica.* "Sea Parrot." General plumage, upper surface black; face and under surface white; a black collar round the neck; bill of a curious parrot-like shape, bluish-grey crossed by orange bands; English Channel, common. (6—12 in.)

Razor-bill. *Alca torda.* Head and upper surfaces black, under parts white; has a narrow upper bill like the blade of a pruning knife, crossed towards the end with a curved white line; a white bar on the wings; legs and feet black; English Channel, Atlantic, Mediterranean as far as Malta. (17 in.)

Black Guillemot. *Uria grylle.* Summer plumage black, with large white patch on the wing; winter plumage barred with white; under parts white; has a pointed bill; red legs and feet; English Channel. (14 in.)

Common Guillemot. *U. troile.* General plumage as the Razor-bill, but very short tail, nearly straight; pointed bill without white markings; as above. (18 in.)

Family Colymbidæ.

Great Northern Diver. *Colymbus glacialis.* "The Loon." General plumage black spotted white, under parts white; head, neck, and bill black; two white bars round throat. English Channel, winter. (30—33 in.)

Black-throated Diver. *C. arcticus.* Smaller bird, with narrow half collar just below chin. English Channel. (25—26 in.)

Red-throated Diver. *C. septentrionalis.* Head, face, and neck ash-grey; upper surface black speckled white; under surface white; a red conical patch on the throat; from mouth of the Thames to Mediterranean, has been seen in Egypt. These birds have a singular power of sinking into the water before diving; it is performed by a rapid action of the feet, until little more than the head and neck are visible, when they bend the head forward and disappear. (23—24 in.)

Order Tubinares. Family Procellariidæ.

Gould, in speaking of this family, observes that "there is perhaps no group of birds respecting which so much confusion exists, and the extent of whose range over the ocean is so little known." He has described thirty-three species as peculiar to the southern hemisphere, at the head of which he places the Genus *Diomedea;* these are all oceanic birds, *i.e.*, they rarely visit the land except during the breeding season, and feed principally on *Medusæ*, *Physalia*, etc., or on the offal thrown overboard from passing ships. They possess extraordinary powers of flight; day after day will the same birds attend a vessel, sailing and wheeling about in every direction without ever alighting to rest; the larger species often soaring for an hour or more without any apparent motion of the wings. (The nomenclature of these birds and of all southern species is that of Gould, who however rarely gives the length of the bird.)

Wandering Albatross. *Diomedia exulans.* "The Goney." Mature birds white with black pinions; bill pale yellow, upper mandible hooked at the point, the nasal apertures on each side of the bill are protected by short tubes. Immature birds, freckled or dark brown, but with white face; legs and feet pinky-white; length 3—4 feet, across wings 10—11 feet. Examples have been recorded 13, and in one instance more than 17 feet, across the wings.

Short-tailed Albatross. *D. brachyura.* Not so large, but closely resembles *exulans;* has short, truncated tail. Immature birds are chocolate-brown. Is met with north of the equator. (2½—3 ft.)

Shy Albatross. *D. cauta.* Head, neck, throat, under surface, and upper tail-coverts white; mantle and tail greyish brown; yellow line along the top of the bill (the culmen) and at base of lower mandible. (30—31 in.)

Culminated Albatross. *D. culminata.* As the last, but darker mantle and tail; bill black, with yellowish horn-coloured culmen and tip; same along lower edge of under mandible; a grey-black mark around the eye. (30 in.)

Yellow-nosed Albatross. *D. chlorhorhynchus.* As the last, immature birds have darker plumage; tail slate colour, with white shafts; bill black, culmen bright orange-yellow, the yellow line extends back almost to the eye; bird about the size of a Goose; its only known breeding place is the island of Tristan da Cunha; both this bird and the next are the "Mollymauk" of the sailors. (Voyage of *The Challenger.*) (30—34 in.)

Black-browed Albatross. *D. melanophrys.* General plumage white; the dark mantle forms a distinctive mark, like a black band, across back and wings; before, above, and behind the eye is a streak of dark grey.

Sooty Albatross. *D. fuliginosa.* General plumage deep sooty-grey; a white mark round the eyes; bill black, with a line of white cartilage along the top; tail wedge-shaped; less heavily built than others of the species; its evolutions in flight are performed with greater ease, and it has a habit of poising itself directly above the ship.

The Petrels form a well defined group, comprising about a hundred species, varying in size from the Giant Petrel, with a spread of wing more than six feet across, to the Mother Carey's Chicken, six inches in length, the smallest web-footed bird known. They have, in proportion to their size, long wings, short tails, and bills hooked at the end; while the nasal tubes lie together on the upper part of the bill, instead of on each side, as in the Albatrosses.

Great Shearwater. *Puffinus major.* General plumage, upper parts dark brown, under parts white; a conspicuous patch of white above the tail; bill black; legs and feet dull red; flies with wings much bent close to the water; English Channel to Mediterranean. (14—18 in.) An allied species, *P. kuhli,* is found in the Mediterranean; it has both upper and under tail-coverts white.

Manx Shearwater. *P. anglorum.* Upper parts dark slaty-brown, under parts white; feet slaty-grey and white. (14 in.) "These birds," says Seebohm, "fly close to the surface of the water, in an almost perfectly straight line, one behind the other, and at an incredible speed; every muscle seems to be strained; they hurry along as if the furies were behind them, and hence have acquired among the Levantines the sobriquet of 'âmes damnées.'"

Australian Shearwater, or Allied Petrel. *P. assimilis.* Allied to *anglorum,* but is a smaller bird; South Australia and Bass' Straits. (11 in.)

Short-tailed Shearwater. *P. brevicaudus.* The "Short-tailed Petrel," "Sooty Petrel," or "Mutton-bird"; the whole plumage sooty-brown; bill black; legs black with yellow webs; South Australia. (11—13 in.)

Flesh-footed Shearwater. *P. carneipes.* Has light flesh-coloured bill and legs; South Australia. (11—13 in.)

The Fulmar Petrels are large birds; the wings long and pointed; the tail short and round; the bill short, the nasal tubes extending about half its length; ocean birds; their flight resembles that of the Gull. The only species likely to be met with by the Orient voyager is the

Fulmar Petrel. *Fulmarus glacialis.* Head, neck, breast and under surfaces white; rest of plumage pearl-grey; upper mandible horn-coloured with yellow end; lower mandible reddish; English Channel and Mediterranean. (19 in.)

Giant Petrel. *Procellaria gigantea.* Entire plumage dark chocolate brown; bill a conspicuous light horn colour with rufous tinge at the point; a large bird; its spread of wing, six feet to six feet six inches; this is the bird known as "the Cape Hen," "Nelly," "Mother Carey's Goose"; is sometimes mistaken for an Albatross, but its flight is more laboured and it is a shyer bird; south latitudes.

Spectacled Petrel. *P. conspicillata.* Entire plumage sooty-black, except chin, sides of face, and a white band nearly surrounding the eye and crowning the forehead, looking like a pair of large white spectacles; bill and nasal tubes light horn colour; black legs and feet; south latitudes.

Great Grey Petrel. *P. hæsitata.* General plumage brownish-grey; under surfaces white; bill whitish horn; feet bluish-white; in action and flight this bird resembles the Albatross; like all Petrels, it flies with its long legs stretched out behind, giving a forked appearance to the tail.

White-headed Petrel. *P. lessonii.* Forehead, face, all under surfaces, and tail white; mantle brown, darker on the wings; bill black; legs and feet flesh-white; webs black; a black mark round and before the eye; when on the wing the white face contrasts with the dark W-shaped wings; Bass' Straits.

White-winged Petrel. *P. cookii.* Crown of head and all upper surfaces dark slaty-black; all under surfaces, together with under surface of the wings, white; bill black; legs and feet fleshy-white; Bass' Straits. (13 in.)

Of the smaller birds familiarly known as Petrels, and which vary from six to ten inches in length, ten species are known, three of which are British; they are most numerous in the southern seas. Buffon suggested that their habit of paddling on the water, as if walking, obtained for them the name of Petrel, after the Apostle St. Peter, the derivation being *Pierre, pierrot, ou petit pierre.*

Storm Petrel. *P. pelagica.* "Mother Carey's Chicken." General plumage black; under parts rather lighter; outer edge of wing, upper tail coverts, and sides of vent white; is the smallest web-footed bird known; Atlantic and British seas. (6 in.)

Grey-backed Storm Petrel. *P. nereis.* General plumage sooty-black; has no white mark on the rump, but is grey along middle of wings and upper part of tail; belly and under wings white; Bass' Straits. (6½ in.)

Fork-tailed Petrel. *P. leachii.* General plumage sooty-black with white above the tail, which has a long fork; Atlantic, strays into Mediterranean. (7½ in.)

Wilson's Petrel. *P. wilsoni.* Similar general colouring, but has a square tail with a curved line of white across its upper part; white round the vent; feet black, with oblong yellow patch on each web; Australian and Indian Seas as far north as the Equator. (7½ in.) The Yellow-webbed Petrel, *Thalassidroma oceanica*, described by Gould as frequenting southern seas, is probably a variety of *wilsoni.*

Black-bellied Petrel. *Thalassidroma melanogaster.* General plumage deep sooty-black; the occurrence of white on the flanks gives the effect of a broad dark band down the centre of the belly; South Indian Ocean. (7½ in.)

White-bellied Petrel. *T. leucogaster.* Resembles last, but the dark band is wanting. The action of both these birds is described as that of "fluttering like a butterfly." South Indian Ocean. (8 in.)

Blue Petrel. *P. cærulea.* Ash-grey above; white below; may be known by the conspicuous white tips of central tail feathers; South Australia.

Cape Petrel. *Daption capensis.* "Cape Pigeon." Wing coverts, back, upper tail coverts and under surface of wing white; rest sooty-brown; bill and feet blackish-brown; common in south latitudes.

The Prions, oceanic birds, only resorting to the land during the breeding season, are distinguished by their broad bills and delicate grey colouring. Their plumage is thick and downy, making the birds look larger than they really are. They are a strictly southern form, associating generally in large flocks. Only four species are known, all of which may be met with in the South Indian Ocean or in Australian seas.

Dove-like Prion. *Prion turtur.* Upper surface delicate blue-grey; under surface white; edge of shoulder, outer margins of wings and tips of tail feathers black; when the wings are expanded these marks form the letter W; bill light blue, black at sides and tip; legs and feet light blue. (10—12 in.)

Fairy Prion. *P. ariel.* Like the last, but smaller; has no grey mark before the eye. (9 in.)

Bank's Prion. *P. banksii.* Resembles *turtur*, but has a larger and darker-coloured head. (10—12 in.)

Broad-billed Prion. *P. vittatus.* Edge of shoulder, outer margins of wings, and end of tail slaty-grey; bill broad at the base. (12—13 in.)

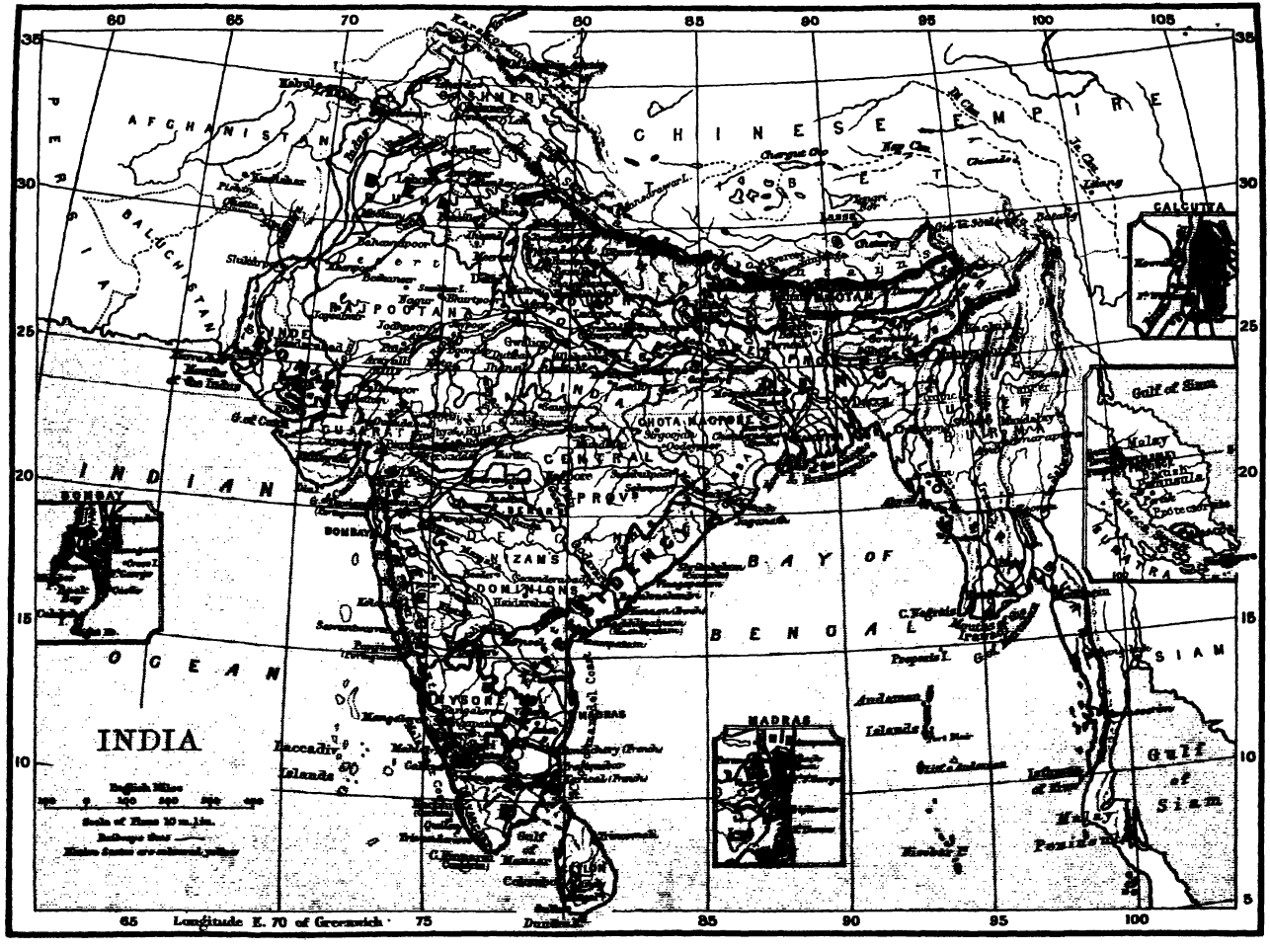
Order Anseres. Family Anatidæ.

Mute Swan. *Cygnus olor.* Does not need description; the anterior portion of the bill rich reddish-orange, the base to the eye black; has a prominent black knob upon the forehead. (56—60 in.)

Hooper Swan. *C. musicus.* Anterior portion of the bill is black; the base and from base to eye orange-yellow; the black knob is wanting; both species are winter visitants in Egypt and in Mediterranean. (60 in.)

Black Swan. *C. atratus.* General plumage brownish-black, with white markings upon the wings, which, in flight, contrast with the dark colour of the body; bill red with black tip; no knob; South Australia.

Bean Goose. *Anser segetum.* General plumage dark brown; orange-red legs and feet; orange bill marked with black and black tip. (34 in.)


INDIA
BOMBAY
MADRAS
CALCUTTA
Gulf of Siam
Malay Peninsula
Andaman Islands
Nicobar Islands
Laccadive Islands
Gulf of Manaar
Palk Strait
Gulf of Siam
AFGHANISTAN
BALUCHISTAN
CHINESE EMPIRE
SIAM
INDIAN OCEAN
BAY OF BENGAL
Longitude E. 70 of Greenwich

Grey Lag Goose. *A. cinereus.* General plumage brown, with darker stripes on neck and mottled wings; flesh-coloured bill and feet. (34—36 in.)

White-fronted Goose. *A. albifrons.* General plumage as above; white feathers at base of bill and on forehead; darker bands across the breast. (27 in.) All three birds are winter visitors in Egypt.

Flamingo. *Phœnicopterus roseus.* General plumage white with a rosy tint; legs and feet pink; bill pink for two-thirds its length, the rest jet black; Egypt, in flocks. Easily recognized by its long legs and neck and curiously bent bill.

There are about sixty species of Ducks, eight or ten of which may be perhaps seen on migration in the English Channel, in the Mediterranean, or in the lakes of lower Egypt; some even as far south as the Red Sea. Though several species are found on the continent of Australia, they do not seem to have been so frequently observed at any distance off the coast. Their flight is straight and swift, and once recognized will not easily be mistaken. The Mallard, *Anas boschas*, from which the common farmyard duck is descended, may be regarded as the representative of the genus; the Australian form is *Anas superciliosa*. Of the rest perhaps the most readily distinguished will be the

Ruddy Sheld-drake. *Anas rutila.* General plumage orange-brown; buffy-white on shoulders; points of wings and tail black; a black ring round the neck; resident in Egypt. (25—26 in.)

Common Sheld-drake. *A. cornuta.* Glossy green head and neck; white collar; broad chestnut belt across shoulders and breast; dark brown central line along breast and belly; English Channel and Egypt. (24—26 in.)

Shoveller. *A. clypeata.* Dark green head and neck; a broad spoon-shaped bill; Egypt and Red Sea. (20 in.)

Wigeon. *A. penelope.* Head chestnut, creamy white on the crown; chin and breast chestnut; winter visitant in Egypt. (18 in.)

Order Steganopodes. Family Pelecanidæ.

The most obvious external characters of the *Pelecanidæ* are their webbed feet, in which the hind toe is connected with the inner one by a web; their long and powerful wings, and distensible gular pouch.

Red-tailed Tropic Bird. *Phaëton phœnicurus.* The "Bosun (Boatswain) Bird." General plumage silky-white, with a roseate tinge, especially upon the back; in the adult is a broad crescent of black before each eye; flank feathers black; the long central tail feathers are white at the base, and red for the remainder of their length; South and Indian Ocean; hovers round the ship, occasionally settles on the rigging.

Family Spheniscidæ.

Little Penguin. *Spheniscus minor.* General plumage, upper surface light blue with a black line down the centre of each feather; under surfaces white; swims low in the water with great vigour; is incapable of flight; South Australia.

Gannet. *Sula bassana.* "Booby," "Solent," or "Channel Goose." General plumage white; black points to wings; bill horny-white; gular pouch slightly indicated; immature birds brownish-grey; feeds on fish, which it captures by making a sudden descent, often from a considerable height; English Channel, Atlantic, and Mediterranean (in winter). (34—36 in.)

Australian Gannet. *S. australis.* Resembles the last; is seen chiefly on the northern coast of Australia; notice in both birds the peculiar angular appearance of the wings in flight. (34—36 in.)

Black Cormorant. *Phalacrocorax carbo.* General colour dark bottle-green, bare part of face and throat yellow; in breeding plumage, a white patch on thigh; bill sharply hooked; English Channel. (36 in.)

Green Cormorant, or Shag. *P. graculus.* General plumage dark green; no white patch on thigh; English Channel. (27 in.)

New Holland Cormorant. *P. novæ-hollandiæ.* The southern form of *carbo;* in its summer plumage the throat and sides of face are buffy-white. (34—36 in.)

Pied Cormorant. *P. hypoleucus.* Has sides of face and all under surface white; common on south coasts of Australia; these birds fly strongly, with rapid action of the wings, and neck outstretched, following behind one another in a straight line. (33—35 in.)

Frigate Bird. *Tachypetes minor.* "Man-of-War Bird," "Man-of-War Hawk." General plumage brownish-black; orbits and gular pouch deep red; very long wings and tail; the falcons of the sea; like the Skuas, they attack Terns and Gulls, forcing them to disgorge their prey, which, by rapid flight, they catch before it reaches the water. South and tropical Australian shores.

Pelican. *Pelecanus onocratalus.* A large bird, five to six feet in length, with expanse of wings twelve or more feet; white plumage, tinted rose colour; easily recognized by the large gular pouch; in flocks; Lake Menzaleh, etc.

CHAPTER X.

THE STARS.

CONSTELLATIONS.—THE ZODIAC.—THE ECLIPTIC.—THE SOLAR SYSTEM.—HOW TO KNOW THE STARS.—THE PRECESSION OF THE EQUINOXES.—SCINTILLATION.—MOVEMENT OF THE STARS.—UNIVERSAL TIME.

THE following notes on the stars which may be observed during a voyage are by Commander Hull, R.N. :—

From the earliest ages stars have been grouped together into constellations named for the most part after some fancied resemblance to animals. The stars forming these clusters are tabulated in the order of their brightness in each constellation, the principal stars being denoted by letters of the Greek alphabet. A letter, followed by the name of the constellation in Latin, thus, α or Alpha, Lyræ, denotes the brightest star in the Lyre: β Aquilæ, the second brightest in the Eagle, and so on. The order of brilliancy is, however, not strictly adhered to. Some of the more conspicuous are further individualised by time-honoured names, chiefly Arabic. The identification of individual stars, a necessity to the navigator, forms a pleasing and attractive study to the passenger. No more pleasant observatory can be conceived than a comfortable deck-chair on an Orient mail-steamer in the balmy tropics.

Considering the heavens by night at first induces a feeling of wondering bewilderment at the multitude, and apparently inextricable confusion of the stars. But the unchangeableness of their positions has enabled them to be mapped out from a remote antiquity.

The best method of forming an acquaintance with the stars is to confine the attention at first only to the brightest; and the observer will be astonished to find how soon the map of the celestial concave will become familiar to him. It is obvious that certain stars can be seen only from certain parts of the earth. If by means of a celestial globe we represent the heavens as they appear to a spectator residing at the earth's equator, by placing the poles in the horizon, it will readily be seen

that all the stars will be visible to that spectator in the course of the year. If on the other hand, we elevate either the North Pole to the latitude of London, or the South Pole to the latitude of Melbourne, it will be equally manifest that certain stars in the southern hemisphere are never seen in London, nor others belonging to the northern hemisphere in Melbourne. Four maps have therefore been given to assist passengers in their study of the stars, viz., two polar and two equatorial, by which means a fair representation of the heavens is given for any season of the year, or for any part of the world.

The celestial sphere, like the terrestrial ball, has poles and equator, which are simply the poles and equator of the earth, extended to the celestial concave. In addition to these, on the celestial globe, the *great circle* known as the Ecliptic, or sun's apparent path among the fixed stars, with its poles, is also marked.

The Ecliptic is so named because eclipses can occur only when the moon is on or near this great circle.

The Zodiac is a zone or belt in the heavens, 16° in breadth, with the Ecliptic running through its middle. The Zodiac may be described as the high road of the sun, moon, and planets among the fixed stars; as in this belt, the planets visible to the naked eye will always be found. The name is derived from ζώδιον, the diminution of ζῶον, "an animal," because the constellations in the zone were, with one exception (Libra, the balance), figured by the ancients as animals. The Ecliptic, and therefore the Zodiac, is divided into twelve equal parts; the beginning of every part, known as "the first point," is marked by the "sign" or symbol of each; these are taken from the constellations which were situated in them at the time when the names were given. They are as follows:—

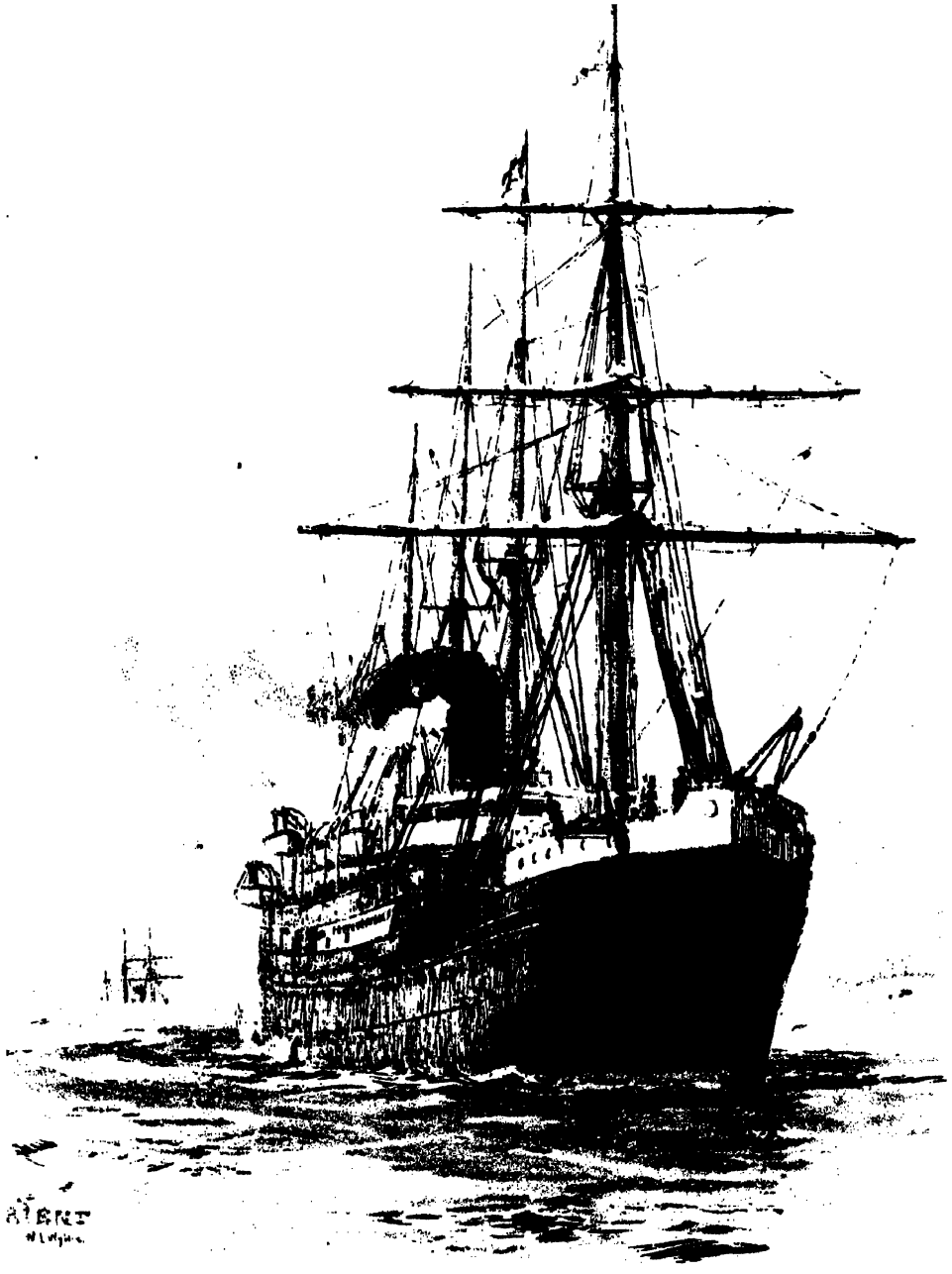
NORTHERN SIGNS.

♈ *Aries*, the Ram.	♋ *Cancer*, the Crab.
♉ *Taurus*, the Bull.	♌ *Leo*, the Lion.
♊ *Gemini*, the Twins.	♍ *Virgo*, the Virgin.

SOUTHERN SIGNS.

♎ *Libra*, the Balance.	♑ *Capricornus*, the Goat.
♏ *Scorpio*, the Scorpion.	♒ *Aquarius*, the Water-bearer.
♐ *Sagitarius*, the Archer.	♓ *Pisces*, the Fishes.

On the star maps it will be seen that the Ecliptic cuts the celestial equator obliquely in two of these points, viz., ♈ and ♎, the first point of Aries, and the first point of Libra, known as the Equinoctial Points; because when the sun is at these points the days and nights are equal all over the world. A great circle, called the


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Equinoctial Colure, passes through these points and the poles of the heavens. It must be remembered that ♈, the first point of Aries, is a most important position in the heavens, being the zero or starting point from which measurements are made. The first points of Cancer and Capricorn, ♋ and ♑, which are most distant from the equator, are called the Solstitial Points. When the sun is at ♋ it is the longest day in the northern hemisphere; when at ♑ it is the longest day in the southern hemisphere. A great circle, known as the Solstitial Colure, also passes through these points, and the poles of the heavens. On the Terrestrial globe or maps the position of a place is found by means of latitude and longitude; on the Celestial globe or maps the position of a heavenly body is found by what is called Declination (Dec.), and Right Ascension (R.A.). These terms correspond to latitude and longitude on the earth; Declination being the distance of a heavenly body directly north or south from the equator, and Right Ascension the distance a heavenly body is eastward, *all round the sphere*, from the Equinoctial Colure, or great circle, that passes through ♈, the first point of Aries. Right Ascension is not given in degrees, but in hours, minutes, and seconds ($^{h.m.s.}$), and is measured on the equator from 0^h to 24^h. The position of the heavenly bodies is also known to astronomers by what is termed celestial latitude and longitude; the latitude being the distance a body may be directly north or south of the Ecliptic; and the longitude the distance a heavenly body may be eastward from a great circle passing through the pole of the Ecliptic and the Equinoctial points. Celestial longitude is measured in ° ′ ″ along the Ecliptic, from 0° to 360°.

As our Solar System, considered to be a circle, whose diameter is sixty times the distance of the earth from the sun, must be taken as the centre of the Celestial sphere, a short description of this system is necessary. It consists first of a great central body, the Sun, stationary and self-luminous. Round this body revolve at increasing distances, in nearly circular orbits, and at different periods of time, small bodies named Planets. These bodies are not self-luminous, but only visible to us by means of the light from the sun. Some of the planets are solitary, others are accompanied by smaller opaque bodies called satellites, which revolve round the planet on whom they attend. There are four small planets near to the sun, viz. Mercury, Venus, the Earth, and Mars; and four large planets more remote, viz., Jupiter, Saturn, Uranus, and Neptune. Between the small and large planets, *i.e.*, between Mars and Jupiter, are a number of minor planets or Asteroids; 260 of these have been already discovered, and many more are believed to exist. There are twenty satellites or moons revolving round some of the planets, making a total of 289 bodies in the system. This is exclusive of the singular objects known

as Comets of which over 220 have been noted. Fifteen comets have been recognized on their return to the sun, but most of these bodies move round the sun in orbits so elongated, and in periods so vast, that their return, although approximately calculated, has not been proved by observation.

The planets Venus, Mars, Saturn, and Jupiter, are generally visible to the naked eye. They appear as large bright stars and may easily be known by their appreciably changing their places in regard to the surrounding heavenly bodies or fixed stars. Hence their name "Planet," from the Greek πλανήτης, "a wanderer." The present position of the planets can easily be found in the *Nautical* or *Whitaker's Almanac*, and so placed temporarily on the star maps, by means of the Right Ascension and Declination. As space will not permit of a longer description of the Solar system, the following elementary table has been inserted :—

SOME ELEMENTS OF THE SOLAR SYSTEM.

Symbol.	Object.	Distance from Sun in Millions of Miles.	Distance from Sun in Radii of Earth's Orbit.	Diameter in Statute Miles.	Density Earth = 1.	Time of Revolution in Orbit.	Time of Rotation on Axis.	No. of Satellites.	Velocity of motion in Miles per Second.
						Years.	d. h. m.		
☉	Sun	—	—	865,000	·25	—	25 12 0	0	4
☿	Mercury	35·9	·387	2,992	1·21	·24	0 24 5	0	30
♀	Venus	67·0	·728	7,660	·92	·62	0 23 21	0	22
⊕	Earth	92·7	1·	7,918	1·	1·	0 23 56	1	19
♂	Mars	141·0	1·524	4,200	·95	1·88	0 24 37	2	15
Minor Planets.	Flora	—	—	—	—	3·27	There were in 1887 260 Minor Planets, Flora being the nearest and Maximiliana the farthest from the Sun.		
	Pallas	253·0	—	600	—	4·60			
	Maximiliana	—	—	—	—	6·32			
♃	Jupiter	482·0	5·203	85,000	·24	11·87	0 9 55	4	8
♄	Saturn	884·0	9·539	71,000	·14	29·46	0 10 14	8	6
♅	Uranus	1780·0	19·182	31,700	·24	84·04	Unknown	4	4
♆	Neptune	2780·0	30.037	24,500	·14	164·65	,,	1	—
		Distance from Earth				d. h. m.	d. h. m.		
☾	Moon	238,000 miles.	—	2,160	·61	27 7 43	27 7 43	—	63

It may startle some to be told that on the clearest night, under the most favourable circumstances, there are only about 2,700 stars visible to the naked eye in the vault of the heavens. Yet such is the fact, as may be proved from a deck-chair by actual counting. With an opera glass or telescope it will be found that by aid of the greater power of the glass there are more visible, and the observer will not be

surprised to hear that astronomers have already counted some twenty millions. But these approximate numbers are much below the real ones: the Milky Way alone contains, according to Herschell, eighteen millions. The Catalogue of Stars of the British Association for the Advancement of Science, contains the position of 8,377 Fixed Stars. Stars differ in brilliancy, and they are divided by astronomers into classes or magnitudes. Stars of the first six magnitudes are, under favourable circumstances, all visible to the naked eye. Of these, there are a few more than 5,100 in number; but they are never all of them above an observer's horizon at the same time. Of stars of the first magnitude there are nineteen; and to know these by name and position is to know the sign-posts of the heavens. The following table of these stars will be found useful when using the star maps:—

List of Stars of the First Magnitude, in order of their R.A.:—

FIRST MAGNITUDE.

North of Equator, *Nine.*			South of Equator, *Ten.*		
Astronomical Names.	Proper Names.	Dec.	Astronomical Names.	Proper Names.	Dec.
		°			°
α Tauri	Aldebaran	16	α Eridani	Achernar	58
α Aurigæ	Capella	46	β Orionis	Rigel	8
α Orionis (variable)	Betelgeuse	7	α Argus	Canopus	53
α Canis Minoris	Procyon	6	α Canis Majoris	Sirius	17
β Geminorum	Pollux	28	α Crucis	——	62
α Leonis	Regulus	13	α Virginis	Spica	11
α Bootes	Arcturus	20	β Centauri	——	60
α Lyræ	Vega	39	α Centauri	——	60
α Aquilæ	Altair	9	α Scorpii	Antares	26
			α Piscis Australis	Fomalhaut	30

Beginning with the north polar map, the Great and Little Bears will be easily recognized. The North Pole is close to the Pole Star, the last star in the tail of the Little Bear. Two large stars of the conspicuous four in the Great Bear, α and β, known as the "pointers," point to this important star. All are of the second magnitude. On the opposite side of the Pole to the tail of the Great Bear, and about the same distance from the Pole, is the constellation of Cassiopeia, in the shape of a bad W, familiarly known as the Lady's Chair. If an imaginary line be drawn from the four stars of the Great Bear, through the four stars of the Little Bear, it will lead to Deneb, the bright star in Cygnus, a constellation forming a great cross of five stars, Deneb being the northern star. A line drawn through the

northern stars of the quadrilateral in the Great Bear will lead to Capella, the northern bright star in Auriga, a constellation of five stars in the form of a large irregular pentagon. Capella may also be known by three small stars called "the Kids," in the form of a little isosceles triangle lying close to the southward of it. On the opposite side of the Pole to Capella, and about the same distance from it, are a group of four smaller stars known as the Dragon's Head, one diagonal of which will point to Vega, the bright star in Lyra, marked by a parallelogram of small stars lying to the southward of it. Between Cassiopeia and the Dragon's Head are two stars in Cepheus pointing directly towards the Pole, and lying rather nearer to it than "the pointers." Between Capella and Cassiopeia lie the two bright stars Mirfak and Algol, in Perseus, also pointing in the direction of the Pole.

Next taking the map of the "Southern Signs of the Zodiac" in hand, and looking at the heavens it will be seen that if the tail of the Great Bear is continued in the same curve it will lead the eye first to Arcturus, the brightest star in Bootes, and then to Spica, the great star in Virgo. Continuing the line from the Dragon's Head through Vega, will lead to Altair in Aquila, equally recognized as a brilliant star lying close to, and midway between two lesser stars. These three stars, Deneb, Vega, and Altair, form a great triangle in the heavens. Directly south of Cassiopeia, a great square of four stars will be seen, known as the "Square of Pegasus." The two northern stars are named Alpheratz and Scheat, the two southern, Algenib and Markab. From Alpheratz three stars forming a tail similar, but much larger, than that of the Great Bear, trend towards Perseus, the last star being Algol in that constellation. A line drawn through Scheat and Markab to the southward will pass through the first magnitude star, Fomalhaut in Piscis Australis. To the south-west of Spica is the small constellation of Corvus with two stars of the second magnitude. This group is not so much like a crow as it is like a boat's lug sail, the yard of which points to Spica Virginis.

Between Vega and Arcturus, but nearer the latter, lies the beautiful little constellation Corona Borealis, a ring of stars with a bright one called Alphacca. A line from the northern pointer Dubhe through Phecda—the diagonally opposite star in Ursa Major—will lead to a star called Cor Caroli. A line from this star through Alphacca will lead to two stars lying close together, α Herculis and α Ophiuchi. Eastward from Spica and on a line from the last star in the tail of the Great Bear through Arcturus are the two stars of Libra. The southern of these stars, Zuben el Genubi, may have been the foundation star of the Egyptian calendar, supposed to have been initiated about 1322 B.C., as at that time the first point of Libra, ♎ or "Thot" of the Egyptian Zodiac, was very near to α Libræ.

A line through Spica and Zuben el Genubi will lead towards Antares, the great red star of Scorpio. This constellation passing the meridian at midnight in the end of May, has some resemblance to the creature whose name it bears, the curved tail and two stars forming the sting being a prominent feature in the sky. A line from Zuben el Genubi through Antares will lead to ε Sagittarii, Kaus Australis, with another bright star to north-east. A line drawn southward through Alpheratz and Markab, the diagonal of the Square of Pegasus, will lead to α and β Aquarii, Sadalmelek, and Sadalsund.

Turning to the Map "Northern Signs of the Zodiac," near the centre will be seen the great constellation of the northern winter sky, the splendid group of Orion. A line from the Pole star through Capella will lead to this cluster. Within a trapezium of four large stars, two of them—Betelgeuse in the north and Rigel in the south—being of the first magnitude, lies Orion's belt, formed by three stars. Northward, the line of the belt points to the beautiful clusters of the Hyades and Pleiades in Taurus, in the former of which lies the great red Aldebaran. Southward, Orion's belt leads to Sirius, the Dog star, the most brilliant of the heavenly bodies. A line from Rigel through the middle of the belt will guide the eye to Castor and Pollux in Gemini; while directly south from the twins and about midway between them and Sirius is Procyon in Canis Minor.

About half way on a line drawn from the Pleiades to Algenib, the south-eastern star of the Square of Pegasus, lies Hamel, the principal star in Aries. In the days of Hipparchus, about 150 B.C., the first point of Aries, ♈, was just south of this star. To the southward, forming an equilateral triangle with Hamel and the Pleiades, will be seen Menkar in Cetus.

Turning to the map of the "South Pole," the most conspicuous constellations are Crux, Centaurus, and Argo. Crux, the Southern Cross, is a small but brilliant group, the distance between the stars forming the head and foot being little more than that between the pointers to the northern Pole star. These two stars point to the South Pole, and also to Achernar, the bright star in Eridanus. α Crucis, the foot of the cross, lies nearest to the pole, and when passing the meridian the cross is nearly erect, To the left of the cross, when on the meridian, and pointing towards it, are α and β Centauri, both of the first magnitude; while on the other side of the cross, and at right angles to a line drawn from the pole to the cross, is Canopus, the brightest star in Argo Navis.

The South Pole lies nearly midway, and on a line drawn from the cross to Achernar. It has no star of any brilliancy in its vicinity, although within three-quarters of a degree of the pole lies σ Octantis, a small star of the sixth magnitude.

In this part of the heavens will be seen the singular nebulous spots known as the Magellanic clouds, the larger between the pole and Canopus, the smaller between the pole and Achernar. A bright star in Hydrus lies between these clouds. Directly under the pole, and in line with the cross, is the principal star in Phœnix. A line from Canopus drawn through the large Magellanic clouds leads to α Pavonis. α Gruis lies between that star and Fomalhaut, while α Trianguli Australis will be found about midway between α Pavonis and the Southern Cross. About midnight, at the end of March and beginning of April, after passing the Dædalus light in the Red Sea, the Southern Cross, with α and β Centauri, will be visible; the Great Bear will also be in sight to the northward.

It is here thought necessary to call attention to the important astronomical phenomenon known as the Precession of the Equinoxes. The position of the North Pole of the heavens is indicated by a bright star known as Polaris, or the Pole Star, which lies in its immediate vicinity. But it must be remembered that this Pole is not fixed, but is a point moving slowly among the fixed stars. The Pole is now approaching Polaris, will be nearest to it in 2120 A.D., after which it will recede from it, and for 250 centuries, Polaris, or as the Arabs named it, Kaukab al Shemal, will cease to be the Pole Star.

This movement of the Pole is the result of the attractive action of the sun, moon and planets on the protuberant matter about the earth's equator, causing the axis of the earth to change its direction and assume a conical motion, like that of a peg-top when it loses its speed. "This toy," says Sir John Herschell, "illustrates the whole phenomenon" of the Precession of the Equinoxes. The pole has therefore a slow motion, completing a small circle round the Pole of the Ecliptic in 25,867 years; and may be considered as the Second hand of Time on the dial of the Great Clock of Eternity. This small circle has been drawn on the Polar maps.

Hence, the earth is always changing the Pole Star. After 2120 A.D., the Pole will, receding from Polaris, pass through Cepheus and Cygnus to Lyra, when in 14,120 A.D., Vega will be the brightest star in the vicinity of the Pole. Then passing through Hercules and Draco, the Pole will return to Ursa Minor. In the days of the building of the Pyramids, α Draconis, Thuban, was the Pole Star, γ and δ Ursa Majoris being the pointers. Similarly in the southern hemisphere, Canopus will be the bright star in the vicinity of the South Pole, ν Argus being the Pole Star about the same time as Vega is nearest to the North Pole.

This conical motion of the earth's axis changing the position of the Poles in the heavens naturally causes a similar motion of the equinoctial points. As the Pole moves slowly round the Pole of the Ecliptic, so will these points move

along the Ecliptic at the rate of one degree in about seventy-two years, the average duration of man's life. This fact will explain to the observant passenger why, on the star map, the symbols marking the "first points," or beginning of the Signs of the *Z*odiac, are removed some 30° from the constellation that bears the name of the same sign. For instance, between ♈ and ♉, the symbols representing the "first points" of Aries and Taurus, lie the stars forming the constellation of Pisces, between ♉ and ♊, or Taurus and Gemini, the stars of Aries are found and so on. The cause for this is, when the "first points" of the Signs of the *Z*odiac were adopted by Hipparchus, about 150 B.C., that of the Vernal Equinox, ♈ Aries, stood under Hamel, the bright star of that constellation when on the meridian. Similarly, at the establishment of the Egyptian Calendar in 1322 B.C., ♎ the first point of Libra, "Thot" of the Egyptians, stood almost on *Z*uben al Genubi, α Libræ; *Z*uben al Shemali, β Libræ, when on the meridian standing directly over it. At present these stars are forty-three degrees or nearly a sign and a half from the first point of Libra. From the above it will be seen that although the declination, right ascension, and celestial longitudes of the fixed stars are slowly but continuously changing, there is little or no change in celestial latitudes; the Ecliptic and its poles holding an invariable position with respect to the fixed stars.

In the temperate regions all stars scintillate; but this luminous movement varies with the degree of purity of the sky, the elevation of the stars, and the temperature of the night. This twinkling or scintillation, Arago explained, is caused by the "difference of velocity of the various coloured rays penetrating the unequally warm, unequally dense, unequally humid layers of atmosphere surrounding this earth." These layers are fewer overhead; in the tropics they are usually more equable and homogeneous than in the temperate zones, and consequently scintillation is rarely observed in stars whose altitude exceeds fifteen degrees. "This circumstance," says Humboldt, "gives to the celestial vault of the tropics a particular calm and soft character." Planets scintillate but little, Saturn and Jupiter rarely, but the movement is more perceptible in Mars, Mercury, and Venus.

There are two stars in Centaurus that point to the Southern Cross. The one of these farthest from the Cross is generally regarded as the fixed star that is nearest to the earth; but its distance is 211,330 times that of the sun from the earth. Sirius and Vega are distant over 1,300,000 radii of the earth's orbit; while Capella's distance is said to be as much as 4,484,000 radii. Such distances are almost inconceivable. Supposing one could journey to the sun in one day, it would take about 578 years to reach this nearest star—α Centauri. The diameter

of the earth's orbit, over 185,000,000 miles, becomes, with regard to a vast majority of the fixed stars, a point! It is no wonder that at such distances even the most powerful telescopes are unable to show any appreciable disc in stars.

Fixed stars, in spite of their apparent fixity, do however move. Our own sun, a fixed star to others, travelling with his system of planets in some enormous orbit, is at present moving towards a point in the constellation of Hercules, at a supposed rate of four miles per second. The centre round which the sun's orbit lies is supposed to be near the Pleiades. The rate of motion of Arcturus, Capella, Sirius, Vega, and α Centauri has also been determined. And all other star systems are moving "in their courses," "circling obedient round mightier orbs," but through their enormous distance their motion is to us very small. It has taken the nearest star to us, α Centauri, 500 years to travel over a portion of the heavens as long as the apparent diameter of the moon.

As with the lighthouses on the earth we have fixed or permanent and revolving lights, so in the heavens some stars shine with a permanent and persistent light, while of others the brilliancy waxes and wanes, and sometimes they disappear altogether. In the Whale is the star Mira, *o* Ceti, which each year is practically invisible for five months. After this, for three months, its brilliancy increases till it approaches the second magnitude, and in 1799 it was as bright as its neighbour, Aldebaran. It remains at its greatest brilliancy about a fortnight, then wanes, and in three months more is again invisible to the naked eye. In Perseus, Algol, a star of the second magnitude, for two days, thirteen hours, and twenty minutes, suddenly decreases in brilliancy, and in three hours and thirty minutes descends to the fourth magnitude. Remaining thus for about twenty minutes, it begins to increase, and in three hours and thirty minutes regains the second magnitude. All these changes are thus effected in less than three days. The four stars in the body of the Great Bear were, in the seventeenth century, of similar magnitude. One has since then fallen off considerably in brilliancy. In Orion, the star Betelgeuse alters in magnitude during a regular period of 200 days. In November, 1572, a large star suddenly appeared in Cassiopeia, and soon rivalled Sirius in brilliancy. In March, 1573, it began to lose its lustre, and in March, 1574, it had completely disappeared. It was at the first white in colour, and then yellow, and then red. Similar apparitions, in approximately the same position, were recorded in 945, and again in 1264. The year 1885 was a middle date for a return of the maximum brilliancy of this star. As its re-appearance has not yet been observed, the passenger will have an additional incentive to watch the constellation of Cassiopeia. One of the most curious objects in the southern skies is η Argus, a star on the opposite side of the cross to α and β

Centauri, and nearly the same distance from it. This star, in about 1670, was only of the fourth magnitude, in 1750 it attained the second; from this it decreased until 1826, after which date it passed through astonishing phases, attaining in 1838 the brilliancy of *a* Centauri, and in 1843 nearly rivalling Sirius. It is now barely visible to the naked eye.

Closely connected with these phenomena is the fact that stars vary in colour, not only as compared with one another, but in themselves from time to time. Aldebaran and Betelgeuse, near together in Orion and Taurus, are distinctly red, as may be seen by comparing them with their white neighbours, Sirius and Regulus in Leo. The Greeks recognized only red and white stars, but modern astronomy recognizes a large variety of tints; Aldebaran, Betelgeuse, Arcturus, and Antares are decidedly red. Capella, the Pole Star, and Procyon are yellow, Castor is distinctly green, and Vega is blue. In long periods of time, stars change their colour; Sirius, now a brilliant white, was reported red by the ancients.

Over six thousand of the stars we know when observed through the telescope, show that they are made up of two or more stars. In the middle of Orion there is a star, θ, which when seen through a powerful telescope is found to form a group of no less than seven stars; while ϵ Lyræ close to Vega, consists of two couples or two pairs of stars, appearing to the eye as one star. Of the 6,000 stars, 650 are called Binary—*i.e.*, two suns turning round a common centre of gravity. In the double star no movement of revolution can be detected; the smaller star, has, therefore, been called a "companion" to the larger. The Pole Star, Vega, Altair, and Aldebaran have companions. In the Binary stars a decided period of revolution has been discovered. Herschell gives a table of twenty-one Binary stars, whose periods of revolution vary from 31 to 737 years; *a* Centauri is a Binary star, and in 1862, Sirius was found to have a secondary sun revolving round it. Many of these double stars are coloured, all shades being met with.

Clusters of stars are seen in many places in the heavens; sometimes these are mere effects of perspective, but in other cases stars appear to congregate in such close vicinity that it is impossible not to recognize them as stellar groups—real systems of suns. Of the clusters remarkable for richness and brilliancy of the individual stars that in Perseus is a striking example, and one of the most glorious objects in the heavens; it lies between the bright stars of Cassiopeia and Perseus, a dull spot to the unaided eye, but even a small telescope will discover its marvellous beauties. The cluster in Hercules, visible to the eye as a luminous spot, is estimated to contain 1,000 to 2,000 stars.

The Milky Way may be considered as a star cluster, consisting of eighteen million visibly separate stars. It follows nearly the circumference of a great circle in the heavens. From Cygnus to Centaurus the Milky Way is split into two parts forming a kind of gap through which the dark space beyond is seen. In the midst of the bright mass surrounding Crux and α and β Centauri is a singular dark pear-shaped vacancy, called by the early southern navigators the *Coal-sack*. In this dark space there is only one small star visible to the naked eye: though it is far from devoid of telescopic stars, so that its striking blackness is simply due to the effect of contrast with the brilliant ground surrounding it. Sir W. Herschell compared the Milky Way to a great mill-stone in shape, the rim split open into two for nearly one-half of its circumference.

Nebulæ, formerly supposed to be composed of an aggregation of innumerable stars, are now known to be glowing masses of gas, not moving like comets, but retaining their position like the fixed stars. The celestial concave is strewn with nebulæ of various sizes, brilliancy, and character. One of the most remarkable is that named θ Orionis, the multiple star already described. Another great nebula is found in Andromeda a little east of a line drawn from Alpheratz and Algenib of the Square of Pegasus. In August, 1885, after an increase in the brilliancy of this nebula, a new star, *Nova Andromedæ*, appeared in it.

Near the South Pole are the two great Nebulæ known as the Magellanic clouds: these half stellar, half nebulous systems, easily seen with the naked eye on a clear moonless night, are distinguished from other nebulæ by their great dimensions and their physical structure.

Shooting Stars belong to systems of bodies travelling in orbits of all degrees of eccentricities around the sun. The earth encounters more than a hundred such systems in the course of her annual revolution. The two most remarkable of these systems are met with on the 10th August and 11th November. These meteors are emitted from the same part of the heavens, called the *radiant* point; those of August come from γ Persei, those of November from μ Leonis. The November meteors revolve round the sun in about thirty-three-and-a-half years in an orbit similar in eccentricity to that of the comets. The shooting stars gleam with an incandescence due to the friction they encounter on entering our denser atmosphere, which frequently ends in consuming them altogether.

Then there are the comets, combinations of gaseous matter, and kernels of dust, which Mr. Huggins, by means of his successful spectroscopic observations, has shown to shine both by the reflected light of the sun and by their own innate incandescence; and which seem, in appropriate relation to this double

character of their light, to travel into and also out of the limits of our solar system.

The Zodiacal Light is a phenomenon of much interest often witnessed at sea under favourable circumstances, according to the ship's position and time of the year. In European evenings at the time of the vernal equinox when the twilight is of short duration, a faint but beautiful light in the form of a lenticular cone, its base towards the sea, may be seen extending from that part of the horizon where the sun has set, some distance up into the heavens in the direction of the Zodiac, hence the name. It is also seen in Europe before sunrise in the mornings of the autumnal equinox. In the tropical zones the Zodiacal Light increases in intensity and altitude and can be seen throughout the year. Humboldt describes it when seen from the table-lands of Quito, and from the Mexican lakes, as at times surpassing in brilliancy the most striking parts of the Milky Way. The Zodiacal Light is generally supposed to be a flattened nebulous ring surrounding the sun in the plane of the ecliptic, extending as far as, or even beyond, the orbit of the earth.

Mr. Norman Lockyer, C.B., F.R.S., contributes some remarks on Stars and Time :—

In the preceding chapters we have seen how to the student of Natural Science a sea voyage is a never-failing source of delight; it must not be imagined, however, that there are not phenomena to be studied from day to day, which are quite as interesting to lovers of the various branches of Physical Science.

One of the most remarkable experiments in the domain of Physical Science made during the present century, has been that which we owe to the genius of the illustrious Foucault, who has demonstrated for us, after so many thousand years of doubt, the earth's daily rotation on its axis. Now, the various results of this rotation can nowhere better be studied than at sea, especially on such a voyage as between England and Australia, which are nearly antipodal to each other; and there is an especial interest in these results just now for the reason that the time arrangements of our planet are about to be considerably altered and improved. On these grounds, therefore, we purpose to show in the present chapter how a voyage in an Orient steamer in either direction may be utilised in acquiring accurate information on a subject of world-wide interest.

The question of longitude of course forms a part of the main subject; we shall, however, have to treat it in a general way, in order to state more fully the various alterations in the planet's time arrangements to which we have already referred.

To begin at the beginning. Before the earth's rotation was accepted, we find the world known to the ancients to be that part of our planet bounded on the north

by the Baltic and Black Sea; and on the west by the Shetlands, Ireland, the coast of Spain, and a part of Africa; on the east by Ceylon and on the south by an imaginary sea. Long before observations of latitude and longitude in the present sense were thought of, the ancients knew that the length, or longitude, of the world as they then knew it, from Spain to Ceylon, was greater than its breadth or latitude, from the imaginary sea to the Baltic; and in the two dimensions of the oblong world imagined by them, we have the origin of the terms longitude and latitude, which are still retained though we are dealing with a sphere.

Again before they knew the world was round, they attempted to lay down lines showing latitudes and longitudes. The way for this was prepared by the elaborate records and studies of Eratosthenes touching the various distances in stadia from one place to another; coupled with the fact that was then established, that this oblong world of theirs really was laid out on a spherical surface, and not on a flat one; it was seen that the lines of longitude must pass through the poles of the sphere, and that the lines showing latitudes must be parallel to its equator; they also saw that to deal with longitude accurately, one of the semicircles must be taken as a starting point, this they called *primus meridianus*—the origin of the words prime meridian, about which we shall hear so much in the next few years. In the first maps which were prepared by Marinus of Tyre and Ptolemy, two centuries after Christ, the top of the map was north and the left hand west; and although this was reversed for a time by the Arabs, because they wrote from right to left, the first mode has remained down to our own day. It was imagined that the prime meridian should pass through the most westerly point of the known world, which was then Cape St. Vincent, in the region which they had most closely studied, and this strangely enough passed through the eastern portion of Britannia, and very near the Shetlands, the Ultima Thule of the ancient geographers; we may say, in short, that the first meridian known, so far as England was concerned, passed very near the present meridian at Greenwich.

The next geographical discovery made was that the Fortunate Islands, now called the Canaries, in which the imagination of the Greeks had placed the Gardens of the Hesperides and all their delights, had a more westerly longitude than the Sacred Promontory, now Cape St. Vincent, and maps were therefore constructed with this prime meridian. Such a map, showing the world according to Ptolemy's ideas, with the longitude reckoned from the Fortunate Islands, is given in illustration of this article.* Some more accurate geographers, however, rebelled against this,

* The Map is based upon a larger one, given by Bunbury in his admirable *History of Ancient Geography* (Murray).

for the reason that it was difficult to determine the exact longitude of the islands; these geographers therefore preferred to place the prime meridian so that it passed through the most westerly point of Africa, adjacent to the islands; and this prime meridian was favoured by the Arab geographers. Later on it varied to points even to the west of the Fortunate Islands, and at last settled down on Ferro, one of the Canaries, till such time as the observatories of Paris and Greenwich were founded. Since then other prime meridians have been introduced, and we may fairly say that nowadays the confusion in our maps, owing to this circumstance, is greater than it ever was at the time when a knowledge of geography was confined to the students in the great Alexandrine or Arab Schools.

No prime meridian, for instance, ever passed through Alexandria. But what the Arabs were greatly interested in was the meridian running from north to south, and dividing the known world into two equal portions, one east and the other west. Where this line cut the equator was, according to them, the centre of the earth, or, at least, of its surface, having no latitude, and situated at equal distances, 90°, from the four cardinal points of the earth. Here they imagined the famous Dome of Azin or Arin, an enchanted temple or castle most difficult of approach. According to the opinions of some, in it was to be seen the throne of Iblis, and it was the home of demons. The Persians and others believed this to be the centre of created things and of their contrasts, and stories fabulous and impious are told of its inhabitants, who were called Manichæans.

The first demonstration of the fact that differences of longitude are associated with differences of local time is to be found in *Pliny's Natural History;* but this fact, which comes out so strongly in a sea voyage, was cloaked to the ancients by the other fact that their division of the day into hours was so widely different from our own. They had only the sun-dial to guide them, and this being so, they made the best of the matter by dividing the intervals between sunrise and sunset, and sunset and sunrise, into twelve hours, the lengths of which of course varied at different times of the year; so that in England the day hours in summer were twice as long as they were in winter. It was the influence of Ptolemy which eventually got rid of this inconvenient arrangement; and as a result of the change of idea we have our clocks, which date from the thirteenth century, dividing the earth's rotation into two periods of twelve hours. This is the origin of our ordinary time, one series of twelve hours beginning at midnight, another series at noon; a day, say the 1st of January, beginning immediately after midnight of the 31st December.

The preceding is a rough statement, which we must now elaborate somewhat.

The time used in astronomical observatories is not ordinary time, it is star time —a thing vastly different. We know that the earth goes round the sun, and we also know that the stars are so far away that from whatever point of the earth's orbit we regard them they always lie in the same direction; if a telescope, therefore, could always be bracketed on to the same star during a whole year, the telescope would always remain parallel to itself; the exact period of the earth's rotation therefore is accurately determined by observing the same star with a telescope in the same position on any particular night and on the following one; this period has been divided into twenty-four sidereal hours, each consisting of sixty sidereal minutes, each consisting of sixty sidereal seconds; and it is obvious that by watching the stars by an accurate clock, and taking some part of the heavens as a start point, the same methods which has enabled us to lay down various places and points on the earth with their proper latitudes and longitudes, will allow us to map down the stars in like fashion with reference to the earth's rotation, its poles and its equator. Thus we have the celestial equator, the celestial poles; the position of stars, north and south of the celestial equator are defined by their Declination, the equivalent of our latitude; and the distance from the celestial prime meridian, which passes through the first point of the sign Aries, defined by their Right Ascension, the equivalent of our longitude reckoned east from Greenwich. This star time begins when the first point of Aries crosses the meridian of any observatory, and is counted through twenty-four hours to the next transit of the same point.

But, however important this sidereal time may be for recording the exact period of the earth's rotation and all that follows from it, it is useless for the purposes of ordinary life, for the reason that twelve o'clock, say, would mean, at one time of the year, the middle of the day, at another midnight; at another the time of sunrise, at another the time of sunset. Astronomers, however, use it to get another time which is much more adapted for the ordinary purposes of life. This time has reference to the sun instead of to the stars, and is so arranged that its start point is always exactly noon; like sidereal time, it runs through twenty-four hours; this is termed astronomical mean (or average) time, for the reason that true sun time, such as that shown by a sundial, is for two chief reasons, which we need not refer to here, too irregular for astronomical use. To bring about perfect regularity and precision astronomers make use of an imaginary sun going at an equal rate along the celestial equator, instead of the true sun going with a variable rate along the ecliptic; and the length of the mean or average solar day is the average of all the true solar days in the year.

We have now, then, passed from star time to mean astronomical time, each running from one to twenty-four hours, the former beginning with the transit of the first point of Aries, which may happen at any time of the day or night, the latter with the transit of the mean sun over the meridian of a place, which can only happen at noon. There is yet something wanting for the purposes of civil life. The astronomical day—that regulated by the mean sun—begins at noon, whereas, as already has been pointed out, our day naturally begins at midnight. We have then yet a third kind of time, which is called civil time, and this is the time used for the purposes of ordinary life. It begins at mean midnight and runs to the next mean midnight, two batches of twelve hours intervening instead of one batch of twenty-four. The length of the civil day is the same as the length of the astronomical mean day, only the start point is different, and therefore the length of the hours, minutes, and seconds are the same, all of them being slightly longer than their equivalents in sidereal time; the reason of this is that in consequence of the earth's motion round the sun, which is from west to east, after a place on the earth's surface has got to the same position with regard to the same star after one rotation from west to east, it is not yet in the same position with regard to the sun which it occupied yesterday; it has still to travel through a small angle, and the time spent in travelling this small additional angle necessitates that the hours, etc., of sun time shall be slightly longer than the hours, etc., of star time.

It will be seen then that at the present day we are in a muddle both as regard longitudes and as regards time. Neither of these muddles touches the person who stays at home and who interests himself merely in his own personal affairs. It is only the traveller who feels the loss of time spent in comparing maps, the longitudes of which start from different prime meridians, take English and French maps as an instance. It is only the man who has large telegraphic dealings with every part of the world, or who takes long journeys frequently, or who studies phenomena which interest every part of the world alike, who has to face the difficulties encountered in turning a hundred local times into the time of his own place, be that London or Melbourne.

The loss of time and labour involved in this way has at last attracted such general attention that a Conference was called together by the American government four years ago to consider the whole question; and the proposals of this Conference —wise and important proposals—are before all the civilised countries of the world, and have been generally approved.

The first resolution adopted was that in the matter of prime meridians we shall go back to the condition of things in Ptolemy's time, that is to say, there shall be but

one, and that one is to be that which passes through the central wire of the transit instrument of the Royal Observatory at Greenwich. When this is acted upon, in course of years all navigators who make the voyage from Europe to Australia, or any other, will use maps in which the longitudes of the various places, like the latitudes, shall be independent of the origin of the maps; and this will be a great boon for travellers, inasmuch as it will do away with all risks arising from any inaccuracy or neglect in allowing for the differences of longitudes now shown in different maps for the same stretch of ocean.

Next the Conference proposed that the present arrangement of reckoning 180° longitude east and west from the prime meridian is to stand. The various longitudes, therefore, between England and Australia will remain as they exist at present on English charts, instead of being all changed, as they would have been, if, as was proposed by some, the longitude should have been reckoned through 360°, going westward. This arrangement, also, has the advantage of retaining the days as they are near the meridian of 180°. It is known that some islands, not very distant from Australia, were discovered by vessels going eastward and meeting the sun, and others going westward, or with it; hence the day carried to these islands was different, according to the direction in which they were reached.

We pass now from longitude to time. In this matter the new proposal is that there shall be a something else in the way of time at each place, besides its own local time; that instead of there being a day, or a period of twenty-four hours, only for each place, that there shall be a day, or period of twenty-four hours, for the planet taken as a whole; this day is to begin at mean midnight of the prime meridian, and is to be counted through twenty-four hours to the next mean midnight.

Now here a very important point comes in. This, of course, is astronomical time, *par excellence*, and yet the Conference proposed that it shall begin at mean midnight, instead of at mean noon, as at present astronomical time does; it will, therefore, run on all fours with civil time, for the first twelve hours at all events, that is, till the next noon, when civil time begins again. The Conference proposed, not only that astronomical mean time shall begin at midnight, but that civil time shall run from one up to twenty-four hours.

It requires scarcely a moment's thought to see the enormous simplification of our time arrangements which will be brought about when these resolutions are carried out. Locally, the difference between a.m. and p.m. will be abolished. Astronomical mean time and civil time will always be the same, and any confusion which at present arises from things as they are will at once be abolished, while civil time will go on being used as it is for all the ordinary purposes of life. The new Universal Time

will, of course, be something additional at each place, to be used especially for those purposes for which it will be more convenient. These purposes will be telegraphic or astronomical, to begin with, but will not long be thus limited.

Travellers will be specially interested in this new universal time, whether they travel by land or sea, for the reason that in future all changes of time depending upon change of longitude, whether in a long land journey across a continent like America, or in a long sea journey, will be made in hours or half-hours, starting from the prime meridian.

Watches will not be changed according to the time of the prime meridian of each country, but according to the distance from the prime meridian of the planet. In America, for instance, at the present moment, there are five times shown by the clocks from the Atlantic to the Pacific sea-board: we have Inter-colonial time, Eastern time, Central time, Mountain time, and Pacific time. All represent even hours of Greenwich time, so that an English watch will only require its hour hand altering from one ocean to another; the minutes and seconds will be Greenwich minutes and seconds, only the hours will vary. What the Americans have done in this way for the map of America, will in time be done for the whole planet; each difference of longitude of 15°, or each difference in time of one hour from Greenwich, will have a distinct name given to it, and probably for special purposes special names will be given. I submit with the present article maps showing how this may be worked out for the planet generally, the names of the standard times being suggestions only, and also in the Track Chart I have given names convenient for the special needs of a voyage to or from Australia. In the chart I have naturally chosen as a designation for each difference of an hour from Greenwich the names of those English possessions which lie most directly under the meridian in question passed by an Orient steamer, whether steaming through the Canal or round the Cape.

It is a curious thing that in this addition to the Track Chart it has come out that the various English dependencies and colonies, or definite parts of them, lie as nearly as may be one hour apart. Thus Malta and the Cape are one hour east of London, Cyprus and Natal two hours, Aden three hours, Mauritius four hours, Bombay five hours, Calcutta six hours, Singapore seven hours, West Australia eight hours, Central Australia nine hours, and Eastern Australia ten hours—quite near enough for our present purpose.

I do not for one moment propose to suggest that watches at sea shall be altered according to these new times, because if the ship-clocks are altered in this way without the interpolation of an additional meal on the days on which they are altered on a voyage from Australia, there will probably be a good deal of discontent on board. If

this difficulty, however, can be got over, it will be obvious that the time shown by all the watches and clocks in the world may indicate true Greenwich minutes and seconds, and that in all changes necessitated by differences of longitude the hour hand alone need be altered. Indeed, I can imagine the traveller's watch of the future showing minutes and seconds apart from any locality, the Greenwich hour being given on one dial and the local hour on another.

NOTE ON THE NAMES OF STARS.

Among the principal stars mentioned in the foregoing chapter we have some with Greek and Latin names, and a great many more with names corrupted so much from Arabic words that in some cases it is not possible to discover the derivation; here we shall only mention stars of the first magnitude:—

Aldebaran, is the first star in *Taurus*, Arabic, "the follower," because it follows the Pleiades.
Capella, α Aurigæ, Latin, "a little goat."
Betelgeuse, α Orionis, Arabic, *Beyt al Agoos*, "the old man's house."
Procyon, α Canis Minoris, Greek, "before the dog."
Pollux, β Geminorum, Greek, the twin brother of Castor.
Regulus, α Leonis, Latin, diminutive of *Rex*, "a king."
Arcturus, α Bootes, Greek, "the great bear."
Vega, α Lyræ, Arabic, *al nasr al wakih*, "the falling vulture."
Altair, α Aquilæ, Arabic, *al tayr*, "the eagle."
Achernar, α Eridani, Arabic, *achir al nahr*, "the end of the river."
Rigel, β Orionis, Arabic, *Rigl*, "a foot" (of Orion).
Canopus, α Argus, Greek, name of a town in Egypt.
Sirius, α Canis Majoris, Greek, hot, scorching: "the dog star."
Spica, α Virginis, Latin, "an ear of corn."
Antares, α Scorpii, Arabic, Antar, proper name of a legendary giant.
Fomalhaut, α Piscis Australis, Arabic, *fum al hût*, "the whale's mouth."

CHAPTER XI.

THE SHIP.

A GREAT MAIL STEAMER.—THE OPHIR.—THE ENGINES.—ELECTRIC LIGHTING.—THE FREEZING CHAMBER.—HYDRAULIC MACHINERY.—THE MARINER'S COMPASS.—THE MAGNETIC POLE.—THE LOG.

WHEN the Orient Line began to run, in 1877, the steamers made the passage by the Cape of Good Hope. Now, improvements in engine-building, improvements in the Suez Canal, and, above all, a change in the design of the larger passenger steamers, have combined to revolutionise all the conditions of transit. What used to be thought an achievement, to be essayed perhaps once in a lifetime, a voyage to Australia and back, is so short and so easy that many make it a rule to run out or home, as the case may be, at least once in a year, whether for business or pleasure. The colonies and England are brought nearer to each other, as if the actual mileage had been diminished.

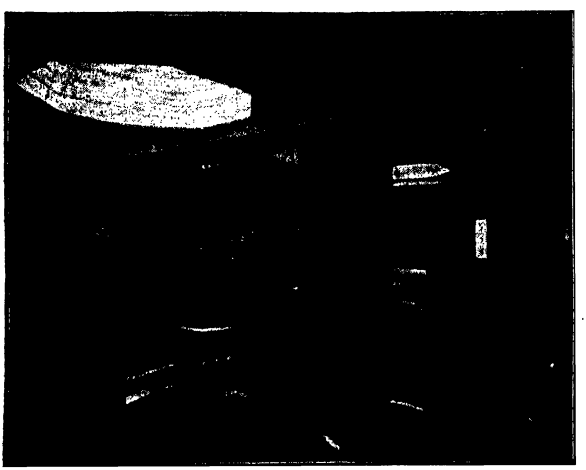


GRAND STAIRWAY ON AN ORIENT LINER.

The modern mail steamer will generally be found to follow one or other of two essentially different patterns. This comes out clearly when we think of what were the conditions under which the first steamers were built. They were sailing ships with paddle wheels, at first, and subsequently with screws. The sailing ship was the model after which all the earlier steamers were constructed. The first-class cabin accommodation was always aft, and the second class forward, and as a rule

there were three masts, with yards on the two forward masts, and the sails were largely relied on for the safety of the ship.

A new pattern has now come into vogue; and even the old sailor must allow that it is by vessels of the new type that the greatest triumphs have been won, the greatest victories over time and space. Instead of masts the new ships have poles useful for signalling purposes. The first-class accommodation is before the engines, where you need seldom hear or feel a turn of the screw. The first-class promenade is on the uppermost deck amidships. The second-class promenade is right aft. The vessel is not a modified sailing-ship, but a steamer expressly built for going by steam alone and not by wind. Once this principle was grasped, almost everything else was modified, and not only is a steamer of this new type different in appearance and arrangements from one of the sailing-ship type, but the mode of life of the passenger is wholly changed. He finds himself living in a hotel, surrounded by the ordinary luxuries of a hotel, but with the further advantage that his residence itself and his fellow sojourners in it, are being carried round the world without trouble, fatigue, noise, dust, or drains.



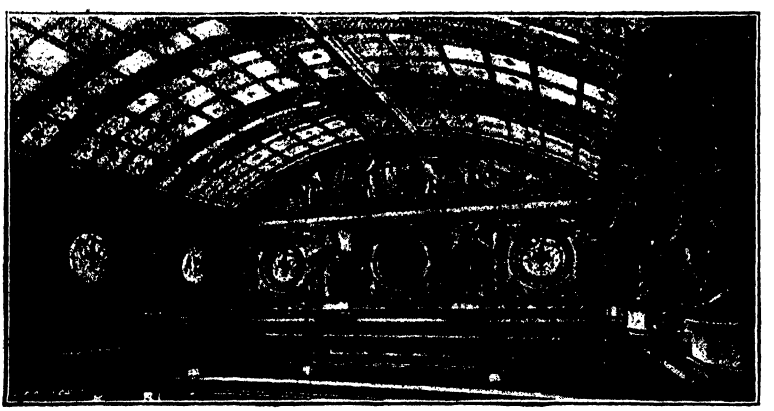
SMOKING ROOM.

As ships of the older type are very common and comparatively familiar, it may be best in this chapter to describe one of the new ships. There is something fascinating in the air of luxury, the size, nay even in the unexpectedness of everything. We think of such expressions as "cabined, cribbed, confined," but here we see nothing answering to this description, for everything is light, spacious, and airy. Vessels whose displacement at the load line is over 10,000 tons cannot look anything but large, and when we read of 6,000 tons register, and of 10,000 horse power effective, the figures convey no such distinct idea to the mind as a single glance along the promenade deck, or from the gallery into the dining saloon where more than 100 passengers, grouped perhaps in parties or families, can dine at once, and where each diner can choose his own dinner hour. This dining room is in

some of these ships made a central feature, rising with a dome through the deck. In others again, the dining room and the drawing rooms are either quite apart, or are placed on the deck one immediately above the other, with a circular railed opening between. The plan of these ships, with the passengers' living rooms forward of the engines, allows great freedom and variety. In nearly all there is a music room on the uppermost or promenade deck, and on the same deck is the smoking room. The second-class accommodation, a matter in which great improvements have been made of late years in almost all passenger ships, but notably in those of the Orient Line, consists, besides the cabins, of convenient saloons, and music and smoking rooms.

If we take the latest addition to the Orient Line, the twin screw steamer *Ophir*, as an example, we find her perhaps the largest of all the steamers which pass through the Suez Canal. She is built to rely on steam only for her propulsion. The engines, which we shall come to further on, are the most important part, but they are not what chiefly strike the passengers, under whose notice, in fact, they do not often come. The sight presented by the ship itself is such as could not have been conceived twenty years ago by the strongest imagination. The type had to be worked up to, step by step. She was built at Glasgow, and launched in April, 1891. She is of 6,910 tons register, and her displacement at the load line is 12,362 tons. Her engines develop over 10,000 horse-power. Her extreme length is 482 feet, and her breadth 53 feet 6 inches. She has a straight stem, an elliptical stern, two funnels, 100 feet apart, and two pole masts. Her cellular double bottom is divided into watertight compartments, and the whole ship is similarly divided, so that, as her builders declare, if any two adjacent compartments were, by collision or otherwise, thrown open to the sea, the *Ophir* would still preserve sufficient buoyancy to enable her to float with safety. She is propelled by twin screws, driven by separate sets of engines, each set in a separate watertight compartment. The ship is, in fact, a huge steam life-boat, and has besides a larger complement of boats than are usually carried. Rolling is checked by deep bilge keels. The *Ophir* has in all no fewer than six decks. We need only notice those on which the saloons and sleeping apartments are situated. In the decorations of the principal saloons, as well as in so many other respects, the *Ophir* claims to have advanced upon most steamers afloat, though other ships of the Line are not far behind in the taste and refinement of their fittings. The great dining saloon may be described as a banqueting hall. It is an apartment so lofty that it gives us no impression of being on board ship. The central part, supported on walnut columns and corbels, carved and gilded, rises through the promenade deck above. It has an arched glazed ceiling, divided into

panels with yellow stain patterns. This inner ceiling is protected by an outer casing, the space between being utilized for electric lamps, which give a softened light through the tinted glass. Round this dome are placed ten statues of female figures, all different, but all works of art, in an Early French style, and recalling the time of Francis I. From them are suspended additional lights. Between the statues are circular windows ornamented with carved festoons of flowers. At one end is a shield bearing the arms of the four chief Australian colonies, accompanied by similar figures representing the sources of their wealth. All the sculpture is in solid wood, not plaster. The robes of the figures are gilt in different shades of fine gold; but the statues are painted in ivory colour, such as was used by the Greeks. The lower part of the saloon is panelled in satin and rosewoods, and there is a band



DOME OF SALOON, S.S. "OPHIR."

of gilded carving under the cornice. The general effect is light and cheerful. Though many hands have been employed—Cambi of Sienna, Aumonier of London, Pomeroy and Frith for the figure-carvings from Glasgow—the result is harmonious. All has been executed under the superintendence of Mr. J. J. Stevenson.

In the drawing room the panels round the walls are inlaid rosewood or satin-wood. The designs are executed by Messrs. Knox and Webb, but the chief decoration consists of eight paintings of English scenes by Mr. Napier Hemy. There are also eight smaller figure paintings of the Seasons by Mr. Walter Crane. The smoking room is simply and comfortably furnished. It is panelled in oak and upholstered in stamped green leather. In the decorations of this and the other ships,

use has been made of heraldry. A buffet in one ship—which, in fact, masks a staircase at the end of the dining saloon, is carved with the Royal arms, coloured and gilt. In other places appear the arms of the different colonies, and the badge or device of the Company, with a lion and kangaroo for supporters, associated with the motto—

PAR NON LEONINA SOCIETAS,*

which seems to indicate a belief that the advantages of the connection between England and Australia are and ought to be mutual, and not one-sided.

It is obvious that the engines of such a ship as this are of the greatest importance. Directly or indirectly the whole of its life, so to speak, depends on them. It is steam which drives the twin screws of the *Ophir*, which makes the ice in the refrigerating chambers, which keeps the electric light always available, and which provides ventilation.

Everybody has heard of compound engines, of high pressure engines, and of triple expansion engines, of horse power, and of boiler pressure. Speaking roughly, and avoiding technical terms, we may explain that a high pressure engine, so called, has but one cylinder. When the steam has expanded in that cylinder and completed its work, it passes into the air, as we see it issuing from the funnel of a locomotive. A compound engine has two or more cylinders, through which the steam passes in succession. Each successive cylinder is considerably larger than the one before it, the steam working by expansion in each cylinder. Steam can be raised to 150 lbs., or even 200 lbs., and can now be used efficiently in three or even four cylinders before its energy is exhausted. The compound and the triple expansion engines are economical contrivances for using to the utmost the great steam pressure which can be produced. Even then we have not done with the steam. As it cools and is condensed we apply it to a further use. After it has been utilised in the cylinders to the extent of its expansive power, it is passed into a chamber, called a condenser. The condenser is furnished with a number of copper tubes. Through these tubes cold sea water is pumped to hasten the condensation of the steam. From the chamber other pumps return the condensed water to the boilers. What with the rapid condensation of the nearly exhausted steam by the cold sea water and the action of the pumps carrying off the resultant water, a vacuum is created in the last or low pressure cylinder, which relieves the pressure on one side of the piston at the same time that the steam forces it on from the other side. Whereas but a few years

* *Leonina Societas* is a term in Roman law signifying a partnership so inequitable as to be held to be invalid.

ago the ordinary working pressure of steam at sea was 60 lbs. on the square inch, recent improvements in connection with boilers have rendered it possible to use with safety steam of a pressure as high as 200 lbs. per square inch. The pressure in the case of the *Ophir* is 160 lbs. The boiler plates are made of steel. In the larger ships there are as many as eight boilers and thirty-eight furnaces, while each boiler weighs over 85 tons.

When we have an opportunity of looking down into the engine room from the upper deck, we see only the tops of the cylinders, and, in some cases, the guide rods which move in unison with the pistons. The cranks, pistons, screw shafts, and guide rods are all made either of the finest steel, or of some more costly metal. The screws are of manganese bronze. Below these cylinders are the cranks upon which the pistons, driven up and down by steam, exert their force. Below, also, may be seen the reversing gear, and the handles by which the steam valves are controlled. By means of these handles the engines are started, stopped, or reversed. The object of all the power developed is the revolution of the screw or screws. The screw shaft runs from the engine through a long tunnel, and through a closely packed casing to the sea, where the screw propeller is attached to it. In some ships, as we have seen, the engines and the screw are duplicated, the duplication rendering it all the safer to dispense with sails, as the ship can be propelled at a good rate of speed with only one engine. The end of the shaft next to the engine is furnished with a series of large collars or rings, each of which is fitted to a corresponding ring firmly set on the engine room floor, forming what is known as the "thrust block." On the strength and firmness of this block depends the progress of the ship. The whole weight of the power exerted by the propeller is thrust against it, and through it is communicated to the ship.

We have already mentioned the electric lighting of the *Ophir*. All the ships of the Line are fitted with it, and it has been found to contribute enormously to the comfort and largely to the safety of the passengers. The small, delicate, pear-shaped lamps, known as *incandescent*, which are distributed all over the interior of the steamers, require neither trimming nor lighting; oil, wicks, smoke, and all resulting odours are therefore abolished. The present pretty illuminators are simply connected with carefully insulated wires, along which the electric current is allowed to pass to and from the dynamos.

There are two ways of producing electricity, viz., by chemical action or by mechanical action or friction: the latter is the method here used. The electric current is generated by independent machinery, fixed in the engine room, which sets in motion a dynamo electric machine, a contrivance for converting mechanical,

energy into electric energy. This electric current is worked at a very low tension—so low that its presence could scarcely be detected, even if it were possible to take hold of the bare conductors with uncovered hands. The lamp consists of a fine thread of carbon enclosed in a glass bulb, from which air has been totally excluded. This thread of carbon offers a very high resistance to the current passing through it; the result being that the energy is expended in raising the thread of carbon to a white heat. The permanence of the carbon is dependent on the total absence of oxygen; should the glass bulb be broken oxygen is, of course, admitted, and the carbon thread is immediately destroyed by combustion. All the lamps are arranged so that they can, either singly or in groups, be turned off and on at will, by means of switches. The electric light is, if properly fitted, the safest from every point of view for a passenger steamship. The total absence of smell or smoke, the steadiness, unaffected by the motion of the ship, combined with superior brilliancy, give to the electric light a special value over any other means of illumination.

The principle on which the freezing chamber is contrived is one of the most curious examples of the application of a scientific theory to a practical purpose. To endeavour to explain it in unscientific language, let us state what has long been known, that a certain quantity of heat, a quantity perhaps not to be felt, is in all air. This heat keeps the air at a certain bulk, and the more heat there is the more the air expands. This is, of course, within the experience of every one. To make use of the fact for refrigerating purposes, air is pumped into a chamber, and there compressed. The temperature of the compressed air rises, for the reason that there is the same number of units of heat in a smaller space. This increase of temperature is got rid of by circulating cold water through it; the water of the sea, even in the tropics, is cold by comparison; and the compressed air parts with its heat to the water. It is then liberated, but to attain its ordinary volume or bulk it must have back the heat it has parted with to the water. It tries to get heat from everything it comes in contact with. Any particles of moisture it encounters fall in snow. Fish, flesh, fowl, etc., exposed to it lose any heat they contain, and rapidly become frozen. This is the principle of the refrigerator, and its application, with the help of an engine to compress the air and work the circulating pump, is merely a matter of detail.

Before the air is in a suitable condition to be discharged from the machine into the chambers, it has its heat subtracted from it during four successive stages. In the first of these it is drawn from the atmosphere into the compressing cylinders, where it is compressed to one-fiftieth of its original volume, being at the same time cooled by jets of water playing into the cylinders. At this pressure it is led to a water tower, where it is mixed with water from a spray, which further reduces it in

temperature, after which the moisture which it has acquired is taken from it in a series of drying pipes, surrounded by air returning from the chambers. The compressed air thus cooled and free from moisture, goes then to the expansion cylinders, where it gives out during expansion part of the work expended in compressing it, thus helping to drive the machine. It is then in a condition to enter the storage chambers entirely free from moisture, and at a temperature of about 80 degrees below zero, Fahr., or say 112 degrees of frost.

In addition to the engines used for propelling the ship, for supplying light, and preserving food, hydraulic machinery is resorted to for several purposes, among which, in many large steamers, it facilitates the movements of the steering gear. A small tiller, instead of a wheel, is now frequently found on the bridge, and from the delicacy of its mechanism, and the readiness with which it answers to the lightest touch, it greatly lessens the labours of the steersman, and at the same time increases the rapidity with which his touch becomes effective.

The most important thing in the steering of a ship is the careful observation of the Mariners' Compass. This marvellous invention is the mainstay of every one who seeks to cross the sea, or to venture out of sight of land in any direction. The best practical treatise on the subject of its use is probably that contributed by Captain W. Mayes, R.N., to *Raper's Practice of Navigation*, published by Messrs. Potter, of the Poultry, who kindly permit us to extract a few notes. The whole subject is too large and too important to be treated of here, but we may endeavour to define what a compass is, and why it forms an integral part and indispensable feature of a ship.

The Compass was well defined by John Davis the Navigator, in 1607, as "a principal instrument in navigation, representing and distinguishing the horizon." The use of iron in modern ship building, by its natural effect on the compass, having greatly increased the difficulties of navigation, it has been thought necessary to make considerable additions to former notes on this important instrument, and give our friend, the "Intelligent Passenger," some idea of the methods by which the sailor battles with, and strives to counteract, the mischief caused by the natural action of the iron body of the ship upon her heart, the Compass.

The pointing or directive property of the magnet, on which the efficiency of the compass mainly depends, was recognised in Asia long before Europeans were aware of its value. The magnet appears to have been known to the Chinese, who called it *tchu-chy*, the directing stone, and made use of it in travelling by land and sea, as far back as 2600 B.C. The ancient Greeks and Romans, though familiar with the

magnet, were not apparently aware of its directive property, nor were their descendants till the beginning of the thirteenth century. About that time the seamen of the Mediterranean gradually became acquainted with the fact, that a piece of magnetised steel shaped like and commonly called a needle, would, if allowed to turn freely about its centre, always come to rest in the same direction, and that, by reference to its pointing, they could roughly check or direct the course of the vessel.

Thus, before the seamen of those days were two problems. First, the best means of giving to the needle freedom, to take up any horizontal direction, and of indicating the direction of the ship's head relative thereto. Second, to find the direction of the pointing of the needle, in relation to some known standard of direction. In other words, first the perfecting of the mariner's compass; second, a knowledge of what is now called its variation.

Apparently, the earliest means used by the Arabian sailors to allow the needle to take up any position in azimuth, was by thrusting it through a piece of light wood or pith, forming with it a rectangular cross, the wood or pith being just sufficiently large to float the needle, when the cross was placed in a vessel of water. Otherwise, the needle was poised at its centre on a sharp pivot, and enclosed in some form of box. Subsequently, the necessity for keeping the box horizontal, in the varying motion of the ship, was met by gimballing the compass-box, and, for convenience, a circular disc of paper, called the fly, having a graduated circumference, was placed on the needle. The fly and the needle together was called the card. The box was generally made of brass, shaped like a basin, and had a glass cover. A mark, called the lubber-line, was placed on the fore part of the compass-box, or bowl as it was commonly called, on the inside, indicating the direction of the ship's fore-and-aft line, from the centre of the card.

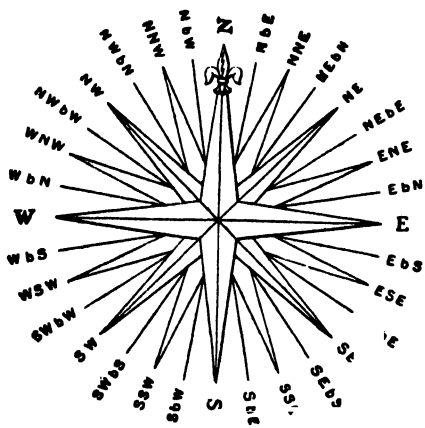
The *binnacle* is the case or box which contains the compass; it is glazed and furnished with suitable lamps to illuminate the compass at night.

The circumference of the card represents the horizon, and is first divided into four quadrants by two diameters perpendicular to each other; the ends of these diameters forming the four principal points, or as they are called the *cardinal points*, are North, South, East, and West; and are written by their initials, N., S., E., and W. Each of the four quadrants is divided into eight equal spaces, and the points dividing these spaces are called "points of the compass"; accordingly, there are thirty-two points of the compass. The compass is also divided into 360 degrees, each quadrant containing 90 degrees. The points are named by combinations of the four letters, N., S., E., and W. The quadrants which lie between the several pairs of the cardinal points are next equally divided, and the points so obtained defined as N.E., S.E.,

S.W., and N.W.; the two letters between which each point falls. These eight spaces are again equally divided, and the points so obtained named by the three letters between which the point falls, taking care always to place the *single* letter before the *two* letters, as N.N.E., E.N.E., E.S.E., S.S.E., etc. To form the remaining sixteen points divide equally the sixteen spaces. In naming these new points, the word "by," abbreviated (b) is used, and means "one point towards." It is always *followed* by *one* of the letters of the four cardinal points, N., S., E., W., and never by a *double* letter as S.E., etc.

Repeating the points in any order is called *boxing the compass.* To do this is, of course, one of the first things a seaman has to learn.

In the early part of the present century, when ships and instruments for navigation were rapidly improving, the compass was still a rude instrument, and not abreast of the requirements of the seaman. In 1820 Mr. Barlow reported to the Admiralty, that half the compasses he had at their request examined, belonging to the Royal Navy, were useless. It is probable that the compasses of the Mercantile Navy were no better. In 1837 their Lordships appointed a committee to inquire into the matter, and, if possible, to find a remedy for an evil so pregnant, as they said, with mischief. This step was taken for the benefit of the Royal Navy, and the improvement which took place, both in the design and the workmanship of the compass, in consequence of the recommendations of the Admiralty Compass Committee, was of immediate and lasting benefit to the public service and to the Mercantile Navy.



A great difficulty to be overcome, in a compass intended to be used on board ship, is the disturbance of the card caused by the motion of the ship. The Admiralty Compass Committee, while insisting on extreme lightness in the fly and fittings of the card, made considerable addition to its weight, by applying more needle power than would otherwise have been desirable, in order to secure steadiness. This was a fairly successful way of meeting the motion of ships at that date. But the violent and continuous motion subsequently caused by the general adoption of the screw propeller, has been generally met by suspending the compass bowl by springs or india-rubber.

The difficulty of getting a compass that would be steady in small vessels and boats, led to the introduction of the Liquid Compass; that is, a compass having the bowl filled with liquid instead of air. The first practical liquid compass was patented by Mr. Crowe in 1813. It was subsequently improved by other makers, and is now, when well made, a very efficient compass for most purposes. The Liquid Compass is especially adapted to stand severe vibrations, and the shock of gun-firing. For these purposes, and for use in boats, it has not yet been excelled.

There is, however, one cause of disturbance of the needle which should interest the navigator. Humboldt, in the beginning of this century, observed that the needle, in certain places on land, was deflected from what may be called its normal direction, by some property in the ground.* It is probable, from the practice of steering by the land when it is in sight, rather than by compass courses, that this disturbance of the compass needle has escaped notice in some places where it exists. It is, therefore, desirable that this unquestionable source of danger should be pointed out, that the seaman may be on his guard, when navigating near the land, or in shallow water, especially in volcanic regions.

From the earliest times it was known that if a magnet, or a piece of ordinary iron, were brought near to a compass, it would deflect the needle in its pointing, and so make the compass indications erroneous. Compasses on board ship, therefore, were not placed near to each other, and iron was rigorously kept away from their vicinity. With these precautions, though accidents sometimes happened from iron in the vicinity of the compass being overlooked, ships were navigated with a fair amount of security. But as iron became increasingly used in the construction of ships, and by the introduction therein of steam engines, with their boilers and funnels, it was no longer possible to navigate, without systematically allowing for the deflection of the compass needle caused thereby.

The horizontal angle in which the needle is deflected by the iron in or of the ship, is called the Deviation of the Compass. It is named easterly or positive (E. or +), when the north end of the needle is deflected to the eastward; and westerly or negative (W. or −), when deflected to the westward. The mode of ascertaining and applying the deviation of the compass is the problem that seriously engages the attention of the student of navigation.

Turning a ship round, so as to place her head on all points of the compass in

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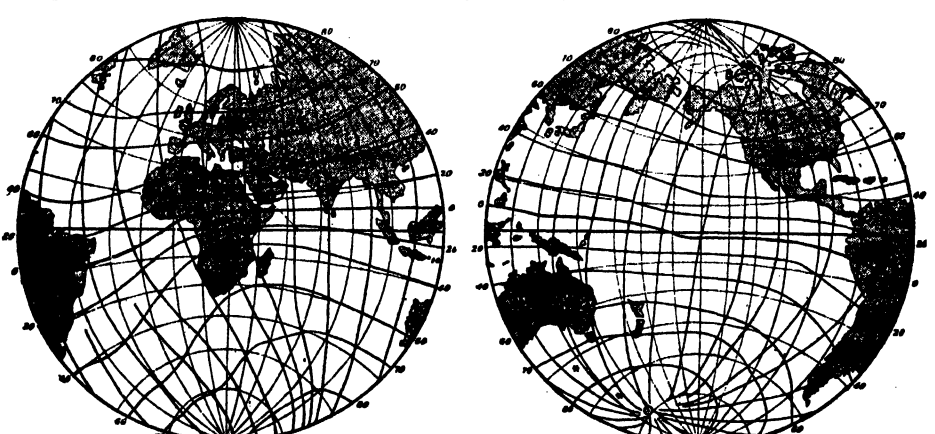
* Commander W. U. Moore, of H.M.S. *Penguin*, reports a large local disturbance of the needle (55°) in nine fathoms, two miles from the shore, off Port Walcott, on the N.W. coast of Australia.

succession, for the purpose of ascertaining the deviation, is called *swinging the ship*. A ship may be warped or towed round, when lying at anchor or at moorings; or advantage may be taken of her turning with the tide. Wherever there is room, it may be convenient to steer a ship round under steam. It is in all cases desirable that the ship should be checked in her swinging, and steadied on the point on which it is desired to obtain the deviation.

As the variation of the compass is determined by comparing the true bearing of an object with its magnetic bearing, so the deviation of the compass is ascertained by comparing the magnetic bearing with the compass bearing—the compass, at the time, being deflected by the iron in and of the ship only. Any other disturbance, such as from the proximity of other ships or masses of iron, or the irregular influence of the land, is not deviation according to the definition already given.

In the year 1576, Robert Norman, a mathematical instrument maker, of London, discovered that a needle, however nicely balanced, would, after being magnetised, depart from the horizontal, and assume a position within 20° of vertical. By careful observations he found that the needle in London, at that date, pointed, with

Hemisphere from 60° *W. to* 120° *E. Longitude.* | *Hemisphere from* 120° *E. to* 60° *W. Longitude.*



Maps showing the *Magnetic Equator*, lines of *Equal Dip*, and *Horizontal Direction* of the *Compass Needle*. The parallels of latitude and the meridians are drawn at every fifteen degrees of latitude and longitude; the figures at the circumference denote the dip in degrees along the respective magnetic parallels; and the direction of the magnetic meridians, compared with the direction of the geographical meridians, shows the variation.

The points (⊖) to which the magnetic meridians converge are the magnetic poles, sometimes called, from the dip thereat being 90°, the poles of Verticity. The points (°) show the approximate position of the foci of maximum force. It is remarkable that these six points are within 160° of longitude.

its north end downwards, 71° 50′ from the horizontal. Since that time, observations have been made nearly all over the world. It is found that the needle is horizontal only on a line round the earth, not far from the equator. Going from this line to the northward, the needle points with its north end downwards; and going to the southward, with its south end downwards. The angle of inclination in both cases increases, till in a position in each hemisphere, about 18° from the earth's poles, the needle becomes vertical. These positions are called *The Magnetic Poles.*

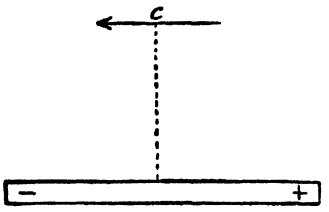
This angle of inclination to the horizontal is called the dip. It is named positive, or +, when the end towards the north magnetic pole is the lower, and negative, or −, when the end towards the south magnetic pole is the lower. Like the variation, the dip is found to change with time, and other circumstances.

In the maps on the opposite page, lines of equal dip are drawn. The line whereon the dip = 0, is called the magnetic equator; and the lines of equal dip may be considered as parallels of magnetic latitude. The lines running nearly north and south show the horizontal direction the needle lies in, and may be considered as magnetic meridians. These lines converge to the magnetic pole in each hemisphere. For the use of seamen, there is no better way of giving the variation of the compass than by lines of equal variation, as drawn on the Admiralty variation chart, No. 2,598; but the lines here shown give a more direct representation of the compass needle.

In the beginning of the present century it became known, chiefly through the researches of Humboldt, that the strength, or force, with which the needle points is not the same in all parts of the earth. It may be stated, generally, that this force is least about the equator, and, like the dip, increases towards the poles. Also, like the variation and dip, it is not constant in value at the same place.

Professor Barlow was the first to deal practically with compass adjustment, and the problem was subsequently solved by Professor Airy in 1839. That gentleman gave the results of his researches and experiments in the following words: "By placing a magnet so that its action will take place in a direction opposite to that which the investigations show to be the direction of the ship's independent magnetic action, and at such a distance that its effect is equal to that of the ship's independent magnetism, and by counteracting the effect of the induced magnetism by means of the induced magnetism of another mass [according to rules which are given], the compass may be made to point as if it were free from disturbance." Briefly, this statement is to the effect that the permanent magnetism of the ship may be counteracted by the permanent magnetism of steel magnets, and the transient magnetism of the ship by the transient magnetism of iron; the magnets and iron being placed near the compass, according to definite rules.

If a magnet be placed near a compass, so that the centre of the needle is in the same plane as the magnet, and on a line drawn from the middle of the magnet, perpendicular to its direction, the effect of the magnet is to cause a force parallel to itself, pushing the north end of the needle away from the positive end of the magnet. In the figure, if *c* be the centre of the compass needle, the arrow shows the direction of the force on its north end. This is sometimes called the *broadside* position of the magnet.



Magnets used for compass adjustment are made of hard steel, and well magnetised. Their magnetism may be considered as permanent. Thus, by means of a magnet, a permanent magnetic force can be produced, pushing the north end of the compass needle in any desired direction.

The iron used in adjusting compasses should be soft malleable iron, so that the magnetism is readily induced therein by the earth's force, and readily parted with; that is, it does not become permanent.

It is used for two purposes. For one purpose, it is in the form of an upright bar, placed, generally, before or abaft the compass. For another purpose, masses of chain or scrap iron in boxes, cylinders, or spheres, are used. These are placed beside the compass, on the same level as the needle.

The above notes, necessarily much compressed, will show the remark of John Davis in 1607, in his *Seaman's Secrets* that the sailor should have *a carefull regarde vnto his stereag with very dilligent examination of the truth of his compasse, that it be without variation or other impediments*, stands good in 1894. In the steamers of the Orient Line the error of the standard compass is determined whenever the weather permits, and is duly recorded in a compass log for reference. As an undiscovered error of a quarter of a point (or about 3°) in the compass would, in a distance of 100 miles, place the ship five miles right or left of her intended destination, the necessity for this continuous watch is readily seen.

The Log may first be considered as the instrument by which the apparent distance sailed over in a given time is determined on board ship. The common log consists of a *log-chip* or *log-ship* (often exclusively called the log) and the *log-line*. The log-ship is a thin wooden quadrant of about six inches radius, loaded with lead sufficient to make it float upright; the log-line is the line attached to the log-ship; this line is divided, and marked in equal spaces, known as *knots* and *half-knots*. When used, the log, and some portion of the line known as the *stray-line*, is thrown

over the stern, the log soon losing the impetus of the vessel, remains stationary in the water, and the line is permitted to run out freely as the ship steams onward, for an interval of time marked by a sand-glass known as the *log-glass*. The sand having run out, the line is stopped, and the length that has run out is the distance the vessel has travelled in the time shown by the sand-glass. As the knots and half-knots on the log-line are so placed that the length between each mark bears the same proportion to a nautical mile, as the time measured by the log-glass does to an hour no calculation is necessary, the number of knots run out representing the number of miles per hour at which the vessel is then travelling. The patent log is a piece of modern mechanism, that measures automatically the distance a ship travels at sea; a fan that revolves a certain number of times in passing through a certain distance in the water, is attached to a box in which, by means of wheel work, these rotations are registered upon dials.

The term "Log" is also applied to the *Log-book*, or the official daily record of the ship's proceedings. The number of knots steamed, together with the *course*, *i.e.*, the direction in which the ship has been steered as shown by the compass, is entered every hour in the log-book in columns ruled for the purpose. The direction and strength of the wind, the height of the barometer, state of thermometer, the state of the weather, the bearing of any land that may be in sight, the soundings that may be obtained, the vessel's position every day at noon, anything in fact that relates to the navigation of the vessel, is religiously entered in the "Log."

CHAPTER XII.

SEAMANSHIP AND NAVIGATION.

SAILS.—ROPES.—KNOTS.—STEERING.—LATITUDE.—LONGITUDE.—CHARTS.—THE COMPASS.—THE LOG.—CHRONOMETERS.—THE LEAD.—WEATHER AT SEA.—CLOUDS.—THE BAROMETER.—THE THERMOMETER.—THE HYGROMETER.—WINDS.

THE average landsman regards as convertible the two terms, Navigation and Seamanship, and yet there is all the difference in the world between their signification. Navigation tells us where we are, and in which direction to go to get to somewhere else. It is the scientific art by which the vessel's past course is known, present position determined, and future course shaped by the principles of geometry and astronomy upon the surface of the earth, with the assistance of the chart. Seamanship is the art of first preparing the ship and then conducting her in the direction shown by navigation, by the proper management of rudder, engines, and sails; or what is well termed "handling" ship and boats under all circumstances which may arise.

The term "aft" means towards the stern; "forward," towards the bow; and port and starboard side mean respectively the left and the right hand sides of the ship looking forward. The weather side is that side of the ship that is towards the existing wind, the lee side being naturally the other side of the ship; *e.g.*, if a vessel has the wind on the port side, that side will be the weather, and the starboard will be the lee side. If the wind is strong, the "weather" is necessarily the high, and the "lee" the low side of the ship. Poops, or raised quarter-decks aft, have practically disappeared in modern mail steamers, being replaced by the promenade deck which extends nearly the whole length of the ship. The officers now pace the navigation bridge (above the promenade deck), instead of the quarter-deck as of old. *On deck* and *below* become the substitutes

of upstairs and downstairs; and the light is admitted below by skylights, ports, and scuttles, the two last being situated in the ship's sides.

A ship is said to be on the "Starboard tack" if the wind blows upon her starboard side, or on the "Port tack" if the wind blows on her port side. The "scuppers," or deck gutters, on the lee side become receptacles for all that is dropped or upset, animate or inanimate.

A word or two may be well on the *motions* of the ship, such as "rolling," "pitching," and "scending." *Rolling* occurs when the two sides of the ship play see-saw; steamers roll more than sailing vessels, for sails are a great steadying power. *Pitching* is the plunging of a ship's head in a seaway, when the two ends of the vessel play see-saw. *Scending* is a modification of pitching, and occurs when the vessel is bodily taken up by a huge "sea," which carries or "scends" the vessel along down its declivity with a sort of cornerwise motion which gives the idea of great speed. It is obvious that pitching and scending diminish in intensity with the size of the vessel, and on large steamers are comparatively little felt, even in heavy gales.

It is, perhaps, hardly necessary to say much of the sails on a steamer, save to explain briefly the chief terms applicable to them. Of sails there are two main classes, the "square" and the "fore and aft" sails. The square are those that are stretched on yards that are placed across the masts. They take their names from the mast they are on and their height from the deck combined. The lowest are the "courses," the next above, "top-sails," and above them "top-gallant-sails," and so to "royals" and "sky-sails," with the prefix of fore, main, or mizen, according to the mast they are on. A three-masted vessel, with square sails on all three masts, is technically known as "ship-rigged"; if only on two of the three she is "barque-rigged"; if only on the foremast she is "schooner-rigged"; while, if there be square sails on the foremast, with only a square top-sail on the mainmast, she is a "barquentine." Then if she have only two masts she is "brig-rigged" if there be square sails on both, and "brigantine" if these exist only on the foremast, and a "topsail schooner" if there be a topsail on the foremast. These technical names belong to all vessels, whether steamers or not, because all vessels are described by their rig. Many vessels, however, only carry "fore and aft" sails, or sails attached up and down the mast, and spread in a fore and aft direction. Such a vessel with three masts is a "three-masted schooner," with two, a "schooner," or a "yawl." If with only one mast she is a "cutter," if there be two "head" sails, or sails before the mast; and a "sloop" if there be only one of these sails. The Lateen rig, so often

seen in the Mediterranean, is formed by a stumpy mast bearing forward and supporting a yard of enormous length with a triangular sail. It is a picturesque rig, but not good in stormy latitudes.

Some of the Orient steamers have four masts, the aftermost of which is called the "jigger mast."

Every rope in a ship is named. The sails are hoisted and lowered by "halyards"; they are spread out by ropes termed "tacks and sheets"; they are gathered in by "clew lines," "bunt lines," and "leach lines," ropes fastened to the lower corners, bottoms, and sides of the sails. Sail is "made and taken in" by hauling upon these various "lines" or ropes. It is then, if need be, "furled" or "stowed" by being rolled up neatly and closely, and bound by "gaskets" or ties. "Shortening sail" is the reduction of the area exposed to the wind. This is done by "clewing up," "furling," or "stowing" some of the sails, and by "reefing" or lessening the size of others; an operation performed by rolling or folding up part of the sail, and keeping it so by means of "reef points," short ropes fixed to the sail for the purpose. "Trimming sail" is keeping the plane of the sails at the requisite angle to the wind. This is accomplished with the square sails by the means of "braces" or ropes from the ends of the yards to the ship's side; and with fore and aft sails by the aid of the "sheets" that connect either the "boom" or the lower corner of the sail with the deck.

It is obvious that as nearly all the ropes lead to the deck the seaman should have a familiar knowledge of the exact position of each rope, without being obliged to look aloft and trace the particular rope to its "belaying-pin" or fastening place on deck, for usually there is no time to trace it, and more often than not he has to work in the dark night; the whole arrangement is, however, simple; and a landsman may by watching easily "know the ropes," *i.e.*, learn the name and use of every rope fastened to the deck without the need of a glance aloft.

We have mentioned already the little tiller, with its hydraulic gear. The rudder itself is "hung" or hinged upon the sternpost, and its "head" penetrates through the decks to where the "tiller" or "helm" can be conveniently attached as a handle to turn the rudder. When a vessel moves swiftly through the water great pressure bears upon the rudder, therefore mechanical appliances must be adopted to move it with the required ease. But by the aid of steam, or hydraulic machinery, the largest ships can be steered by one man.

It is necessary to remember that the terms applied to steering are used as though the helm or tiller itself were worked without the aid of machinery. Indeed, by the words starboard and larboard, we are carried back to the old Norse days when the

steering was done by a large oar, and the "helm's-man" stood on a raised platform, on the right-hand side of the ship, hence the term "starboard," standing or steering side, from *steoran* to steer, and *bord*, a plank or border. "Larboard" may come from *lar*, a contraction of lower, *i.e.*, humbler in rank, not on the steering side; whence in French it is called *bâbord*, from *bas*, low. As the two words are similar in sound, but directly opposite in meaning, it is not surprising that this was found confusing. It was not, however, till the year 1845 that the English Admiralty took the lead in disestablishing "larboard" altogether, and setting up "port" in its stead. The French authorities followed suit in 1881, and issued an order that *bord-tri* and *bord-bas* should be substituted for *tribord* and *bâbord*. When the steersman receives the order "Port," he pushes the tiller towards the port, or left-hand side of the ship and so causes the head of the ship to move to starboard, or towards the right. If the order be "Starboard," the tiller is pushed towards the starboard, or right-hand side of the ship and her head turns to port or to the left.

Port and starboard are the usual terms in steering, but we also hear of "up with the helm," "down with the helm," and "steady." When the wind blows strongly against the side of a ship it makes her heel over, so that one side is higher above the water than the other. To put the helm "up" is to thrust the tiller "up hill," or to the weather side of the ship, and to put the helm "down" is to thrust the tiller "down hill," or to the lee side; to "steady" the helm is to bring it again to the middle of the vessel, and so relieve the vessel of the effect of the action of the rudder. When the tiller or helm is as far over to one side or the other as it can go, it is said to be "hard over," "hard-a-port," or "hard-a-starboard," or "hard-a-weather," and "hard-a-lee," as the case may be. By putting the helm "down," the vessel's head is brought up towards the wind or "luffed," while by putting the helm "up," the vessel is made to "bear up," or "pay off," from the wind.

It is evident that something may happen to the tiller or rudder-head, and so render the rudder uncontrollable. It is therefore usual to fasten to the after-part of the rudder itself two chains, by which, should need arise, the rudder could be moved in the absence of the tiller. Moreover, in the event of accident to the rudder, it is possible to rig a substitute. A spar is towed astern. From the farther end of this spar lines are led to both sides of the ship's stern. She may then be steered by pulling on either line, as requisite.

In steering with a wheel the mechanism is generally so arranged that the spokes of the wheel must be pulled down towards the side to which it is wished to turn the head of the vessel. In good steering the helm is altered frequently, but very little each time, the good steersman being always on the watch, noticing every little

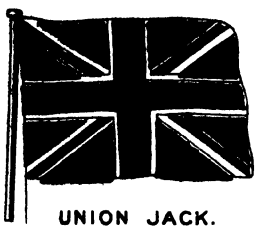
tendency to deviate from the course, and at once endeavouring to check the same, by a quick but small action of the helm. The reader will not forget that the rudder is there to govern the direction in which the ship *goes;* and that it is powerless unless the ship be moving through the water, or the water moving past the ship. Some people have an idea the rudder can turn a ship at any time; and in boats one frequently sees the uninitiated working the tiller when the boat is lying in still water. Finally, it must be remembered that, in turning, a ship does not pivot on her stern post, but somewhere nearer her head. Her stern, where the controlling power is, naturally moves her bow.

We will next consider the steamer's anchors. Sea-going vessels, as a rule, have five anchors ready for use. The "stream" anchor is for light work and emergencies. The "kedge" is still lighter than the stream, and is used for warping, etc. The "sheet" anchor is a spare anchor, for times of special urgency or danger. The remaining two are the working or "bower" anchors, which are kept at the bows of the ship, ready for immediate use; attached to the bower anchors are the cables, which pass out from the lockers in which they are stowed, through the "hawse-holes" in the bow of the ship, and are shackled on to the bower anchors. Cables, at one time made of hemp, are now made of chain; the weight of this chain in the water gives to the cable a certain elasticity proportionate to the length used.

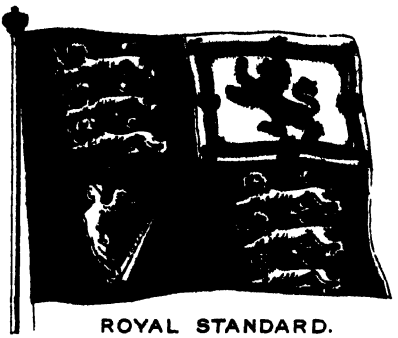
The anchors at sea are "stowed" or carried securely lashed on the bows till the time approaches when they are likely to be wanted. The cables are then "bent" or shackled to the anchors. The anchors are next "unstowed," and hung out over the side from the projecting "catheads," from which they are "let-go" at the right moment. The requisite amount having been allowed to run out, the cable is then fastened securely, or "bitted and stoppered," on board.

When the vessel is to be got under way, the cable is wound in by means of a capstan worked by steam, until the anchor be right under the vessel's forefoot, and may be easily broken out of the ground. The anchor is now said to be "apeak." Then comes the order, "start the anchor," when the anchor is broken out of the ground, and wound up out of the water; the anchor is next brought to its place at the bow by means of large tackles called the "cat and fish."

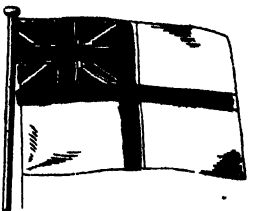
The term "moored" applies when two anchors are used at the same time, or when the vessel is "made fast" to buoys or anchors permanently fixed in the harbour. The passenger who wishes to study mooring as a science will probably have an opportunity in the Suez Canal, where "tying up" is sometimes performed with marvellous celerity. It is the same with the delicate operation of "letting go."



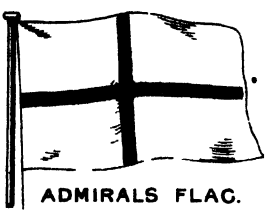
UNION JACK.



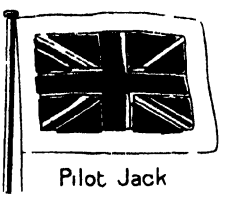
ROYAL STANDARD.



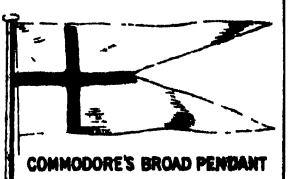
WHITE ENSIGN.



ADMIRALS FLAG.



Pilot Jack

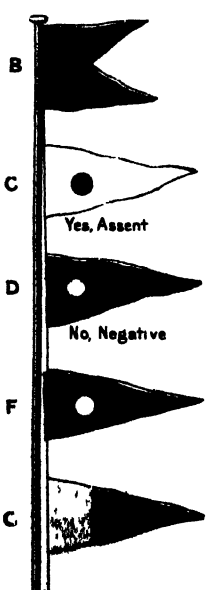


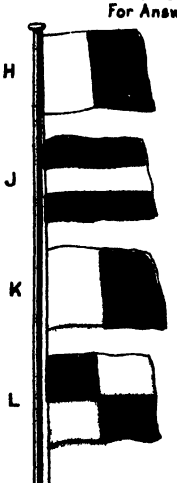
COMMODORE'S BROAD PENDANT

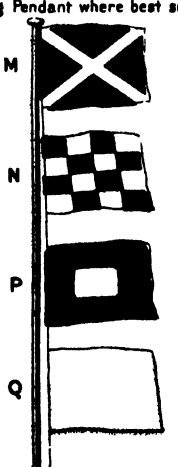
INTERNATIONAL CODE.

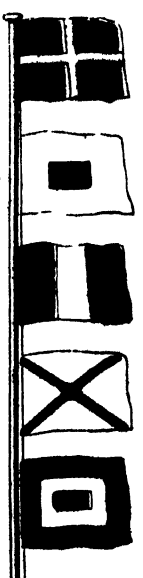


Code Signal & Answering Pend^{t}
When used as 'Code Signal' to be hoisted under the Ensign
For Answering Pendant where best seen









To prevent collisions legislation has established the well-known "Rule of the road at sea." And it proves how good the rules are that considering the large number of vessels traversing narrow seas in every direction night and day collisions are so few and far between. There are two classes of vessels moving across the sea; steamers and sailing vessels; and the cardinal rule of the road is that steamers keep out of the way of sailing vessels, no matter how they are meeting or coming near each other.

There are three ways by which vessels approaching each other at sea may come into collision—viz., by meeting "end on," by crossing, and by overtaking.

1. Vessels *meeting "end on"* pass to the right of each other; go to starboard or to the right, by "porting" the helm; doing exactly the opposite to what a driver in a London street would do.

2. Vessels *crossing each other* require more complex rules. If they are both steamers, that one which has the other on its right hand or starboard side *must keep out of the way*. If they are both sailing vessels and both "close hauled," *i.e.*, beating to windward, then the one with the wind on her left side, that is the one on "the port tack," must keep out of the way of the other on "the starboard tack." But if one sailing vessel is "going free" and the other is "close hauled," the one "going free" must keep out of the way.

3. With vessels *overtaking* one another, the overtaking vessel has to keep clear of the other; but the overtaken ship must show from her stern a white light, or a flare-up light.

A steamship under way may indicate the course she may be steering to any other ship which she has in sight by the following signals on her steam whistle, viz.:—

One short blast to mean, "I am directing my course to starboard."
Two short blasts to mean, "I am directing my course to port."
Three short blasts to mean, "I am going full speed astern."

The use of these signals is optional, but if they are used the course of the ship must be in accordance with the signal made.

On each bow of a ship when under way is carried a bright light, showing the light on its side of the bow only, and round an arc of a little more than a right angle, 112°. The light on the starboard bow is green; that on the port bow is red. (These colours may be remembered by the fact that the light on the *port* side is the same colour as *port wine*.) Steamers, *in addition*, carry a bright white light at their masthead; and steamers towing other vessels carry two white lights at the masthead.

On a ship, whether a steamship or a sailing ship, when at anchor, is carried where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a globular lantern of not less than eight inches in diameter, and so constructed as to show a clear, uniform, and unbroken light, visible all round the horizon, at a distance of at least one mile.

1. In regard to vessels *meeting end on*, we have such rules as the following, known to all sailors:—

"Green to green, or red to red,
Perfect safety, go ahead."

Or again:—

"When *both* side lights you see ahead,
Port your helm, and show your red."

2. In the case of *vessels crossing* we have a fertile cause of collisions, by reason of the fact that in too many cases they follow the rule which *only applies to vessels meeting end on.* Hence it is said that *the reckless use of Port Helm leads to collision.* There is a short rule for vessels crossing:—

"If to your starboard red appear,
It is your duty to keep clear;
With green to port you've naught to do,
For green to port keeps clear of you."

3. In regard to "overtaking vessels," the overtaken ship (inasmuch as she can see the bow lights of the overtaking vessel, whereas the overtaking vessel may see nothing of her) must take care to let the other vessel know that she is to keep out of the way, by showing a white light or burning a flare-up over the stern.

Navigation, or the art of Piloting, was divided by the early mariners into two parts: common and proper. Common Piloting is that knowledge which teaches how to coast along shore, or to sail or steam within sight of land. Proper piloting is that knowledge which teaches how to sail or steam across the ocean out of sight of land, and to navigate by aid of celestial instead of by terrestrial bodies.

On the Orient steamers, passengers will notice with what perpetual care and watchfulness the navigation is conducted. The "taking of observations" by captain and officers about the time of waiting for the breakfast bell, and at noon-day; the frequent manipulation of the azimuth compass that stands conspicuous on the navigating bridge, are every day operations of which the observant passenger will inevitably desire some intelligible explanation. An acquaintance with the first principles of navigation can be acquired by a little application during the voyage; such knowledge may prove of practical value to men with exploring or travelling duties before them.

The Navigator is always required to know his position on the surface of the globe, or the latitude and longitude in which the ship under his care may be situated.

The local pilot having left the ship, the navigator's first care is to take a departure, that is, to carefully fix the vessel's position on the chart by means of taking cross bearings (see page 212) of two or more known and conspicuous objects upon the land still in sight. This forms the initial position for the voyage. From the latitude and longitude thus obtained, the first course is shaped, and first distance reckoned. By taking a careful *departure* at the beginning, the sailor gives fair promise of making a good *landfall* at the end of the voyage. It may be here necessary to call the reader's attention to the nature of the sphere, and to a few of the definitions in spherical geometry that will aid him in comprehending the first principles of navigation.

A Sphere is a solid described by the revolution of a semi-circle about its diameter, that diameter being immovable during the motion of the semi-circle. This diameter is called the axis of the sphere, and its extremities the poles. The Centre, Axis, and Radii of a sphere are the same as the centre, axis, and radii of the generating semi-circle. Great Circles may be defined as circles marked upon the sphere by a right plane cutting a sphere through the centre, and dividing the sphere into two equal parts. Therefore all the great circles of the same sphere are equal to each other, and the centre of the sphere is the common centre of all its great circles.

Small Circles are those circles drawn upon the surface of the sphere by right planes cutting the sphere, but not passing through its centre, and therefore dividing the sphere into two unequal parts. Hence small circles, unlike great circles, are not equal to each other. Parallel Circles of the sphere, are those small circles, the planes of which are parallel to the plane of some great circle. The poles of a circle are those points upon the surface of the sphere that are equally distant from the circumference of that circle; but great circles are equally distant from *both* their poles, while small circles are unequally distant from *both* their poles. For example: all parts of that great circle, the terrestrial equator, are equally distant from both north and south poles; while all parts of the small circle, known as the parallel of London, although equidistant from the North Pole, are much nearer to that pole than they are to the South Pole. The pole of every great circle is at 90 degrees distance from it on the surface of the sphere; and no two great circles can have a common pole. A Spherical Angle is the inclination of two great circles of a sphere meeting each other. A Spherical Triangle is a figure formed on the surface of the sphere by the mutual intersections of three great circles.

HOUSE FLAGS AND FUNNELS,

CARRIED BY STEAM SHIPS BELONGING TO SOME OF THE PRINCIPAL COMPANIES OF THE BRITISH MERCANTILE MARINE.



ORIENT STEAM NAV Cº, LONDON

P & O STEAM NAV Cº LONDON

PACIFIC STEAM NAV. Cº, LIVERPOOL

BRITISH INDIA STEAM NAV Cº, LONDON

DUGAL LINE, WESTRAY & Cº, LONDON



ROYAL MAIL S PACKET Cº LONDON

INMAN & INTERNATIONAL Cº LIVERPOOL

CUNARD LINE, LIVERPOOL.

DONALD CURRIE & Cº, LONDON

GLEN LINE



GREENOCK STEAMSHIP Cº LONDON

NEW ZEALAND SHIPPING Cº, LONDON

SHAW SAVILL & ALBION Cº, LONDON

UNION S S Cº OF N Z DUNEDIN

UNION S S Cº, SOUTHAMPTON



CITY LINE, C SMITH & SONS, GLASGOW.

PACIFIC MAIL S S Cº, LONDON

A HOLT, LIVERPOOL

LAMPORT & HOLT, LIVERPOOL

WHITE STAR LINE, ISMAY, IMRIE & Cº



GUION LINE LIVERPOOL

ANCHOR LINE HENDERSON BROS GLASGOW

CLAN LINE GAYZER, IRVINE & Cº, GLASGOW

ALLAN LINE GLASGOW

ANGLO-AUSTRALASIAN STEAM NAVIGATION Cº



NATIONAL LINE, LIVERPOOL

WILSON LINE, HULL

F GREEN & Cº BLACKWALL LINE LONDON

HONEY WIGRAM & SON LONDON

MERSEY S S. Cº, LIVERPOOL



RATHBONE BROS, (STAR LINE) LIVERPOOL

MOSS S S Cº LIVERPOOL

TEMPERLEYS, CARTER & DARKE, LONDON

ATLAS LINE, LEECH, HARRISON & FORWOOD, LIVERPOOL

LUND'S LINE.

HOUSE FLAGS AND FUNNELS.

OF SOME OF THE PRINCIPAL FOREIGN STEAMSHIP COMPANIES



MESSAGERIES MARITIMES, MARSEILLES

COMPAGNIE GENERALE TRANSATLANTIQUE, PARIS

NORDDEUTSCHER LLOYD, BREMEN

RUBATTINO & Cº GENOA

ITALIAN LLOYD, GENOA



HAMBURGH AMERIKAN, PACKETFAHRT ACT GESELL. HAMBURGH.

NETHERLANDS INDIA S NAV Cº, BATAVIA.

SOC. DE NAV. ROYALE BELGE SUD AMERICAINE, ANTWERP

NETHERLANDS AMER S NAV Cº ROTTERDAM

COMPANIA TRASATLANTICA, BARCELONA.

The Shortest Distance between two points upon the surface of a sphere is the arc of a great circle passing through those points. The Earth's polar diameter being slightly (26 miles) less than its equatorial diameter the Earth is not a true sphere, but what is called an "oblate spheroid"; still for the general purposes of navigation, the Earth is treated as a sphere.

Latitude is the distance the ship may be directly north or south of the Equator, that great circle on the Earth which is equidistant from the North and South Poles. Latitude is measured on the Meridians, in degrees that are all equal to each other, and of which there are ninety between the Pole and the Equator.

Meridians are great circles passing through the North and South Poles, and cutting the Equator at right angles.

All direct distances in navigation are measured in nautical miles or knots. A nautical mile is the sixtieth part of a degree of latitude, and being 267 yards longer than the statute mile, great care must be taken not to confound the nautical mile with the statute mile, the sea mile with the shore mile. To convert knots into statute miles, multiply the number of knots by 1·15, or roughly, add one-sixth of the number of knots—six knots being equal to nearly seven statute miles.

Longitude is the distance a ship may be directly east or west of the meridian of Greenwich, or the great circle upon the earth that passes through Greenwich Observatory and the North and South Poles. Longitude is reckoned in degrees, which, unlike the degrees of latitude, are not all equal to each other, but vary in size, according to the latitude in which the longitude is reckoned. Longitude is therefore measured on the equator, being the distance on that great circle intercepted, east or west, between the meridian of Greenwich, and the meridian passing through the position of ship. The cause of this inequality in the degrees of longitude will readily be seen by looking at a terrestrial globe. On this practically true representation of the earth, it is evident, that although the degrees of latitude are all equal to each other, yet there must be a great difference, in different parts of the world, in the length of the degrees of longitude. At the equator they are certainly like those of latitude, each equal to 60 nautical miles, but through the meridians all converging towards the pole, the size of a degree of longitude varies with its distance from the equator. Its length depends, therefore, upon the latitude in which it is reckoned. For instance, a degree of longitude which at the equator is equal to 60 nautical miles, in latitude 30° is equal to 52, in latitude 60° to 30, and in latitude 80° has decreased to about 10½ nautical miles. Longitude is also measured in time, that is, in hours instead of degrees, for the following reasons:—the earth, in her motion on her axis, and in her orbit round the sun, describes, once in nearly 24 hours, a complete circle.

360 degrees. Hence the longitude of a place may be measured by the time the earth takes to revolve through the distance between the meridian of Greenwich and the meridian of that place; that is, the earth turns through 360 degrees in 24 hours, through 180 degrees in 12 hours, through 90 degrees in six hours, and through 30 degrees in two hours. A place therefore may be said to be situated in longitude 30 degrees east, or in two hours east of Greenwich. The map of the world further on in this chapter will fully illustrate the above remarks upon longitude, and the following notes upon arc and time.

In reckoning by arc or by degrees, each degree is divided into 60 minutes, and each minute into 60 seconds. In reckoning by time or by hours, each hour is similarly divided into minutes and seconds. But a distinct notation for each of these has been adopted; degrees, minutes, and seconds being represented by $^{\circ}$ $'$ $''$, and hours, minutes, and seconds by ^{h} ^{m} ^{s}; and care should be taken not to use the same marks for both, as great confusion will arise from so doing:—One minute (^{m}) of time being equal to 15 minutes ($'$) of arc. Longitude in arc and longitude in time are easily convertible, for since 360 degrees is the equivalent of 24 hours, 15 degrees is equal to 1 hour, 1 degree to 4 minutes of time, and 1 minute to 4 seconds of time; or $360^{\circ}=24^{h}$, $15^{\circ}=1^{h}$, $1^{\circ}=4^{m}$, and $1'=4^{s}$, or *vice versâ*, $24^{h}=360^{\circ}$, $1^{h}=15^{\circ}$, $1^{m}=15'$, and $1^{s}=15''$.

A chart—without which navigation would be almost impossible—is a marine map intended especially for the use of seamen. A chart is constructed for the purpose of ascertaining the position of a ship with reference to the land, and of finding the direction in which she is to steer, and the distance she has to sail or steam.

For the purposes of navigation it is necessary to exhibit the seas and oceans on flat surfaces. Charts are therefore artificial representations of portions of the earth's surface delineated upon a cylinder instead of upon a sphere. To comprehend this statement it may be necessary to remember that *a cylinder* is a solid figure described by the revolution of an oblong, or right angled parallelogram about one of its sides, which side remains fixed. The idea of representing the earth's surface upon a cylinder, conceived by Gerard Mercator, a Fleming, in 1569, and perfected by Edward Wright, an Englishman, is known as Mercator's projection, and charts constructed upon this principle are universally used, as upon such charts the track of a ship always steering the same course appears as a straight line.

On the globe the meridians all converge towards the pole, the degrees of latitude are all equal to each other, those of longitude unequal: on a Mercator's chart the meridians are drawn as parallel lines, and the degrees of longitude are all equal to

each other. To compensate for this error, the degrees of latitude on the Mercator's chart are distorted, being extended as they leave the equator beyond their true lengths, in the same proportion as the degrees of longitude on the globe diminish in size as they approach the Pole. The length of the degrees of latitude on a chart consequently increases as the latitude increases, three and a-half degrees in the latitude of 70° being equal to 10° in the neighbourhood of the equator. It is, however, only when equatorial and polar regions are thus contrasted on the same chart that the distortion is so evident; contiguous countries and seas appear but little out of their true proportion to each other, and no other projection has been discovered that so well meets the general requirements of the sailor.

In a chart, the upper part, as the spectator holds it, represents the *true* north and that towards his right hand the east; latitude is accordingly measured on the right or left sides of the chart, and longitude on the top or bottom edges. All distances must be measured upon the latitude scale, using that part of the scale which is in the same latitude as the ship; *e.g.*, distances between places in latitude 50° and 60° must be measured upon the latitude scale between 50° and 60°.

The Admiralty Charts, which number over 2,600, are published with a view of meeting the wants of the sailor in all parts of the world. They may be classed under five heads, viz.:—Ocean, General, and Coast Charts, Harbour Plans and Physical Charts. Leaving the Ocean Chart on approaching the land, the sailor turns first to the General Chart, next to the Coast Chart, and lastly to the Harbour Plans. These *plans* of harbours, islands, etc., are constructed on convenient scales for reference when a ship is close in with the land. On these plans are inserted the *leading marks* for channels (*i.e.*, two conspicuous objects which if kept in line, or one in front of the other, *lead* clear of dangers), or for avoiding hidden rocks or shoals, with numerous other details of importance to the sailor.

The surface of the sea on charts will be seen to be studded with numerous small figures. These are the soundings; they indicate, in fathoms or feet, at low water spring tides, the least depth of the water through which the ship may be moving. They show the nature of the unseen bottom of the sea, and give information of the utmost importance to the sailor. No matter how well the land may be surveyed or finely delineated, unless the soundings are shown, a chart is of little use to the navigator.

On the Coast Sheets and Harbour Plans all Lighthouses, Light-ships, Gas-buoys, Buoys and Beacons are most carefully shown; and their several characters, colours, and ranges of visibility clearly noted. In consequence of the changes that are constantly occurring through the building of new lighthouses, the improvements

and alterations in the character of the old lighthouses, the changes that necessarily happen in the buoyage of channels, the discovery of new dangers, and the variations that in the course of time take place in the mouths of rivers, the charts in use on board ship perpetually require correction. The Admiralty and Trinity House issue from time to time *Notices to Mariners*, giving full information upon these alterations, which it is the duty of the sailor to see made upon his charts. The Orient Company have their charts inspected and corrected before each voyage, and every care is taken to ensure their steamships leaving port as efficiently provided as are the vessels of Her Majesty's Navy.

Dead Reckoning is a method by which the ship's position is found from the courses steered, and the distance she appears to have run through the water. Every day at noon the progress the steamer has made in the past twenty-four hours is deduced from the hourly entries in the log-book; the amount of change she has thus made in her latitude and longitude is found by plane trigonometry, applied to the position found for the preceding day, and the new situation determined. The latitude and longitude so estimated are entered in the log-book as the "Position by Dead Reckoning." The place of the ship thus found must, however, be considered as approximate, as, in working the dead reckoning, no account can be taken of unforeseen changes in the compass (see p. 185), drift caused by the violence of wind—errors that may occur, even in the most carefully conducted ships, in steering and logging. Nevertheless, in fogs and cloudy weather, when the land, or sun, or stars cannot be seen, dead reckoning is the only method of finding the ship's position. The constant care of the good pilot is therefore to see that the ship is kept upon her course, that the distance run is correctly estimated, and that the position by dead reckoning be considered of the utmost importance.

Among the causes which prevent the true position of the ship from being found by dead reckoning are the currents of the ocean. The ship is not only moving through the water, but that water may also be moving over the surface of the globe. There are Drift currents, and Stream currents. The Drift current is merely the effect of wind upon the surface of the water, as the drift of the Trade wind, where the whole surface of the sea is converted into a slow current moving to leeward. The Stream current is caused by the accumulation of this drift into a collective mass by the intervention of some obstacle; the water thus banked up takes the direction imposed upon it by the obstruction, and becomes a stream or current pursuing its way like a vast river through the ocean. These "oceanic rivers," of which the well-known Gulf Stream in the North Atlantic, and the Agulhas current in the South Indian Ocean, may be cited as instances, vary in breadth from 50 to 250 miles, and

run with such rapidity as to be uninfluenced materially by wind, except near their borders. The stream currents are generally warm, and where they flow against the colder waters from the polar regions, sailors are prepared for unsettled weather, with cross and turbulent seas, which always attend these meetings of the waters. As a practical knowledge of the localities, directions, and velocities of these ocean currents is most necessary to the navigator, special charts are published by the British Admiralty, giving full information upon this important subject.

The tide is the rising and falling, together with the flowing and ebbing, of the waters of the ocean, and of bays, rivers, etc., connected therewith, which generally takes place about twice a day, becoming each day later by half an hour to an hour. The rising and flowing of the waters is called *flood-tide*, the falling and ebbing, *ebb-tide*.

The current or horizontal movement which accompanies the vertical action of the tide, and changes its direction with the ebb and flow, is the effect of the alteration of the level of the water during the passage of the tide-wave. Also, when a body of water in a channel has been set in motion, the motion does not immediately cease with the cause that produced it. Hence the *tide-current* does not necessarily, and in all cases, change with the tide; and thus, under certain circumstances, the current of the ebb continues to run for some hours after the flood-tide has made.

It is considered probable that many of the anomalies in recorded times of tide have arisen from thus confounding the time of high or low water with the time of slack water.

This rising and falling, this flowing and ebbing, is caused, not only by the moon, but also by the sun, though, from her greater nearness, the moon has by far the greater influence; and the general result would, naturally, until the observations were analysed, be attributed exclusively to her.

The attraction of the moon acting most strongly on those parts of the ocean which are nearest to her, that is, over which she is vertical, tends to draw these parts towards her, while their place is supplied by the water at the sides of the globe. And since the central parts are likewise more affected in the same action than the surface at the opposite, or farthest side, the figure of the earth becomes elongated in the direction of a line drawn towards the moon; that is, the water is accumulated at the point exactly under the moon, and at another point distant from the former 180° in latitude and longitude. The moon, in her progress to the westward, causes thus, at each meridian in succession, a high water, not by drawing after her the water first raised, but by raising continually that under her at the time.

The opposite high water, or, as it is called, the *inferior* tide, would, if the moon's action was uninterrupted, follow the other, or *superior* tide, after the interval of half a lunar day, or 12h. 24m. on the average.

Again, the sun, acting in the same manner, though with less force than the moon (in consequence of his distance more than counterbalancing his greater magnitude), produces two tides, which would follow each other, if uninterrupted, after an interval of half a solar day, or twelve hours.

But, instead of four separate tides produced by the independent actions of both bodies on the mass of waters in their original form, the effect produced is the same as if, after one of the bodies, as the moon for example, has given a form to the waters, the sun alters that form, the two separate actions thus producing a joint result. Hence the place at which it is high water is that at which the *sum* of the heights of the tides produced by the two bodies is greater than anywhere else.

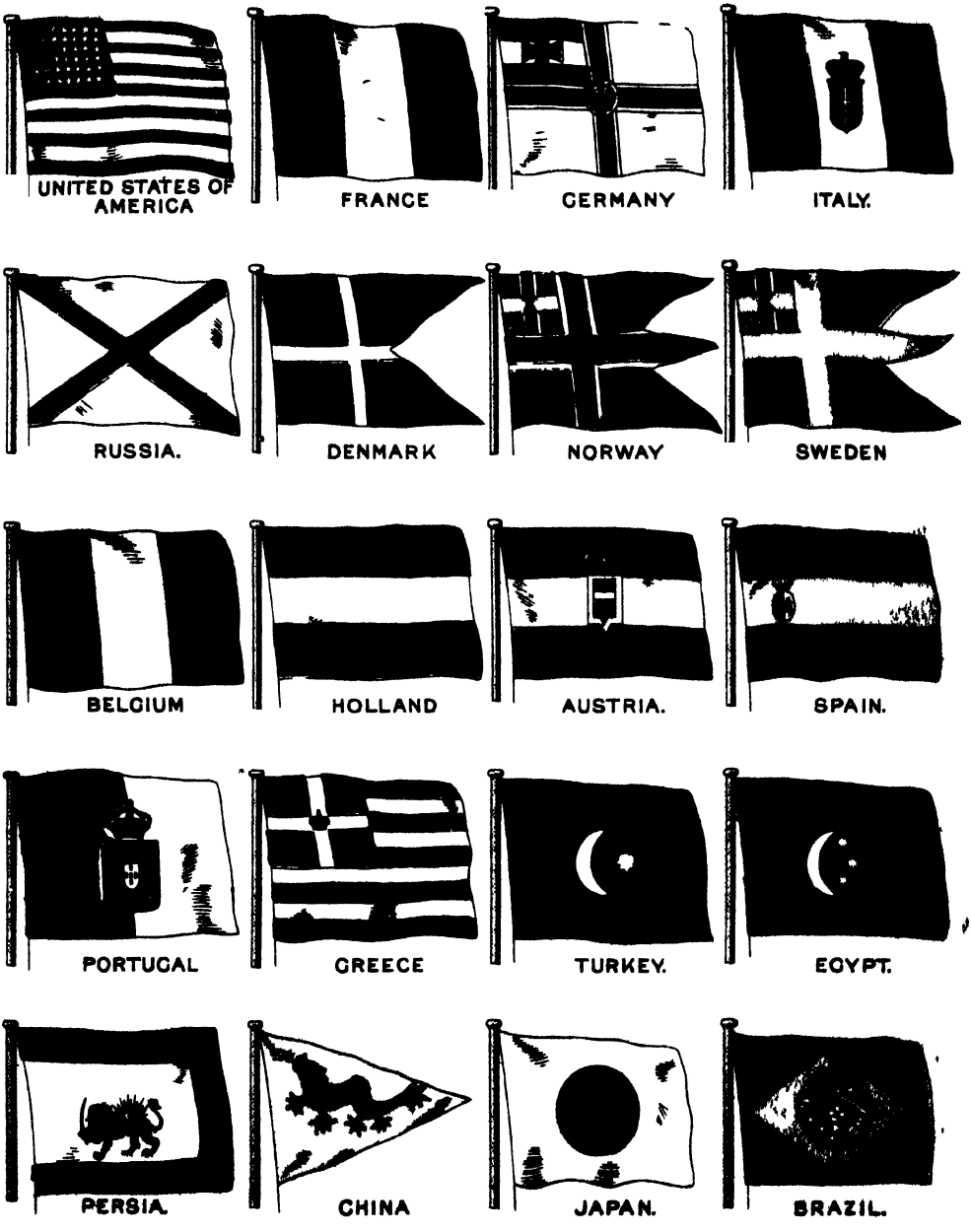
When the sun and moon are on the meridian together, their actions concur, and the tide is higher than at any other time. The same holds when they are in opposition. These highest tides are called *spring-tides*, and occur after new and full moon. Again, when the sun and moon are 90° apart, their actions tend to neutralise each other; and the *neap-tides*, which occur after the first and third quarters of the moon, are the smallest of all.

If the actions of the sun and moon were, as we have hitherto supposed, uninterrupted by obstacles or forces of any other kinds, the tides would be regular, and their calculation certain. But from the unequal depth of the ocean, and the barriers presented by continents which stand across the natural progress of the tides, their motion is interrupted, and the *tide-wave* (as the accumulation of waters is called), abandoned by the forces which originated it, becomes subjected to the mechanical action proper to waves in general.

It is necessary to distinguish between the motion of a wave and that of a current. A wave is not an absolute transfer of the body of moving water in the direction of the motion of the waves, but is a motion perpendicular to the surface, or up and down. The motion of waves is represented in the fluttering of a flag and the shaking of a sail. It is easy to see that this kind of motion is compatible with immense velocity, without any appreciable current in the water itself; thus the tide-wave appears to pass from the Cape of Good Hope to Cape Verd, a distance of over 3,600 miles, in about twelve hours.

The *height* of the tide is the difference between the level of high water and that of low water. The height of the tide in the open ocean is supposed to be very small; and the great heights observed on some shores are evidently due to the

NATIONAL ENSIGNS FOR MEN OF WAR



shoaling of the water and the narrowing of the channel. The tides are insensible, or very small, in inland seas; as also in high latitudes, except from local causes.

It is found, in general, that the tide is not due to the moon's transit immediately preceding, but to a transit which has occurred some time before. The time thus elapsed between the transit at which the tide originated, and the appearance of the tide itself, is called the *retard*, or *age of the tide*.

Those spring-tides are the highest which follow the day of new, or full moon by one, two, or three days, depending on the locality: for instance, the highest tides take place on the west coast of Ireland and on the south coast of England, three transits after the new and full moon, unless diverted by gales of wind, or other extraordinary causes. Along the east coast of England, the highest tides take place four transits after the new and full moon. In the river Thames they occur five transits after the same epoch. These differences arise from the fact that the same tide-wave which produces high water on the west coast of Ireland, takes half a day in its progress thence to the east coast of England, and a whole day before it arrives in the river Thames. When the moon is in perigree, or nearest to the earth, the rise and fall is sensibly increased. The spring-tides are greater about the times of the Equinoxes, *i.e.*, about the latter end of March and September, than at other times of the year; and the neap-tides then are less.

The height from low water to high water is called *the range of the tide*. On the coasts of England it is greatest at the head of the Bristol Channel, where spring-tides sometimes rise forty-seven feet. In some parts of the coast the range does not exceed four feet. The times at which high water takes place are equally various. Thus, the same day that it is high water at Dover, at noon, it is not high water at London until 3h. p.m., and at Hull until 7h. 30m. p.m.

The interval between the time of Transit of the Moon, and the time of high water on Full and Change days at any particular place, is termed the "Vulgar Establishment of the Port"; this being ascertained by observation, the intermediate tides can be deduced from it. The corrected or Mean Tide hour or "Establishment" is the mean of all these intervals between Full Moon and New Moon or *vice versâ*, and may differ as much as 40m. from the "Vulgar Establishment."

The Diurnal Inequality is a feature in tidal phenomena, which being particularly small in British waters, has not received the attention it merits from the English sailor, for in the Indian seas, and indeed in most other parts of the globe, this diurnal inequality is a regular change, considerable in amount, and almost universal in prevalence; this change depends principally upon the moon being north or south of the equator; its maximum is consequent on, but not necessarily simultaneously with, the

moon's greatest declination, and the period of its vanishing corresponds in like manner with the time of the moon passing the equator.

In consequence of the diurnal inequality, it sometimes happens that the day tides are higher than the night tides, or the reverse, for many weeks together. And hence it has sometimes been stated at such places, that the day tides are always the highest, or the reverse. But this is not the rule. The rule of the diurnal inequality depends on the declination of the moon and sun. If the day tides are the highest at one time of the year, they are the lowest at another.

The diurnal inequality sometimes affects the time of high water as much as *two hours*, that of low water about *forty minutes;* at the same time a variation of *twelve inches* may be observed in the height of high water, and *thirty-six inches* in that of low water. Such effects are far too great to be neglected either in the prediction of tides or the reduction of soundings.

It remains to be noticed that the directions of *strong winds*, as well as the *varying pressure of the atmosphere*, considerably affect both the times and heights of high water. Thus, in the North Sea, a strong N.N.W. gale and a low barometer raise the surface two or three feet higher than the predicted heights, and cause the tide to flow all along the coast from the Pentland Firth to London half an hour longer than the times predicted in the Tables. Easterly, S.E., and S.W. winds produce opposite effects, which will be felt as far down the Channel as Dungeness. On the contrary, at the entrance of the Channel, at Plymouth, and as far up as Portland, south-westerly winds, with a low barometer, raise the surface of the water; and north-easterly winds and a high barometer always lower it.

The invaluable and constant standard of reference in a ship is the compass. But the compass is seldom employed, as is sometimes imagined, as an independent guide. As has been before remarked under the head of "Dead Reckoning," the place of the ship found by compass and log-line must be considered as approximate. It is, therefore, indispensable that when weather permits, the ship's position should be obtained daily by astronomical observations. Before treating of the methods by which a ship's position is found at sea by the assistance of sun, moon, or stars, or "by observation," it will be necessary to describe briefly the instruments used in that process—viz., the Sextant and the Chronometer.

For the purposes of navigation, an instrument is required by which the angle at the eye between a celestial body and the horizon can be accurately measured. The want of such an instrument was severely felt by our forefathers of the sea, who nevertheless did great things in navigation by means of the cross-staff and astrolabe. The cross-staff consisted of a straight, square, graduated staff, with two wooden

cross pieces, called *transversaries*, made to slide along it at their middle parts. The bearing of the sun was taken with the compass; then the end of the staff was held against the observer's eye, while an assistant moved the *transversary* until one end of it touched the sun's centre, and the other end the horizon. The astrolabe was a graduated circle, having a movable diameter carrying sight vanes; it was suspended by a ring made to represent the zenith, and the angle was measured by moving the diameter until it was directly in line with the sun from the eye. It was with such indifferent implements that our Elizabethan sea fathers got their altitudes, made their own charts, circumnavigated the globe, and overcame apparently insurmountable difficulties, by a capacity for taking trouble, and a desire to do well.

The great want of an efficient instrument was met in 1730 by John Hadley, who by the invention of the sextant conferred a never-to-be-forgotten benefit upon the sailor. In the sextant, two mirrors, one movable and one fixed, are used to measure the required angle by means of reflection. The movable reflector, called the index glass, is placed at one end of a metal bar, on the other end of which is a vernier, that can be moved round a graduated scale, which is marked upon the curved side of the sextant. The fixed reflector, called the horizon glass, has only one half of its surface silvered; the observer looking at the horizon through the unsilvered half, by moving the bar carrying the index glass, causes the edge or limb of the reflected image of the heavenly body seen on the silvered half of the horizon glass, to just touch the line of the horizon. This done, the observer next clamps the bar to the graduated side of the sextant, makes a careful contact by means of a tangent screw, and then reads the required angle noted thereon. Shades are attached to the sextant to moderate the brightness of the sun.

Provided the sun or stars are in sight, and the horizon clear, the navigator can always obtain his position by observation. The heavens may be regarded as a hemispherical vault, termed the celestial concave, resting on the curved circular surface of the earth, in the centre of which curved surface he stands. Where the vault touches the circumference of this surface is the *Horizon*. Exactly over his head in the vault is the *Zenith*, distant therefore a little more than 90° from the *horizon*. Now in this vault is a fixed point known as the Pole of the heavens, around which all the heavenly bodies appear to revolve. If this *Pole* was marked in the sky, the determination of the latitude would be simple, for it is a well-known astronomical fact that the *altitude*, or angular distance of the *Pole* from above the horizon, is equal to the latitude of the place, and therefore appears to change its position as the ship changes her

latitude, thus: when on the earth's equator the Pole is on the horizon. If a ship attained the North or South Pole, the pole of the heavens would be in the Zenith. By means of the *Nautical Almanac* the sailor is able to find at any instant the distance on the celestial concave between the sun's centre and the *Pole*. This is called the *Polar Distance*. Every day at noon the sun, on attaining its highest altitude, is said to "cross the *Meridian*." At the instant that the sun crosses the *Meridian*, the sailor measures the apparent *altitude* with his sextant. From this *apparent altitude* the *true altitude* of the sun's centre above the horizon is found by applying certain well-known corrections. Then by subtracting this *true altitude* from 90°, the true distance of the sun's centre in the celestial concave from the *Zenith* is known. This is called the *Meridian Zenith Distance*. The difference between the *Meridian Zenith Distance* and *Polar Distance* must be the difference between the *Zenith* and the *Pole;* which, if taken from 90°, will give the *altitude* or height of the *Pole* above the *Horizon*, which is the latitude of the place. This observation to determine the latitude by sun, moon, or star, must be taken at the moment of the body's highest altitude—in other words, at its "meridian passage." This explains the assemblage of officers with their sextants every day when at sea, a little before noon.

It has been said above that if the "Pole was marked in the sky, the determination of the latitude would be simple." Now, to a certain extent, the North Pole is so marked, by having at the present time a bright star very near it, known as Polaris. The altitude of this star is observed by sailors on favourable nights, when the horizon is clear and illuminated by the moon, and after certain small corrections, taken from the *Nautical Almanac*, the latitude is obtained.

Latitude is also found on such nights from the Meridian altitudes of planets and bright stars, the process being the same as with the sun. The latitude and longitude is often obtained from observations of stars, taken just after sunset, or just before sunrise, the light at that time not being sufficiently powerful to obscure the star, and yet strong enough to illuminate the line of the horizon.

Time is an important element in the practice of navigation, for, as it has been before remarked, longitude is measured in hours as well as in degrees. All places upon the earth's surface have a different time (see chart, p. 173), unless they happen to be situated exactly upon the same meridian—*i.e.*, upon the same great circle which passes through them and the Poles of the earth. There is Greenwich time and Paris time, Melbourne time and Sydney time. The cause of this difference of time is the rotation of the earth. As the earth revolves, every spot upon its illuminated surface must come in turn directly under the sun. At that instant the

sun appears to attain its highest altitude, is said to be on the meridian of the place in question, and it is there noon, or 12 o'clock *by the sun*.

As the earth completes one revolution under the sun in about 24 hours, and moves uniformly, it is evident that distances can be measured by time; the 360 degrees of the earth's circumference representing 24 hours, 180 degrees 12 hours, 90 degrees six hours, etc. If, then, we can ascertain the true difference of time between two places, we know the distance their respective meridians are apart, and therefore their *difference of longitude*. To find the time at the ship is a simple matter, as will shortly be shown; the difficulty is to find the time at Greenwich. Longitude, as has been before pointed out, is reckoned from Greenwich. If the time at Greenwich be accurately known, then the difference between that time and the time at the ship must be the longitude *in time*. The inability to find reliable Greenwich time at sea, the great difficulty with our forefathers, was solved by the invention, by J. Harrison, in 1765, of the *Chronometer*, or, as it has been well called, the *Timekeeper*. Hadley gave us the sextant; Harrison the chronometer; may their names live for evermore!

The chronometer is a watch of superior construction, used by the navigator to determine his longitude. Its mechanism is upon the same general principles as that of a common watch, with the addition of a contrivance for counteracting the effects of changes in temperature. The chronometer is therefore furnished with a compensation balance, formed by a combination of metals of different expansive capacities. Another cause which affects the good going of watches is the violent action to which they are at times subjected. Chronometers are, therefore, defended from violence by their cases being lined with cushions; they are kept in a horizontal position by suspension in gimbals, and, on being received on board, are stowed in a room specially prepared for their reception, and on no account subject to removal or displacement. By means of the chronometer the navigator is able to carry in his ship that desideratum, Greenwich time. On leaving port he is careful to know the *error of his chronometer*, *i.e.*, how much it is fast or slow of Greenwich time; he also finds its *daily rate*, or the number of seconds the chronometer may gain or lose every twenty-four hours; by these means he is able, with very little labour, to tell at any required instant during the voyage the time at Greenwich, or what is known to the sailor as *Greenwich mean time*.

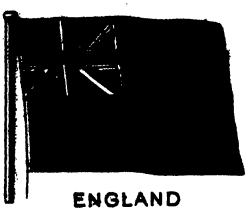
Provided there is a clear horizon the time at ship may be found by the aid of the sun or stars. It will be sufficient here to explain how it is found by means of the sun. The sun, as it appears to pass across the sky, may be regarded as the hour hand of a great celestial clock, moving round the pole of the heavens as the

centre of the clock. At the instant of the sun's attaining its highest altitude, or crossing the meridian, it is twelve o'clock *by the sun*. Could the hours be marked in legible characters upon the firmament, no observations nor calculations would be necessary; as, however, these facilities are denied to the mariner, he has to resort to a process by which he can determine the time at ship. In any spot on the earth of which the latitude is known, the time can be found from the altitude of the sun, because in its apparent course across the celestial concave, between rising and setting, the sun attains certain altitudes at certain times. By help of the sextant the altitude of the sun is measured, which altitude, corrected and subtracted from 90°, gives the distance of the sun's centre from the zenith; the known latitude subtracted from 90° gives the distance between the zenith and pole; while the distance of the sun's centre from the pole is found in the *Nautical Almanac*. Thus we have a great spherical triangle formed in the sky between the pole, the zenith, and the sun; from which all the sides being known, the angle at the pole, or the *time*, is calculated by spherical trigonometry.

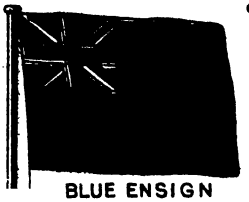
Attention must here be called to an important fact that the time obtained by observation at the ship is called *ship apparent time*, or time as would be shown by a sun-dial on shore. Before this time can be used to determine the longitude, it has to be corrected by what is called the *equation of time;* that is the difference between sun time, or time shown by a sun-dial, and the time shown by a clock going correctly. This difference, given in the *Nautical Almanac*, and noted in ordinary almanacs as "clock before sun," or "clock after sun," amounts twice in the year to more than a quarter of an hour. The *ship apparent time* is, therefore, corrected by the equation of time, and time by the clock, or ship mean time, is found. At the instant of taking the altitude the time by chronometer is also noted, and Greenwich mean time obtained; the difference between which and the ship's mean time is the *longitude in time;* this converted into arc or degrees gives the *longitude;* named "west" if Greenwich mean time is *best*, or the greater; and "east" if Greenwich mean is *least*, or the lesser. The *latitude* has already been found from the meridian altitude of the sun, and the ship's position is thus satisfactorily determined by observation.

Greenwich mean time may be obtained at sea by the heavenly bodies independently of the chronometer. Certain phenomena can be predicted to take place at certain times at Greenwich, such as the eclipses of Jupiter's satellites, or the occultation of stars by the moon. In the *Nautical Almanac* there is a table showing at every third hour of Greenwich mean time the distances in the celestial concave between the moon and the sun, and also certain well-known stars, that

NATIONAL COLOURS FOR MERCANTILE MARINE.



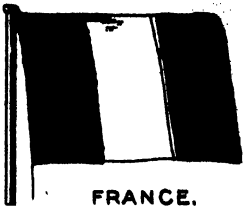
ENGLAND



BLUE ENSIGN
NAVAL RESERVE.



UNITED STATES OF
AMERICA.



FRANCE.



GERMANY.



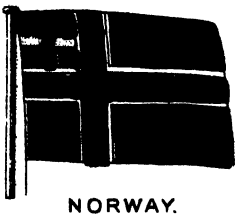
ITALY.



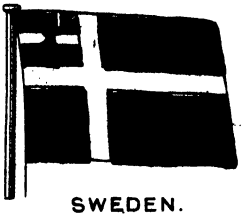
RUSSIA.



DENMARK.



NORWAY.



SWEDEN.



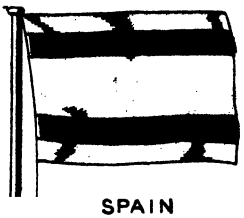
BELGIUM.



HOLLAND.



AUSTRO-HUNGARY.



SPAIN



PORTUGAL.



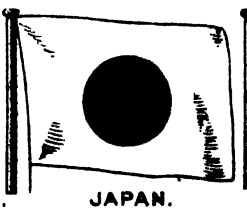
GREECE.



TURKEY & EGYPT.



MOROCCO. ZANZIBAR.



JAPAN.



BRAZIL.

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lie in or near the moon's path. The moon is thus made to represent the hand of a celestial clock, showing *Greenwich mean time*, the sun and stars being considered as the figures on the dial plate, but not placed as in an ordinary clock at uniform distances. These distances, measured by a sextant and corrected for the effects of refraction and parallax, become the *true lunar distances*. With a distance thus observed and corrected, the *Nautical Almanac* can be entered and the corresponding Greenwich mean time found. Ship mean time being obtained at the same instant, the longitude can be found as before.

To observe the eclipses and occultations requires a steady and powerful telescope; to measure the distance between the moon and the sun and stars necessitates the possession of a superior class of sextant, advanced observing powers, and some labour in calculating the true lunar distance, the resulting determinations being much more liable to error than those obtained by chronometer. An error of half a minute of arc in measuring the lunar distance would affect the longitude to the extent of fifteen miles.

Making the land during or at the end of the voyage is one of the most important operations in navigation; to make a good *landfall* being a point of honour with a proper pilot. Letting it be granted that favourable weather has allowed the ship's position to have been obtained by observation, there is but little difficulty in making the land of a coast that is fairly laid down upon the charts. It is said that at such an hour a certain lighthouse or headland will be seen, or if soundings have to be taken, that such a depth of water will be found, and these predictions will be found to be trustworthy.

At times, however, the land has to be made when the sun or stars have not been seen for days; then is felt the value of *keeping a good Dead Reckoning and possessing a knowledge of the currents*. There are, of course, even to the passenger, numerous indications of the vicinity of land: coast birds and sea-weed may be seen, more vessels may be passed, and the water may change its tint; but in thick weather the captain, on approaching land, trusts to one of the best inventions for saving life at sea—to that simple but important instrument, *the lead*, which is nothing more than a piece of lead attached to a line, measured and marked in fathoms, used to ascertain the depth of water through which the ship is moving. The depth of water and nature of the bottom of the sea is shown upon the chart by means of small figures called soundings (see "Charts," page 201). By their aid, and using the lead as a beetle does its antennæ, the pilot feels his way in towards the land, in the densest of fogs. Modern ingenuity has invented sounding machines by which the soundings in deep water can be obtained with greater facility, but the principle

is the same, and when in less than twenty fathoms the old lead and line is still used. It may here be remarked that true sailors never neglect the four L's in navigation, *viz.*, Lead, Log, Lookout, and Latitude.

When in sight of land the position of the ship is fixed from time to time by taking what are called "cross bearings." Two straight lines can cross each other only in one point. If at the same time a lighthouse bear north from a vessel and a promontory north-east, and lines on their bearings are ruled from the same lighthouse and promontory upon the chart, the intersection of those lines must be the vessel's position on the chart. The place of the ship may also be found by the "four-point bearing." Any prominent point or building that may be marked upon the chart is watched as the vessel steams along until it bears four points on the bow—*i.e.*, if the ship be steering west, until it bears north-west—the time is then noted. The ship is carefully kept upon the same course, and when the same object is exactly abeam, that is at right angles to the course the ship is steering, the time is again noted. The object abeam will then be the same distance from the ship as she has run in the interval. Due allowance must be made for the set of the tide.

The distance from lighthouses or peaks and points of land, the heights of which are known, may be found by measuring with the sextant the vertical angles they subtend to the eye; tables are published in which the required distance will be found by entering the table with the observed angle and known height of the lighthouse or peak.

A hidden rock or shoal may also be avoided by means of what is called the "horizontal danger angle," based on the mathematical fact that the angles in the same segment of a circle are equal to one another. Two well-known and well-marked points, as two lighthouses, in the vicinity of the rock are selected; through these points a circle that also passes clear of the rock is drawn upon the chart; the angle subtended by the lighthouses at the circumference of this circle is next found. If by means of the sextant this angle is maintained between the lighthouses, the ship will be steaming along the circumference of the drawn circle, and therefore must pass clear of the danger.

Buoys will be also seen marking dangers, or the edges of navigable channels. In 1883 a uniform system of buoyage was adopted by the Trinity House to mark, by the character and colour of the buoys used, the port and starboard sides of channels; and also any middle dangers that might exist. This system has been carried out in England. Other nations have their own buoyage methods. A uniform international system of buoyage would be a great boon to the nautical world.

By night the lights on the coast make navigation easy. These lights are made to differ so that the sailor may the more readily determine the position of his vessel. One will be "fixed," another will flash every few seconds, while a third will "revolve" and show its light but once in a minute; some are coloured, others exhibit lights of greater or less brilliancy. In cases where the features of a coast are not strongly marked, or in hazy weather, it is easier to navigate by night than by day, because before one known lighthouse is lost sight of, another is recognisable.

The distance in miles of the visible horizon is a little more than the square root of the height in feet of the observer's eye above the sea. For example, if the observer's eye be twenty-five feet above the sea, the visible horizon will be over five nautical miles off. Any object seen at sea whose base is beyond or farther off than the horizon, must have the square of its own height in feet added to the distance the observer is from the horizon, to give the distance of the object. For instance, suppose that the observer see only the topsails of a ship showing above the horizon, and these topsails are sixty-five feet above the sea, that ship will be about nine miles beyond the horizon, and fourteen miles distant from the observer.

Guns are often fired in a port. Take the time of the flash and the time of the sound reaching the ear. Divide the seconds elapsed by five, add one-twelfth of the quotient, and the result is the distance in statute miles. Most pocket chronometers beat 150 times in one minute, common watches vary. At a temperature of 60° Fahr. sound travels 150 yards in one beat of a chronometer, beating 150 times in one minute, so that if the beats of a chronometer be counted during the interval that elapses between seeing the flash and hearing the report of the gun, that number of beats multiplied by 150 will represent roughly the distance in yards of the observer from the gun fired.

When the port to which the vessel is bound is approached, she is boarded by the local pilot, who conducts her to the anchorage; cross bearings, to fix the position of which being duly taken, the navigator's duties cease for a season.

Although these methods for determining the ship's position may appear so simple as to be adapted to the meanest mathematical capacity, it must be remembered that however easy navigation may seem when carried on free of care and anxiety in a comfortable college or law court *on shore*, Pilotage, common and proper, will be found a very different business when pursued by responsible men in a gale of wind at night, or in hazy weather on board a ship *at sea*. The use of iron in modern shipbuilding, by its natural effect on the Mariner's Compass, has greatly increased the difficulties of navigation at sea (see pp. 182-188). The

observant and considerate passenger will soon discover that in obtaining the necessary observations in foul weather, as in fair, and in conducting the vessel in safety from port to port, a never-ceasing watchfulness is required, and that there is but little rest for the "toilers of the sea" in their continuous struggle with the elements. Proficiency in the science and handicraft of navigation can be attained only by incessant practice at sea, and requires both a capacity for taking trouble and unremitting attention. The true secret of the sea is thus known to few, for

> "Only those who brave its dangers
> Comprehend its mystery."

A sea voyage affords a peculiarly favourable opportunity for forming acquaintance with some of the laws of the weather. The knowledge thus acquired will be found valuable in shore life. In this exposition we have but called attention to the great amount of useful knowledge that may be acquired on a sea voyage by the study of the matter man sees around him.

The one great function of the meteorologist at sea is the recording of facts. The Marine Department of the British Meteorological Office, under the experienced guidance of Robert H. Scott, F.R.S., and the late Captain Toynbee, has been for years collecting and collating facts from the "weather logs" forwarded from all parts of the ocean. The Office issues a form of log to any who will fill in and return it. These records have already produced many valuable results. The paths of gales and cyclones have been traced, and elaborate wind charts for various portions of the ocean have been published, giving the probable direction of the wind by means of the records of winds actually found blowing in previous years.

The Admiralty publish an atlas containing four Wind Charts of the World, showing for each quarter of the year the probable winds that may be experienced by the sailor as he traverses the various oceans, with isobars and isotherms, *i.e.*, lines of equal barometric pressure, and lines of equal temperature of the air. These Charts were carefully compiled by Commander Hull, R.N., in 1866—1873, from a vast number of trustworthy observations actually made at sea. There is also a Current Chart of the three oceans drawn upon the same principles. This atlas will be found on board the Orient steamships.

In first facing any science it is of the highest importance to educate the mind down to it, by mastering the important simplicities, and obtaining a true knowledge of the facts upon which the science is based. The information here given is therefore elementary, and taken principally from the practical pamphlets published by the Meteorological Office, known as Barometer Manuals for Seamen and Fishermen.

The Hon. Ralph Abercromby's handy work, entitled "*Weather*," has also been used, and is strongly recommended to the would-be student of weather science.

At sea, it must never be forgotten that in practice the ship and the wind are always both moving, not only have the motion of the cyclones and anti-cyclones (see p. 228) in which air travels to be considered, but the course and speed of the ship also to be taken into account. In the following pages will be found a popular explanation of clouds, the nature of the great tools of the meteorologist, the barometer and thermometer, and of the manner in which the indications of those instruments are used in forming an opinion of weather at sea, to be followed by remarks on Cyclones and Anti-Cyclones, Trade Winds, and Monsoons. Concluding with a summary of the weather that will probably be experienced at different times of the year during the passage from England to Australia.

Beaufort Notation, a method adopted in ships' logs and meteorological register to describe the state of the sky :—

b Blue Sky.	**p** Passing showers.
c Clouds (detached).	**q** Squally.
d Drizzling rain.	**r** Rain.
f Foggy.	**s** Snow.
g Gloomy.	**t** Thunder.
h Hail.	**u** Ugly (threatening).
l Lightning.	**v** Visibility { (objects at a distance unusually visible).
m Misty (hazy).	
o Overcast.	**w** Wet (Dew).

A bar (–) under any letter augments its signification; thus **f** very foggy, **r** heavy rain, **r** heavy and continuing rain.

In observing and noting winds, it is usual to give the *true* and not the magnetic direction. The strength, or technically, the force of the wind, is estimated at sea by an arbitrary scale, ranging from 0 to 12; figures which are taken to represent all forces of wind from a dead calm = 0, a moderate breeze = 4, a heavy gale = 8, and violent hurricane = 12.

Colour of Sky, caused chiefly by moisture in the air, is a sure indicator of weather. The chief effects of colour are at sunrise and sunset. A few of the more marked signs of weather—useful alike to seaman, farmer, and gardener—are the following :—

Weather clear or cloudy—a rosy sky at sunset presages fine weather; a sickly grey or greenish hue—wind and rain; tawny, or copper clouds—wind; a dark (or

Indian) red, rain; a red sky in the morning—bad weather, or much wind (perhaps also rain); a grey sky in the morning and a low dawn—fine weather; a high dawn —wind.

Soft looking or delicate clouds foretell fine weather, with moderate or light breezes; hard-edged oily-looking clouds—wind. A dark, gloomy, blue sky is windy; but a light, bright, blue sky indicates fine weather. Generally, the softer clouds look, the less wind (but perhaps more rain) may be expected; and the harder, more "greasy," rolled, tufted, or ragged—the stronger the coming wind will prove.

"And the night-rack came rolling up ragged and brown."

Also, a bright yellow sky at sunset presages wind; a pale yellow—wet; orange or copper colour—wind and rain; and thus by the prevalence of red, yellow, green, grey, or other tints, the coming weather may be, when aided by instruments, in some way foretold.

Light, delicate, quiet tints or colours, with soft indefinite forms of clouds, indicate and accompany fine weather; but gaudy or unusual hues, with hard definitely outlined clouds, foretell rain, and probably strong wind.

Small inky-looking clouds foretell rain; light scud clouds driven across heavy masses show wind and rain; but if alone, may indicate wind only—proportionate to their motion.

High *upper* clouds crossing the sun, moon, or stars, in a direction different from that of the lower clouds, or the wind then felt below, foretell a change of wind toward *their* direction.

After fine clear weather, the first signs in a sky of a coming change are usually light streaks, curls, wisps, or mottled patches of white distant cloud, which increase and are followed by an overcasting of murky vapour that grows into cloudiness. This appearance, more or less oily or watery, as wind or rain will prevail, is an infallible sign.

Usually the higher and more distant such clouds seem to be, the more gradual, but general, the coming change of weather will prove.

Misty clouds forming or hanging on heights, show wind and rain coming—if they remain, increase or descend. If they rise or disperse, the weather will improve or become fine.

Cirrus clouds consist of streaks, wisps, and fibres, vulgarly called "mares' tails," which may increase in any or all directions. Of all clouds it has the least density, the greatest elevation, and the greatest variety of extent and direction or figure.

It remains for a short time when formed in the lower parts of the atmosphere and near other clouds, and longest when alone in the sky, and at a great height. When streaks of Cirrus run quite across the sky in the direction in which a light wind happens to blow, the wind will probably soon blow hard but remain steady. When the fine threads of the Cirrus appear blown or brushed backward at one end, as if by a wind prevailing in these elevated regions, the wind on the surface will ultimately veer round to that point.

Cumulus, a cloud in dense convex heaps in rounded forms definitely terminated above, the lower surface remains roughly horizontal. Cumulus is never seen as such overhead, but only in the horizon, or at a moderate height above it.

When of moderate height and size, of well-defined curved outline, and appear only during the heat of the day, they indicate a continuance of fair weather. But when they increase with great rapidity, sink down to the lower parts of the atmosphere, and do not disappear towards evening, *rain* may be expected.

Stratus is a continuous extended sheet of cloud, increasing from below upwards. It is the lowest sort of cloud. It generally forms about sunset, grows denser during the night, and disappears about sunrise.

Cirro-Cumulus is composed of well-defined, small, rounded masses lying near each other, and quite separated by intervals of sky. It is commonly known as a "*mackerel sky*," it occurs frequently in summer, and is attendant on warm and dry weather.

Cirro-Stratus partakes partly of the characteristics of the Cirrus and Stratus. In distinguishing it, attention must be paid not so much to the form, which is very variable, but to the structure, which is dense in the middle and thin towards the edges. It is a precursor of storms; and from its greater or less abundance and permanence, it gives some indication of the time when the storm may be expected.

Cumulo-Stratus is formed by the Cirro-Stratus blending with the Cumulus, either among its piled up heaps, or spreading underneath its base as a horizontal layer of vapour.

Cumulo-Cirro-Stratus or Nimbus is the *rain cloud*. At a considerable height a sheet of Cirro-Stratus cloud is spread out, under which Cumulus clouds drift from windward; these rapidly increasing unite at all points, forming one continuous mass, from which rain falls.

When a rain cloud is seen approaching at a distance, Cirri appear to shoot out from its top in all directions, and it has been observed that the more copious the rainfall, the greater is the number of Cirri thrown out from the cloud.

Rainbows:—

"A rainbow in the morning—
Sailors take warning;
A rainbow at night
Is the sailor's delight."

Morning rainbows indicate the advance of rain cloud from the west when it is clear in the east; and the fall of rain at the time of day when the temperature should be rising, is regarded as a prognostic of a change to wet, stormy weather.

On the contrary, the conditions under which a rainbow can appear in the evening are: the passing of the rain cloud to the east, and a clearing up in the west, at the time of day when the temperature has begun to fall, thus indicating a change from wet to dry weather.

"The evening grey and the morning red,
Put on your hat, or you'll wet your head."

Generally squalls are preceded, or accompanied, or followed by clouds; but the very dangerous "white squall" (of the West Indies and other regions) is indicated by a rushing sound, and by white wave crests.

The ordinary squall clouds are heavy and black and in the form of an arch.

A squall cloud that can be seen through or under is not likely to bring, or be accompanied by, so much wind as a dark continued cloud extending beyond the horizon.

The rapid or slow rise of a small cloud—its more or less disturbed look—that is, whether its body is much agitated, and changing form continually, with broken clouds, or scud, flying about—or whether the mass of cloud is shapeless or nearly quiet, though floating onwards across the sky—foretells more or less wind accordingly, as we read in 1 Kings xviii. 44, 45: "Behold, there ariseth a little cloud out of the sea, like a man's hand. . . . And it came to pass in the meanwhile, that the heaven was black with clouds and wind, and there was a great rain." This ancient passage is an accurate account of a frequent phase of the weather on the coast of Syria.

In some of the saws about wind and weather there is so much truth that, though trite and simple, their insertion here can do no harm.

Adverting to the Barometer:—

"When rise begins, after low,
Squalls expect, and clear below."

Or—

"First rise, after low,
Indicates a stronger blow."

Also—

"Long foretold, long last;
Short notice, soon past."

To which may be added: In squalls—

When the rain's before the wind,
Halliards, sheets, and braces mind."

And—

"When the wind's before the rain,
Soon you may make sail again."

Also, generally speaking—

"When the glass falls low,
Prepare for a blow;
When it rises high,
Let all your kites fly."

The chief instruments used for obtaining indications of probable changes in weather are the barometer and the thermometer. Of these the barometer is the more important, and it is, therefore, frequently called a "weather glass."

The barometer is a familiar instrument, but few understand all that it tells us. The general opinion is that when the mercury rises in the tube there will be less wind or rain; when it falls, that there will be more wind or rain; and that when it remains steadily high a period of fine dry weather is probable; while when it remains low the weather will continue wet and unsettled.

These interpretations are usually correct, but sometimes wrong, as will be shown in the following notes.

The barometer in its simplest form consists of a straight glass tube, a little less than three feet long, closed at one end. This being filled quite full of mercury, the open end is temporarily covered by the finger, and the tube turned over, with the closed end upwards, the open end is then plunged into a cup or cistern also filled with mercury, and the finger is removed without allowing any air to get into the tube. The mercury in such a tube will sink when the finger is removed until the top of the column stands at a height of about thirty inches above the level of the mercury in the cistern.

The space in the tube above the top of the column of mercury contains no air, and is called a vacuum.

The mercury in the tube of a barometer rises when the whole pressure or weight of the air becomes greater, falls when it become less, and remains at rest when the pressure or weight is unchanged.

Now, the weight of mercury is such that a column thirty inches in height, in the tube of a barometer, will press on the mercury in the cistern, and so endeavour to

fall in the tube, with nearly the same force as the air outside the tube presses on the free surface of the mercury, and so endeavours to hold up the mercury in the tube, or, in other words, the thirty inches of mercury will nearly balance the pressure of the atmosphere, which is about fifteen pounds on the square inch.

The words fair, change, rain, etc., which are often printed on the scales of barometers are of little value. The changes of level of the mercury are greater in winter than in summer, and the height of the column is likewise dependent on elevation above the sea level and other circumstances, so that the same scale of words could not suit all seasons or all places, even if the level of the mercury alone indicated the condition of the weather, which is very far from being the case. It is not to the mere height of the mercury in a barometer on a particular day that we are to look in order to judge of the weather, but to the fact of its having risen or fallen, or remained steady since the day before or the last time it was set, and even this alone will not supply conclusive evidence, as will be explained subsequently.

In both temperate zones, the mercury is found to rise and fall, or to range through a space of nearly three inches, measuring from the lowest position observed on some extraordinary occasions to the highest observed on others, namely, between thirty inches and nine-tenths (30·9), and twenty-eight inches (28·0) or even a little lower. The usual range is from 30·5 inches to about 29·0 inches. In the torrid zone, or near the equator, the range is much less, being only a few tenths of an inch, except in very severe storms or hurricanes, in which the level sometimes falls as low as 27·0 inches.

A sliding scale, called a Vernier (from its inventor, Captain Vernier, in 1631), is provided for most barometers, to assist in measuring the height of the column of mercury. It is invariably used in making accurate observations. In some instruments it is so constructed as to divide the tenths into ten parts each, or into hundredths of an inch, in others it allows of readings being taken to still greater minuteness.

The Aneroid.—In the aneroid, atmospherical pressure is measured by its effects in altering the shape of a small, hermetically sealed, metallic box, from which almost all the air has been withdrawn, and which is kept from collapsing by a spring. When atmospherical pressure rises above the amount which was recorded when the instrument was made, the top is forced inwards, and *vice versâ*, when pressure falls below that amount the top is forced outwards by the spring. These motions are transferred by a system of levers and springs to a hand, which moves on a dial like that of a wheel barometer.



ORUBA

W.L.Wyllie

The aneroid is of great value during hurricanes or very bad weather, especially at night, for it can be registered with great facility, and being portable may be watched constantly, when the marine barometer may not be accessible; moreover its variations occur simultaneously with their causes, showing minute changes, unobservable in the best constructed marine barometers, owing to the pumping of the quicksilver, when the motion of the ship is violent; nevertheless, it should, when opportunity offers, be compared with a good mercurial barometer.

Thermometer.—This instrument shows heat and cold, but is not affected by changes of the pressure of the air. It consists of a glass tube of very small bore, closed at one end, and united at the other to a bulb, which is filled with mercury. Almost all substances swell or expand when they are heated, and shrink or contract when they are cooled. When the thermometer is heated the mercury in the bulb expands and can no longer be contained in the bulb. Its excess, in the form of a thin thread of mercury, rises in the tube. When the instrument is cooled the mercury shrinks, and the thin thread becomes shorter, as it subsides towards the bulb. Thus, then, by observing the length of the thread of mercury, in the tube, as measured by the graduation at its side, the thermometer shows the temperature at the time.

The indications of a thermometer are recorded in degrees (°), not in inches like the barometer. There are two fixed points on the scale by which thermometers are graduated,—viz., that at which ice melts and that at which water boils. In the thermometers in use in England, the distance between these two points is divided into 180 parts, or degrees. The point at which ice melts, measured on this scale, is thirty-two degrees (32°), and that at which water boils, when the barometer reading is thirty inches, is two hundred and twelve degrees (212°).*

The Hygrometer measures the dampness of the air. There are several kinds of hygrometers, but the easiest to make and to manage consists of a pair of thermometers placed near each other. If one of these be fitted with a piece of thin

* This graduation is the earliest adopted, namely by Fahrenheit, at the beginning of the eighteenth century. There are other forms of graduation, Centigrade, in which the freezing point, the 32° of Fahrenheit, counts as 0°, and the boiling point as 100°, and Réaumur, in which the freezing point is 0°, and the boiling point 80°. The different scales are easily convertible by tables. There is one for this purpose in Whitaker's Almanac. Fahrenheit's thermometer is generally used in this country, and Réaumur's and the Centigrade abroad. There are disadvantages in the scales of Réaumur and Centigrade, as the length of each degree is much greater than in Fahrenheit, and not so easily nor accurately read when the mercury is between the lines of division; and the temperatures requiring to be registered being often below the freezing of water, are always obliged to be expressed by negative signs.

linen fastened tightly around the bulb, and this coating be kept damp by means of a few threads of darning cotton or lamp wick, which are tied loosely round the stem so as to touch the linen, and have their lower ends dipping into a cup of water placed close to the thermometer, it will usually show a temperature lower than that shown by the other thermometer which is near it, the depression of the wet bulb being dependent on the degrees of dryness of the air.

A thermometer fitted in the manner described above is called a wet bulb thermometer to distinguish it from an ordinary thermometer which has its bulb dry.

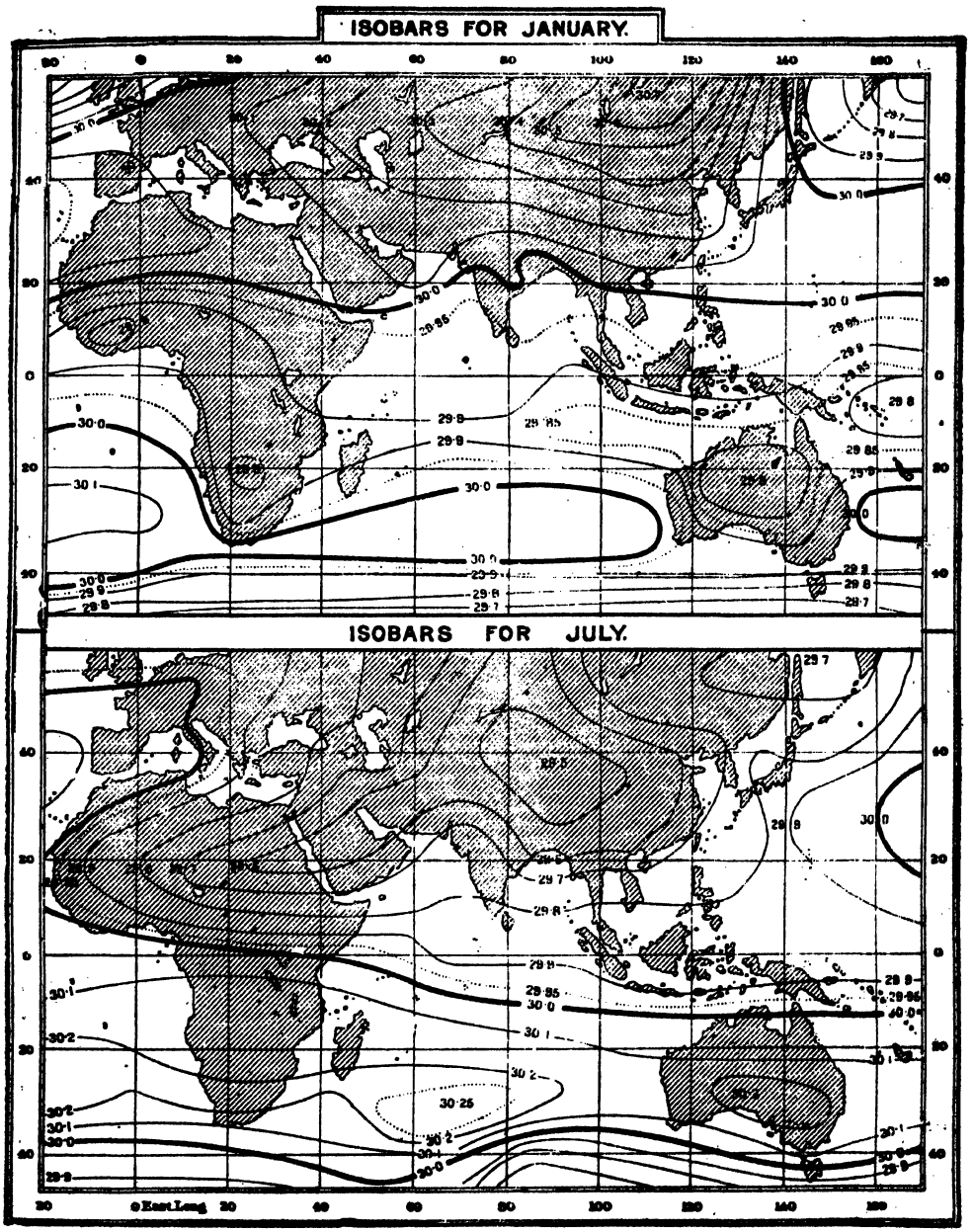
The wet bulb thermometer is cooled by evaporation. When the atmosphere is very damp or moist, during or just before rain or when fog is prevalent or dew is forming, there is little or no evaporation, and the two thermometers read very nearly alike, but at other times the wet bulb reads lower than the dry, because the water dries off from the linen coating, and in order to dry off or to be evaporated it requires heat, which it takes from the thermometer itself. The evaporation is greater as the air is drier, and accordingly the difference in readings between the dry and the wet bulb is then also greater. The difference sometimes amounts to ten or fifteen degrees in England, and to twenty or even more in other parts of the world.

Changes in weather almost always give some warning of their coming, and the instruments are usually affected before the wind actually begins to blow or the rain to fall; thus the instruments may be said to enable us to feel the pulse of the atmosphere. We have already seen how the appearance of the sky will aid us in forming an opinion as to probable weather. But the length of time which passes between the first indication of a change of weather and its actual setting in, is not always the same.

The barometer, feeling the pressure of the air, shows at once when that pressure is changing in amount. When the pressure is unequal over a tract of country, the air begins to move, to re-establish uniformity of pressure, and thus *wind* is caused. Thence the barometer, by its changes, shows pretty accurately when wind or change of wind may be expected. A change of weather comes almost always with a change of wind, and because landsmen generally, particularly farmers and gardeners, care more about rain or snow than about wind, these classes have got into the habit of looking at the barometer in order to see whether the weather is going to be wet or dry.

Used without discretion, the barometer is almost as likely to mislead the person consulting it as to guide him aright. The barometer has but two motions—rising and falling—by which to indicate all changes of weather; and any conclusion drawn from its movements require to be checked by observations of temperature, moisture of the

WEATHER AT SEA.



air, the present and previous direction and force of wind, and the state of the sky, before a correct opinion can be formed as to what may be expected.

Temperature, subject to the changes that follow the seasons of the year, or the time of day, is influenced, in the first instance, by the direction of the wind, which may come from hot or cold regions, and in the second, by the height of the barometer, for the higher the barometer the lower is the temperature of all winds, except in hot summer weather.

The dampness of the air, the amount of cloud, and the chance of rain, as well as its amount, are all connected, to some extent, with atmospheric pressure, and, roughly speaking, they are all great when the barometer is low, and small when the barometer is high.

Isobaric Charts.—Barometric observations are entered on charts; lines are then drawn through all the places in which the pressure is the same for each successive tenth of an inch.

The accompanying charts show the mean barometer pressure between England and Australia for the months of January and July respectively, according to the best data available. On these charts lines are drawn showing where certain barometric pressures, at intervals of each tenth of an inch, indicated by the figures upon them, have been observed. These lines are termed Isobaric lines, or isobars, because they pass over places having equal barometrical pressure.

From these charts it will be seen that, speaking generally, in both hemispheres, in the cold season or winter, *i.e.*, in January in the northern, July in the southern, the barometer is highest over the land, which is then colder than the sea; and lowest over the sea, which is then warmer than the land. In the summer the barometer is lowest over the great continents, which are then relatively hot, and highest over the sea, which is then relatively cool. The summer and winter occurring at opposite times of the year in the north and south hemispheres, the greatest development of high pressure in the northern hemisphere is seen in the January chart, and in the southern hemisphere in the July chart, and *vice versâ*. Over the equator and between the tropics, where the temperature is always comparatively high, the barometer is low relatively to the neighbouring zones just beyond the tropics, where the temperature is relatively low, and the barometer is high. The variations of pressure which thus arise over certain tracts of land and sea, are the origin both of permanent winds, such as the Trades, and of periodical winds, such as the Monsoons, those last named following a corresponding periodical change of pressure over the tracts where they are established. In the accompanying charts the difference in the height of the barometer in the Indian Ocean in January and July is very marked. The Isobar of

30·0 in. being found in about latitude 15° N. in January, and in about latitude 10° S. in July. On the parallel of 40° N. in Siberia, the barometer is one inch higher in January than it is in July. On the other hand, the barometer in Australia is four-tenths of an inch higher in July than it is in January.

The barometer charts illustrate the law discovered by Professor Buys Ballot, of Utrecht, and first announced in Europe about twenty years ago. From this law we can tell what wind may blow, at a group of adjacent places, if we know the readings of the barometer.

The law is stated in the following terms:—

"Stand with your back to the wind, and the barometer will be lower on your left hand than on your right."

This is the law for the northern hemisphere, for the southern hemisphere the words "left" and "right" should be interchanged.

Thus the wind will be, or may be expected to be, in the northern hemisphere:—

Easterly when the pressure is highest in the north, lowest in the south.

Southerly when highest in east, lowest in west.

Westerly when highest in south, lowest in north.

Northerly when highest in west, lowest in east.

Next as to the velocity of the wind. This depends, at least in a great measure, on the amount of the difference of barometrical readings over a given distance.

Besides these rules for the relation between the wind and the height of the barometer, there is another about the way in which the wind changes, which is very important. It is well known to every sailor, and is contained in the following couplet:—

"When the wind shifts against the sun,
Trust it not, for back it will run."

The wind usually shifts clockwise, *with watch hands*, *i.e.*, from left to right, in front of you. A change in this direction is called *veering*. Thus an east wind shifts to west through south-east, south, and south-west, and a west wind shifts to east through north-west, north, and north-east. If the wind shifts in the opposite way, viz., from west to south-west, south, and south-east, the change is called *backing*, and it generally indicates that a new storm is approaching. The reasons for this will be explained further on. However, slight shifts of wind do not follow this rule exactly; thus, for instance, the wind often shifts from south-west to south and back again.

In addition to the general charts showing the mean barometric pressure for a period of time over a large extent of the earth's surface smaller charts of localities, such as the British Isles, are issued that show daily changes.

On one of these charts, as in the annexed Fig. 1, some of the isobars may be seen in the form of rings, which are generally irregular, oval, or egg-shaped. If the innermost ring is very small, and there are several others packed more or less closely round it, the differences of pressure at neighbouring places will be large, and there will probably be a storm blowing where the rings are closest. In such a case, the barometrical reading represented by the innermost isobar will be the lowest on the map, and round that point the wind will blow, moving *against watch hands* or counter clockwise as shown in the diagram Fig. 1.

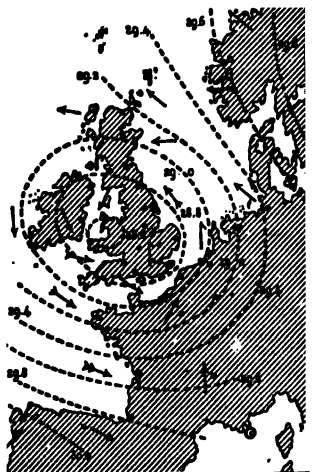


FIG 1. (CYCLONIC SYSTEM)

Such a distribution of barometer readings with its accompanying winds is called a "cyclonic system," a "cyclone" or a depression. The term cyclone is from a Greek word meaning to whirl round in a circle, as the wind appears to blow in a circle. The word depression refers to the fact that the barometer is low, the level of its column being depressed within the area affected by the system.

If the barometer reading, as in Fig. 2, represented by the innermost isobar, is the highest on the map, the system is called "anti-cyclonic," or an "anti-cyclone" as being the opposite of a cyclone. See annexed Fig. 2.

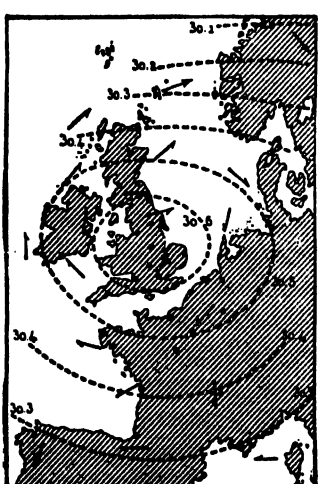


FIG 2. (ANTICYCLONIC SYSTEM)

In such a case the isobars always lie further apart than in the cyclonic systems; the differences of pressure are therefore slight, and the winds light. The winds circulate with *watch hands* or clockwise (as shown in the diagram), and therefore in the opposite way to what takes place in cyclones.

Anti-cyclones bring with them dry weather and clear skies. In winter they are usually accompanied by frosts, and frequently produce local fogs, but no clouds. In summer they bring fine weather, as there are no clouds to stop the sun's rays.

The only other points we shall mention are that cyclonic systems usually move comparatively rapidly over the country, in general from some westerly

point, never, or at least hardly ever, from an easterly point. Anti-cyclones move very slowly.

This fact of the motion of storms explains the law of "veering" and "backing" wind, which has already been stated. On the right-hand side of the track of a cyclonic system, that is on the southern side over our islands, the wind veers from S.E. through S. to W., and N.W., as the system passes by a station. On the left-hand side, or on the northern side over our area, the wind backs from S.E. to E. through N.E. to N.

In general whenever the barometer readings change slowly, there is very little danger of a storm, but when they change rapidly, there may be a sudden squall, or serious gale.

When the barometer at any place rises very high (above 30·5 inches), and continues so for some days, it will be due to the existence of an anti-cyclonic system, the wind will be light and the weather probably dry with local fogs, and in winter with frosts. When the barometer is very low (below 29·0 inches) and continues so, there may be calm and even dry weather for a short time, at the centre of a large cyclonic disturbance, but there is great danger of a serious storm, because there will be reason to expect the air from the region of higher pressure without to flow with violence into the district where the readings are low.

If the barometer rises gradually from a low level, the weather will usually become drier, and if it has been blowing hard, the wind will become lighter, or perhaps die away into a calm. If the barometer falls gradually from a high level, the weather will usually become damper, and there will be an increased probability of rain, though there will not be much wind as long as the barometer changes slowly.

A sudden rise of the barometer, after it has been steady for some time, is very nearly as bad a sign as a sudden fall, because it shows that the atmosphere is in a disturbed state. In an ordinary gale, the wind often blows hardest when the barometer is just beginning to rise, directly after having been very low. The direction of such gusts is generally from W.N.W. or N.W. direction in the British Islands.

With a rapid rise of the barometer in disturbed weather, severe squalls are common, though the weather generally improves quickly. Frequently, however, from the tendency of a succession of cyclonic disturbances to follow one another, such a rise is followed by as rapid a fall, when a ridge of high barometer readings passes away, and a new depression advances, and in winter beautiful weather and a rime frost are often experienced as the ridge is passing. This accounts for the

saying that a rime frost is a sign of bad weather. Such fine days between two storms are called "pet days" in some parts.

But the cyclone theory is of most direct importance to the seamen when in those regions which record tells us are peculiarly liable to abnormally violent cyclonic disturbances. These are the tropical zones, where the forces both of the earth's rotation and the sun's heat are most effective. These storms occur generally in the hot seasons when the seas in which they prevail come under the sun. They may be described as gales of great violence, turning round and rolling forward at the same time. The average rate of the progressive movement of their centres is usually between 200 and 300 miles in the twenty-four hours. They travel westward at first, then curve round towards the poles of the hemisphere they may be crossing, finally moving to the north-east in north latitudes and to the south-east in south latitudes. The tracks of these storm centres are shown upon the Admiralty Wind Charts.

Warned always by his barometer, and generally by the threatening aspect of sky, and troubled agitation of sea, the captain will know that the centre of the coming storm, or the region of the lowest barometer is probably about ten points of the compass to his right, as he stands facing the wind in the beginning of the storm, in the northern latitudes; and ten points to the left if in southern latitudes. But he has further to find out on which side of the storm's path the vessel lies. This important point is to be discovered by watching the way the wind changes or veers. Thus when north of the equator the wind will change round the compass clockwise, or in the same direction as the hands of a watch move, if the centre of the cyclone be passing to the right hand of an observer who is facing the direction from whence the storm is coming. The wind will change counter clockwise, or contrary to the movement of the hands of a watch, if the centre be passing the same observer's left hand. In the southern hemisphere these conditions are reversed.

In using the above rules, it is essential that the ship's position be *as nearly as possible stationary;* for if a ship continues her course the wind may shift in a direction exactly opposite to that which would have been observed had the vessel been stationary, and an erroneous conclusion as to her position in the storm would be drawn. The advisability of heaving-to on the first approach of a hurricane cannot therefore be too strongly urged.

The approximate position of storm and probable course of the centre having been thus determined:—

If to the right of the storm's path—

In the Northern Hemisphere—Carry-on, or heave-to on *starboard* tack.

In the Southern Hemisphere—Run, or heave-to on *starboard* tack.

If to the left of the storm's path—

In the Northern Hemisphere—Run, or heave-to on *port* tack.

In the Southern Hemisphere—Carry-on, or heave-to on *port* tack.

As a general rule, it is advisable to HEAVE THE VESSEL TO ON THE TACK ON WHICH SHE WOULD COME UP AS THE WIND SHIFTS TOWARDS THE STERN.

If, with the ship hove to, the wind continues steady in the same direction, increasing in violence, with a rapidly falling barometer, it may be presumed that the ship lies in the direct path of the storm's centre, and it will be necessary to run before the wind, keeping the wind, at all hazards, two or three points on the starboard quarter in the Northern Hemisphere, or on the port quarter in the Southern Hemisphere.

If the vessel be unable, from want of sea-room, to run, her position becomes one of great danger, and every precaution should be taken to prepare for the passage of the centre over the ship; for the steady wind will be succeeded by a short interval of calm, to be followed by a sudden and most violent burst of wind from the opposite point of the compass to that from which the wind has been blowing. After the calm the barometer will commence slowly to rise.

Speaking in the most general terms, the air flows *out from* the region of local greatest cold, and *into* the region of local greatest heat, because cold air is heavier than warm air, but it is modified in its flow by various agencies, among which the rotation of the earth on its axis, which imparts an eastward motion to the whole atmosphere, is the most important. It is to this cause that is due the deflection in the Northern Hemisphere of northerly winds to an apparent easterly course, and of southerly winds to an apparent westerly course; and by the combination of these tendencies the peculiar directions of the cyclonic and anti-cyclonic winds are also produced.

The general theory of the wind depends on two factors—heat and the earth's motion. The air near the earth's equator, being heated, and becoming lighter, gives occasion for a perennial inrush of heavier air from colder regions.

The heat of the equatorial districts causes the air there to become light and therefore to rise, while the air from the poles continually pressing towards the equator from the colder regions, forms, through the motion of the earth, the winds from the north-east or south-east, known as the N.E. and S.E. trades. On the other hand, the air rising from the equator, where it has acquired the velocity of the earth's surface in that region, moves towards the poles, and descending to the sea, becomes the westerly wind of the temperate zones. When the air drawn in the

northern hemisphere southward towards the equator meets the air carried northward from the southern hemisphere towards the same place, these two horizontal currents clash, counterbalance each other, lose their motion, and cause the calms, squalls, and variable winds known as the Equatorial Doldrums. Similarly, the hot air that rises from the equator, in descending to the surface of the earth, between the latitudes of 30° and 40°, as a south-west or north-west wind, meets and checks the motion of the cold air, rushing from north or south poles towards the equator, and thus forms, in both hemispheres, belts of calm and variable winds, known as the Calms of Cancer in the northern, and Calms of Capricorn in the southern.

Such is the general idea of the motion of our atmosphere; but there are endless local perturbations, the most marked being the "monsoons" or season winds of the Indian Ocean. The alteration in the temperature of the surface of the earth affects the atmosphere in a considerable manner. The sandy plain becomes more readily heated than the wooded hillside. The land and sea breezes of the tropics arise from the difference in receptivity of heat between land and water. Water is less subject to sudden changes of temperature than the land, but at sea there are distinct currents of cold and hot water. The Gulf Stream of the North Atlantic, and the Agulhas Stream off the coast of South Africa, bring great masses of water, warmed in the tropics, into the colder polar seas. The air is not only set in motion by these causes, but is also changed in character.

The wind systems of the Indian Ocean are much more complicated than those of either the Atlantic or Pacific. In the Indian Ocean, from the shores of Asia to the parallel of 10° S., in place of the north-east and south-east trades, with the intervening belt of calms which prevail in these latitudes in other parts of the world, periodical winds termed "monsoons" will be found, blowing from the north-east, south-west, and north-west, according to the season of the year.

In the Arabian Sea, Bay of Bengal, and China Seas, and as far south as the equator, a pleasant breeze like a trade-wind, from the north-east and north, prevails from November to March. This is known as the "north-east monsoon," and brings fair weather. This monsoon blows with greatest force in the China Sea.

From the equator to the parallel of 10° S., between the same months, the prevailing wind is from the north-west, generally light and uncertain, accompanied with squalls, heavy rain, and chequered by periods of calm. This is termed the north-west, or middle monsoon. To southward of lat. 10° S., the south-east trade will be found.

Between May and September in the same regions an entire change takes place, the winds now blowing fiercely from the south-west with rain and gales. In June

and July it is a continuous storm in the Arabian Sea and Bay of Bengal. This is called the south-west monsoon, and is the bad season of the year. The north-west wind, south of the equator, is replaced by the south-east trade, which extends nearly to the line, but falls light with frequent calms to the northward of 5° S., and between Sumatra and the meridian of Mauritius. April and October are the months of change during which the weather is uncertain and squally with frequent calms.

The Currents of the Indian Ocean run generally with the monsoons. In the N.E. monsoon the current in the Arabian Sea runs to the southward along the Malabar coast, and then sets to the south-westward, its velocity depending on the force of the wind. On reaching the African shore, this current runs along the coast at the rate of from one and a half to two and a half miles an hour, meeting, in about latitude 4° S., the northerly streams from Zanzibar; both streams then turn to the eastward, setting right across the Indian Ocean between the equator and the parallel of 70° S.

There is a general set of from one to two miles an hour to S.W. along the S.E. coast of Arabia, and into the Gulf of Aden.

In the S.W. monsoon the currents in the Arabian Sea are regular in direction, their velocity depending much on the force of wind and local circumstances. The general course of the current in the middle of the sea is about E., inclining to S.E. as it nears the western coast of India; its velocity varies from half a mile to two miles per hour.

On the eastern coast of Africa the current in the S.W. monsoon sets from Zanzibar along the coast to the N.N.E. at a velocity of two to four miles per hour, passes through the channel between Sokótra and the N.E. point of Africa at a rate of one and a half to two miles per hour, pursuing a course northerly and easterly, until it impinges on the Arabian coast about Ras Kosair, whence it takes a north-easterly course along that coast to Rás-al-Hadd, at a velocity of half to one and a half miles per hour.

CHAPTER XIII.

AUSTRALASIA.

PRELIMINARY SKETCH.—HISTORY.—DISCOVERY.—WESTERN AUSTRALIA.—SOUTH AUSTRALIA.—VICTORIA.—NEW SOUTH WALES.—QUEENSLAND.—TASMANIA.—NEW ZEALAND.—ZOOLOGY OF AUSTRALIA.—THE MARSUPIALS.—THE DINGO.—THE BIRDS.—THE EMEU AND CASSOWARY.—THE PARROTS.

THE farthest land to which the Orient steamships are bound, the destination of the great majority of their passengers, is that "new Britannia in another world"—the great island-continent of Australia, geographically included in the general term, Australasia. This is the true new world of the British race—no foreign conquest made by force of arms, or a plantation reared amidst an alien people, but a legitimate extension of the borders of England, possessed by a homogeneous British people, inheriting the laws, the customs, and the manners of the mother-country, and reflecting more faithfully the character of Great Britain than any other portion of her wide dominion. This is the newest England, the empire rising in the southern seas; a nation yet "in the gristle," but destined in the not distant future to lend new lustre to the glorious record of England's victories of peace. Here are provinces which have been added to the British empire without war or violence; a dominion not won by the sword or sprung through lust of territory; in whose bloodless annals there is no Cortez or Pizarro to stain his country's record. Our early conquerors have been the explorers, our sole battles those waged against barbarism and desolation. There is no ancient civilization to reproach us with its extinction; no people worthy to live which has been forced out of existence by our coming. The process by which the colonies of Australasia have risen has resembled rather a natural growth than a deliberate creation.

> "No workman's steel, no ponderous axes rung,
> Like some tall palm the noiseless fabric sprung."

Their life has been a little more than a hundred years. In that brief space has been crowded a story of successful, and not inglorious, though peaceful, adventure, which is remarkable, even among England's achievements in that kind.

Of this newest world in the south, James Cook is the true Columbus. He was preceded, of course, as all discoverers have been in every line—as the great Genoese was—by casual adventurers, who went to seek what they knew not, and found what they did not look for and could not value. Certainly as early as 1540—perhaps earlier—the coast of Australia was sighted by Portuguese navigators. In the old charts it was set down southward of the Moluccas under the name of *Great Java*, with very loosely defined outlines, except in one part of the north-eastern coast, which may, therefore, fairly be supposed to have been actually sighted, probably by the successors of Magellan on their way homeward from Java. The first extant chart other than in manuscript, which is of the date 1542, fixes the general position of the Australian mainland with tolerable correctness, and making the west coast end in latitude 35° S. Both the Spanish and the Portuguese are supposed to have known of the existence of a great southern island or continent, and even to have visited the northern and eastern shores, keeping their knowledge and their discoveries dark from jealousy of their commercial rivals. To the Dutch the honour belongs of making known the existence of the new world to Europe and to science. During the first half of the seventeenth century several Dutchmen coasted along the shores of the north, west, and south, sometimes landing, though generally content with viewing the shore from a distance, and naming the most conspicuous points.

In 1642 Abel Tasman discovered what is now Tasmania, taking it for the southernmost portion of the greater Java, going on afterwards to find and name the islands of New Zealand. In 1664 the country was formally named New Holland by the Dutch Government. Captain Dampier was the first Englishman to visit Australia in 1688, and after him followed Carteret and Hollis. But it was not until after the first voyage of Captain Cook, in 1770, that the world obtained any precise knowledge of the character of the great southern land. Cook, it is now proved, availed himself freely of the labours of his predecessors, but he remains the real discoverer of Australia, being the first who, by his courage, patience, ingenuity, and extraordinary fertility of resources, made the world actually acquainted with the nature and extent of the new continent, giving scientific form and definite shape to the rude outlines of the early navigators. The honour of adding a true knowledge of Australia in the geography of the world may thus be fairly claimed by England. It was some time, however, before Great Britain made any attempt to profit by the discoveries of Captain Cook; and more than half-a-century elapsed before the English claim to the new land was formally acknowledged. Attempts, which ended only with the first half of the present century, were made by other nations to acquire a foothold in the new discovered *Terra Australis*. Some failed through the timidity of the settlers;

others broke down through the incompetence or the failures of the commanders. A French party of colonists on the west coast fled in terror to their ships the first morning after their landing, scared by the loud croaking of the frogs, which they took to be demons. Another expedition declined settlement in a country where the natives were so unlovely of aspect. A third came away, pronouncing the country called Australia Felix unfit for human habitation. The most serious of these French attempts at colonization was that made in 1801, when three men-of-war, under Baudin and Freycinet, cruised about the southern coasts, looking for a likely spot for settlement, and finding none. In 1787, when the first step was taken by England to utilize the labours of Captain Cook, and to form a settlement in Australia, the enterprise was doubtless suggested by the despatch of *La Perouse*, two years earlier, by the French Government, to the South Seas; and when, in January, 1788, Captain Arthur Phillip landed on the shores of Botany Bay—the spot made classic by Cook's long stay, and Banks' scientific explorations—with the *Sirius*, and six transports and three storeships, it was with the view of forming a penal settlement for the convenience of British justice. He might have expected to find the French already settled on that coast, nor is there any evidence to prove that the British Government either were aware that it was then alone among the European Powers in New Holland, or that it claimed exclusive possession of the continent by reason of Cook's discoveries. Certainly King George's ministers never pretended to have founded a new empire, nor do they seem to have been aware of the importance of the step they had taken in the formation of the settlement at Botany Bay.

From these humble beginnings sprang the colony of New South Wales, the precursor and, in some sort, the progenitor of the Australian Dominion. Finding Botany Bay an inconvenient anchorage, and but scantily supplied with water, Captain Phillip speedily transferred the settlement to the shores of that splendid haven, but a few miles distant, which had so strangely escaped the notice of Cook. Here, within that spacious bay called Port Jackson, the most valuable gift of Nature to the Australian continent, the British ensign was hoisted in Sydney Cove (so called after Lord Sydney, an Under-Secretary of State), the spot which is now the centre and kernel of the busiest life in Australia, hereafter to be as sacred to the future Australian native as the Plymouth Rock is to the descendants of the passengers by the *Mayflower*.

For some years the progress of the young settlement was slow, and its health precarious. The country immediately round the shores of Sydney Harbour is infertile, and the infant colony, restricted to narrow limits, without means of labour

or faculty of extension, was more than once on the verge of starvation. The necessities of discipline rendered it impossible to penetrate into the interior. In 1790 General Phillip and his people nearly perished by famine through the loss of an expected store-ship, being still dependent for their supply of food from outside. In 1803 Bass' Straits having been discovered by the navigator whose name they bear, a branch settlement was formed in what was Van Diemen's Land, on the estuary of the Derwent, the site of what afterwards became Hobart Town, and is now Hobart. In 1808 the dull and sombre annals of New South Wales were disturbed by what was called the "Rum Revolution," a movement of which the resistance to the tyranny of General Bligh was the pretext, but of which the real motive was his interference with the monopoly of spirits enjoyed by certain favoured persons in the community. The advent of General Musgrave, a stern but capable ruler of honest instincts and enlarged views, was the beginning of a new era for New South Wales. He was the first to extend the bounds of the young settlement, and though cynically opposed to the free immigrant as having no business there, it was under his rule that the settlement began to assume the character and proportions of a colony. In 1813 Mr. N. C. Wentworth, the future statesman and *pater patriæ*, broke through the chain of the Blue Mountains, till then impenetrable, and led the way to the fertile country beyond. In 1831 the population of New South Wales, which then included all settled Australia, excepting Van Diemen's Land, was returned at 29,783. From that time forward the progress of settlement went on rapidly, with a few temporary checks, caused by local droughts or floods. Australia began to emerge from the condition which, as in the case of other famous empires, had been at once her reproach and the foundation of her greatness. To detail the rise and progress of each separate colony is not within the scope of our task. It is enough to say that as the country was made known by explorers, it began to attract the attention of immigrants of all classes from Great Britain. New settlements were formed along the eastern and southern coasts, which gradually developed into separate governments, which were either carved out of the territory of New South Wales, as Victoria and Queensland, or independently established by private enterprise, as South Australia. The two great epochs in the history of the free growth of the Australian colonies are marked by the discontinuance of transportation, which ceased entirely, to Van Diemen's Land in 1853, and the discovery of the gold deposits in New South Wales in 1851, from which time forward the advance of Australia has been "by leaps and bounds." The changes, even within the period—scarcely ten years—covered between the first edition of the *Orient Guide* and the present one, have been so great as to make what was then written ancient history. A decade of

Australian life is indeed as fruitful of incident and as prolific of growth as fifty years of Europe. Already we stand within the shadow of that crowning event which is to make all Australia one. The chapter of colonization is almost closed; to-morrow will open the page of a federal empire.

Taking the colonies in the order in which they are visited by the ships of the Orient Company, the first whose shores are sighted by the voyager from Europe, is Western Australia, the youngest and the newest of the Australian communities which have been endowed with the privilege of self-government; the smallest in population, but the largest in area, and perhaps the richest in resources. Although the coast was explored in the seventeenth century by the Dutch navigators, as some of the names of the headlands testify, and supposed to have been known to the English buccaneers from an early period, it was not until 1829 that Captain Fremantle, in the *Challenger*, brought the first batch of English immigrants to the Swan River, on the banks of which was fixed the site of the settlement of Perth, which is now the capital of the colony. For some years it was a hard struggle for existence. The colonists had no money, and for what they produced there were no markets.

In 1850 the settlers, reduced to the direst straits, petitioned the Imperial Government to make Swan River a penal settlement, and the Imperial Government were only too glad to send them what New South Wales would not receive. But what preserved the life of the young colony was fatal to its growth. The Government expenditure gave a temporary stimulus to the local trade and industry, but there was no immigration and no development. Western Australia was content to remain for nearly forty years as an appanage for the British penal system, the Cinderella among her more fortunate but not more richly endowed sisters. At last, in response to the aspiration after a new life, the Imperial Government was induced to grant to Western Australia what had been conceded to the other colonies. In the session of 1890 a bill was passed in the Imperial Parliament granting a constitution to Western Australia, with the privileges of self-government and control of the vast Crown property in land, similar to the other Australian constitutions. The new system was inaugurated on the 1st of January, 1891, and already there is a responsible ministry in being, with a budget and a loan and everything proper and peculiar to free government. The population is still exceedingly small, not exceeding 55,000, but it is rapidly increasing, and, doubtless, the stimulus which has been given to the colony by its accession to the full parliamentary dignity will attract settlers from outside. Already there has been a gratifying increase in all the returns from the productive industries. New gold-fields are being discovered and worked, and the exports show a steady process of

growth. Albany, the port where the Orient ships give the voyager his first impression of Australian scenery, has made especially large strides during the last ten years, and from its great capabilities, its important geographical position, and its selection as one of the points to be fortified at the expense of Federal Australia, it is destined to a great future.

The total area included within the colony of Western Australia is a little more than 1,000,000 square miles—an area exceeding that of all British India, and eight times larger than the United Kingdom. The greater portion of this vast territory is still unexplored, and it may be that a large portion of it is unfit for settlement. The northern districts, lying within the tropics, though among the richest in natural wealth, will hardly afford a field for the European labourer. Enough remains within the region suitable to the white man to make this perhaps the most important tract of land in the habitable world still open to European settlement, and fit to be the future home of many millions of Englishmen. The coast districts have been described as "one vast forest." The indigenous woods are among the most valuable known to commerce, including the famous *jarrah* (*Eucalyptus margurata*) and the *kari* (*Eucalyptus colossea*), which are reckoned as equal to teak in durability, and of finer and more various quality. The true sandal wood (*Santalum persicarium*) is included among the trees natural to the soil. But, as in other parts of Australia, there is scarcely anything, the product of temperate or tropical countries, which will not grow in some part or other of this magnificent territory. Water alone is wanted to make the soil fruitful, and a great part of the interior, it must be confessed, is still deficient in this necessary article. As for the climate, it is somewhat rougher than that of the eastern coast, the storms being frequent and violent in the north-west. On the other hand there are no hot winds, and the long droughts and heavy floods of Eastern Australia are here unknown.

The next colony visited by the Orient ships, after traversing the great Australian Bight, which washes that long strip of sandy waste known as the Victoria Desert, is South Australia. This is a peculiarly unhappy designation for this huge division of Australian soil, for it is not the most southern of the colonies, and it extends due north to almost the most northern point of the continent. About one-half of the area of South Australia is, in fact, within the Tropic of Capricorn. The northern territory, which was annexed to South Australia as a kind of reward to the South Australians for having explored it, can only be reached from Adelaide by sea for all practical purposes. South Australia itself, in its original restricted shape, was founded in 1836, under the auspices of a joint stock company called the South Australian Colonization Association. The principle of colonization adopted, and for

the first years of the settlement pursued, was that of Mr. Edward Gibbon Wakefield, an ingenious theorist whose schemes never succeeded, yet who, nevertheless, in promoting them did good service in the heroical work of plantation. The Wakefield theory, first tried in South Australia, was that all land should be sold at a high fixed price, the proceeds to be devoted to immigration—an ingenious theory, defective only in two points: first, that you should have a people willing to pay the high fixed price, and next, that having got it, you should spend it in immigration. In South Australia the first working of this scheme was most calamitous. A feverish thirst for land speculation created an artificial demand for land in excess of the legitimate wants of the settlement. At the same time, the colony was flooded with immigrants, who could not settle for want of means, and who could not sell what they produced for want of markets. Within these years the colonization scheme was brought to utter collapse, and the colony to the brink of ruin. Then came slowly the reaction with a healthier condition. Settlers were attracted by the substantial advantages offered by the territory, which was found to have agricultural resources immediately available beyond those of the older colonies. Up to the date of the gold discoveries, South Australia was the favourite colony of settlers of the better class, who sought not so much a fortune as a home in the southern world. The gold fever drew away a certain portion of her people to the neighbouring colonies, but in the end, although no gold was discovered, and has not yet been discovered, within her borders, South Australia profited largely by the increased wealth of her neighbours, and the rich copper mines of Burra Burra, Moonta, and Wallaroo proved almost as valuable to her as gold, and her agriculture received an extraordinary stimulus by the demands of the older colonies, so that in one year alone (1882) the sum of £2,250,000 was transmitted from Melbourne to Adelaide in payment for cereals, flour, and farm produce. In 1856 the colony was endowed with a constitution like the others, and since then its progress has been steady and uninterrupted. In 1860-62 Mr. A. M. Stuart made his famous journey through the heart of the continent from south to north, coming out on the shores of Clarence Straits in latitude 12° south.

The total area of the colony before 1863 was 380,000 square miles. Since the accession of the northern territory this area has been increased to 903,690 square miles, making South Australia the second in size of the colonies, about three times larger than New South Wales, and ten times larger than Victoria. Of this immense area, stretching from sea to sea, from the temperate zone to more than half way within the tropics, by far the larger portion is up to the present time unexplored and unoccupied. Much of the land hitherto regarded as desert, there is reason to believe,

will be found eventually fit for settlement, as the rainfall is stored and water provided by means of wells and dams. The climate of the southern territory is salubrious, and even within the tropics it is found to be less injurious to persons of European birth than other countries under the same latitudes, owing to the dryness and elasticity of the air and the freedom from malaria. The principal river of the continent, the Murray, runs the latter part of its sluggish course within South Australian territory, emptying itself in Lake Alexandrina. Other natural features are lakes, chiefly salt, in the interior, of which one, Lake Eyre, receives the drainage of a vast region, extending on one side far into Queensland and New South Wales. These large internal surfaces of water, peculiar to South Australia, tend to temper the aridity—which is the chief characteristic of the South Australian climate. The total population at the last census in April, 1891, was 315,048, exclusive of aboriginals, whose number is steadily declining.

The smallest of the Australian colonies on the continent, Victoria, favoured by its geographical position, its mineral wealth, the superior quality of its land, its temperate climate, and the enterprise of its inhabitants has, hitherto, taken the first place in colonial history, having the character of being the most enterprising and "go-a-head" of all the colonies; how long it will maintain this distinction, due chiefly to the rich auriferous deposits lying at a convenient distance from the ports, remains to be seen. Melbourne, the largest city in the southern hemisphere, and the principal centre of Australian commerce, is one of the most important of the places visited by the Orient steamships, being the point where the traffic radiates to Tasmania, to New Zealand, and to Oceania. In many respects it may be reckoned the metropolis of the southern world, having more the character of a capital than any of its competitors, though inferior to Sydney and to Hobart in beauty of site, and in capacity of harbour accommodation.

Victoria, once the Port Phillip District, the Australia Felix of the old maps, has been carved out of New South Wales, having commenced its separate existence as a colony in 1851. Its total area is not more than 87,884 square miles, or about the same as Great Britain, its extreme length from east to west being 490 miles, and its greatest breadth 240 miles. A larger proportion of this territory is available for cultivation and settlement than in any other Australian colony, owing to the greater fertility of the soil, and a climate better suited to the European constitution. The most southerly point of Victoria is a little south of 39° south, bringing a portion of the territory within a zone cooler than any part of the Australian mainland. The isothermal line of Melbourne, in latitude 37° 50', corresponds with that of Marseilles, Nice, and Madrid in the northern hemisphere, though the range of temperature in

the Victorian capital is not nearly so great as in any of those cities. The thermometer sometimes exceeds 100° in the shade, the greatest heat recorded being on the 14th of January, 1862, when the mercury rose to 111°, but on that day there was a bush fire raging in the vicinity. The east winds are more disagreeable than unhealthy, never lasting beyond the third day, and contributing no little, according to the best authorities, to the extraordinary salubrity of the Victorian air. The lowest recorded temperature in Melbourne during 27 years is 27°. Frosts are not uncommon in winter, but snow has only been known to fall once in the memory of the oldest inhabitant, though no rare phenomenon in the interior, and especially in the high lands of Northern Gippsland. Mounts Kosciusko and Feather Top, the highest points of the Australian Alps, rising to nearly 7,000 feet, are wreathed in eternal white. The principal mountain range runs across the colony from east to west, rising to a higher elevation eastward, and possessing a greater variety of climate than is usual within the same area in any part of Australia. The coldest month is July, the hottest January. The mean temperature of the year is about 57°. The average annual rainfall is 26 inches, but is subject to much variation. All the Victorian rivers, which have the rare distinction of being mostly running water, have their source in the dividing range, those rising to the north flowing into the Murray, and those to the south into the sea. There are several lakes, of which Corangamite (salt) is the largest. In Gippsland is a chain of salt water lakes, only separated from the sea by a narrow belt of sand. The principal bay is Port Phillip, which is forty miles from the Heads to Hobson's Bay, the port of Melbourne, and includes Corio Bay, on which Geelong, a former competitor with Melbourne for the commercial leadership, is situated.

The rise of Victoria during its forty years of independent existence is a phenomenon perhaps the most marvellous of that kind which has ever been recorded. There are men now living who have fed sheep in what are now broad streets, teeming with life and trodden by tens of thousands of busy feet. The latest returns seem to show that Victoria, which for many years had taken the lead, is now falling a little behind New South Wales in the race, a fact which is no derogation from the superior enterprise or attractiveness of the younger colony, seeing that its rival is more than four times larger in territory. By the census of April, 1891, the Victorian population was 1,140,405, including about 8,700 Chinamen and aborigines.

Perhaps less importance may be attached to a return put forth by Mr. Hayter, the Government statist, showing the wealth of Victoria as compared with the other colonies. According to this flattering estimate, Victoria is rich to the extent of

£407,284,000, while the citizens of New South Wales possess but £332,446,000. These figures are disputed, however, by Mr. Coghlan, the New South Wales statistician, who reverses the amounts, making his own colony the richer. However this may be, and it is obvious that any process of comparison depending upon calculations of private wealth, upon the basis of the value given by the possessors themselves, must be liable to many causes of error, it is certain that Victoria, in spite of a temporary depression, is, on the whole, a rich and prosperous state, which only wants good and honest government (nor too much of any) to retain a high place among the communities of Australia.

The last colony to which the Orient voyager is brought is New South Wales, the oldest of the Australian communities, with a more settled and distinctive character by virtue of its longer existence and its picturesque and varied history. The territory, though shorn of its ancient handsome dimensions by the loss of Queensland in the north and Victoria in the south, still includes an area of 310,937 square miles, which is half as large again as France, going up to the 29th parallel in the north, and touching Victoria in the south. The Blue Mountains, which run almost parallel to the coast at a distance ranging from 50 to 100 miles, are the chief natural feature of New South Wales. From their western slopes run the streams which form the Murray, the greatest of Australian rivers, with a total course of some 2,400 miles to the sea. The Murrumbidgee, the principal feeder of the Murray, has a course of 1,350 miles, all within the New South Wales border. A great part of the interior is sterile and waste, but much has been done lately by artificial means, by the sinking of wells and the damming of the river courses, to increase the supply of permanent water, to the great benefit of the agriculturalists and the graziers. Some of the land watered by the rivers flowing eastward, as about Illawarra and Shoalhaven, is of extraordinary fertility, with native vegetation of tropical luxuriance. The ordinary aspect of the bush—both here as over Australia generally, meaning rolling plains, scantily grassed, with trees scattered here and there, as in an English park, without undergrowth—is monotonous and dreary. The eucalyptus, in its common forms of red gum, white gum, and stringy bark, is everywhere—a tree without verdure and without shade. The mimosas, which are found in next great plenty, are more pleasing from their greater variety of form and colour, and many of the indigenous flowering shrubs, such as the warratah (*Teleopea speciosissima*) and the gay and quaint Banksias, lend variety to the landscape and richness to the ground. There is much diversity of climate, as of soil, in New South Wales, from the humid semi-tropical heat of the Clarence to the bracing cold of the southern table-lands. The summers are long and dry, with now and then a hot wind from

the north, followed by a "brick-fielder"—a dust storm, prefacing a change of wind and a fall of the thermometer. Sydney in June, which is the Australian December, is Elysium. For eight months out of twelve, at least, it is impossible to enjoy a climate more delightful. As for the harbour, it is the one great natural show of the colony. Given a greater luxuriance of greenery on the banks, a more fertile soil, and more varied elevations, Port Jackson would rival Rio de Janeiro or Naples. For amplitude of harbourage, accessibility, and position, it is, perhaps, unique as a seaport, giving to New South Wales a singular advantage over all her rivals. Nearly all the trade of the colony with the outside world is carried on through Sydney. The amount of shipping entering the port every year is more than double that of London fifty years ago. The total value of the exports and imports—now nearly balanced—is now £45,000,000 sterling, a figure which in the future we may expect to be somewhat diminished, as, for the first time in her history, New South Wales, the one especial free trade colony, which owes so much of its commercial prosperity to the fiscal blunders of its neighbours, has lately adopted the policy of protection—even protection against her sister colonies.

The population of New South Wales at the census of April, 1891, was 1,132,237, including 14,156 Chinese and 8,280 aboriginals. Since then the patriotic calculations of Mr. Coghlan, the Government statistician, have fixed the population of New South Wales at 1,165,000, making it some 7,400 over that of Victoria. Favoured by her larger acreage New South Wales is able to feed a much greater number of cattle and sheep than her neighbour in the south, it being now estimated that she possesses 2,000,000 of horned cattle and 60,000,000 of sheep, besides 500,000 horses.

Although Queensland is not reached by any of the Orient steamships, a great many passengers are conveyed to Sydney *en route* for that colony, and many more are likely to avail themselves of this cooler, pleasanter, and speedier route. The youngest born of all the Australian settlements, Queensland has advanced with rapid strides to a front place among the most prosperous of the colonies. Up to 1859 it was part of New South Wales, governed by a resident magistrate under the name of the Moreton Bay District, and possessed by a thinly scattered race of pasturalists. There, as elsewhere, the pioneers of settlement and civilization; there, the "shepherd kings" of a subsequent date, during the evil days of 1842, were driven to retailing their legs of mutton at the settlement to make a living. Some of the more timid believed that their cup of disaster was full when gold was discovered in the south; but it was from that date that Queensland has "steadily risen" into prosperity. Endowed with a separate existence in 1859, and a territory embracing

the whole north-east of Australia nearly up to lat. 10° S., and conterminous with the frontier of South Australia on the west, Queensland has an area of 668,497 square miles, being the third in size of the Australian colonies. She is now the third also in population, which by the last census was 393,863, exclusive of aboriginals. The people are divided into the pasturalists and all who live by them, the gold-diggers, the sugar-planters, nearly all confined to the Mackay District, and the heterogeneous population of the towns.

The smallest of the Australian colonies, Tasmania, formerly Van Diemen's Land, is one of the most beautiful and healthful countries of the world, blessed with a climate perhaps the most perfect of any in the southern hemisphere, uniting the fineness of the Australian air with less heat in summer and a lower mean temperature. The passenger by the Orient steamer reaches it from Melbourne, from which port there is frequent and regular communication with Hobart and Launceston, the two chief towns of the island, now united by a railway running north and south. The island is about the size of Ireland, with an area of 24,330 square miles. The strait which divides it from the mainland is about 120 miles across. Physically, it is a portion of Australia, the fauna and flora corresponding to those of the opposite continent, with a few new forms developed by its more southern position. The general aspect of the island scenery is more agreeable than that of Australia. There is more verdure and more moisture, more to remind the Englishman of his own country. The products of the island are precisely those of England—English trees and fruits and flowers growing here in greater luxuriance than even at home. It is a country of the apple and pear and gooseberry rather than of the grape and peach, and nowhere do the fruits of the temperate zone attain to such perfection. The sweetbriar is even so much at home as to become a nuisance, like the thistle in Australia, attaining to gigantic proportions. The geranium is used to make hedges five or six feet high. There is no more to say of Tasmania than that it has a population, slowly increasing, of 152,000.*

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* Australian and Tasmanian fruit, although long well known in England and in English ships trading to the Antipodes, might be better understood by the producers. No doubt, where labour is scarce or dear, it is not easy to make a profit by exporting such perishable wares. The time when Australian apples command, or may command, the English market, is, of course, when English apples are getting "sleepy." It scarcely pays market gardeners to take the trouble of keeping one crop until another comes in; for, although it is not difficult, the constant picking over involves an amount of labour which rapidly absorbs the profit. If Australian growers could step in at this conjuncture it would relieve, and not injure, the interests of the English dealer.

The principal points to attend to in sending apples from Australia are, first, the packing; and secondly, the selection of suitable kinds. As to the first, it is worth while to observe that every apple in the slightest degree bruised should be rejected at once. One bad apple will spoil all the others that touch it. If possible, the stalk should be preserved whole. The fruit should not be rubbed. A kind

The islands of New Zealand, though classed under the general term Australasia, do not belong in any true sense to the Australian system, and, as being outside the sphere of the Orient enterprise, need not occupy us long. A thousand miles of ocean flow between Australia and New Zealand, making the latter more purely insular than any island in our globe. Although the direct line across the Pacific and the American continent is the shorter, the high road to New Zealand is likely to continue to be, for passengers at least, by the eastern route, which is not only more attractive and interesting, through the variety of countries and seas which are traversed, but has this further claim on the English traveller, that every station and every stage on it by sea is either British or under British influence. New Zealand, as a country, has no features in common with Australia. The animal and vegetable forms are wholly distinct, and the aspect of the scenery entirely dissimilar. In New Zealand are no marsupials, and of mammals it is doubtful whether there are any indigenous except the bat. Of the birds, including the now extinct dinornis, the greater part are peculiar to New Zealand. Of the flora, two-thirds of the species exist nowhere but in these islands. The climate, again, is very unlike that of Australia; perhaps healthier and better suited for the perpetuation of a British race in its purest type, but certainly less agreeable, more equable, more humid, and more boisterous. The Northern Island is like a milder Devonshire, with less rain, more sun, and more wind. In the South the fogs and frosts are sometimes severe. The mean temperature of the North Island for the year is 58° 3′; of the Middle Island 52° 1′. In area New Zealand is about equal to the British Isles, resembling them in all natural features, as we trust it will continue to resemble them in every other respect. There are three principal islands, of which the Middle is by far the largest, with a lofty range of mountains attaining to a height of twelve or thirteen thousand feet, running close along the western coast, whose fiords and inlets exhibit scenery of the most sublime and romantic character. The North Island is the more fertile, and contains in the interior a system of volcanoes, more or less active, with the famous lake country, the wonderland of New Zealand, with its boiling springs and terraces, which were pink until blackened by the late explosion of Tarawera. In

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of natural oil exudes from the skin, and helps to preserve it from the air, on the same principle which advises us to butter eggs. Greengrocers make a great mistake when they polish their apples, to make them look attractive, as it injures their keeping qualities. Each apple should be wrapped in paper. Close packing, to prevent bruises, or shaking about, is very desirable. The best early apple for export is, perhaps, the Scarlet Permain. The Sturner and New York pippins are always very welcome as dessert fruit on board ship, and carry well, the pippin, indeed, being the better of keeping till the skin is slightly shrivelled, when the flavour seems to become more concentrated. For cargo apples, such as are most useful in the kitchen, there is nothing better than the French crab, unless it be the Wellington. This is a branch of trade certain to increase, and well worthy of a little attention and care at the outset.

future years this will be the haunt of travellers in search of health and of novelty, when a voyage to New Zealand, with a visit to the baths of Rotomakana and Rotorna, will be the crown and finish of the ocean adventure begun at Tilbury.

The visitor to the island continent is frequently reminded of the great difference that exists between the zoology of this new, but geologically ancient, land and that of the country from which he has come. The animals native to Australia are of an earlier type than those which survive on our own shores, and it is likely that in what geologists call the tertiary age, and later, Australia had a much greater number of large animals than it has now, but all of them had the pouch, and all were comprised under one or other of two great classes. They are all described by scientific naturalists as either *Diprotodonts* or *Polyprotodonts*. It will be well to get accustomed to those two names, because between them they sum up nearly all Australian native animals. The echidna and the platypus have no teeth, and the teeth of the dingo and the flying foxes differ from those of the two other divisions of the great Australian family. As it is easier to remember names when we understand their meaning, we may explain that all naturalists of the present day divide animals by the number and arrangement of their teeth, and that it was found that certain marsupials had many front teeth, and were to be placed in the division which bears a name from three Greek words pronounced "poly-prôt-odont," and signifying "many front teeth." It was found, further, that a much larger division had but two front teeth, and were to be placed under the name of "di-prôt-odont." It was further found, again, that these "two-front-teeth-animals" were all vegetable feeders, while all those which had many front teeth were flesh eaters. When we read of Sir Richard Owen that if you showed him a tooth he could restore the whole animal, we know that this is one of those exaggerations which inculcates a truth. Owen would probably have seen that the tooth belonged to some marsupial, to a Polyprotodont or a Diprotodont, and would have judged accordingly whether the animal to which it had belonged was, say, an American opossum or an Australian kangaroo. The fossils of Australia show us that, at no very remote period, the bush was peopled with wombats bigger than a short-horn bull, and with three or four now extinct types of the Thylacinus or Tasmanian wolf. Stranger still, remains of fossil marsupials have been found all over America, at many places in England, and also in Germany. All these remains belong to the same tertiary and later geological period: the difference being that, whereas they have wholly died out in Europe, they are abundant in Australia. America can still boast of some two dozen species of opossums, but the number of species of marsupial animals of all kinds now existing in Australia and Tasmania exceeds one

hundred and thirty. The wonder with which their first discovery was received is recorded in the delightful pages of Sydney Smith:—"In this remote part of the earth, Nature (having made horses, oxen, ducks, geese, oaks, elms, and all regular and useful productions for the rest of the world) seems determined to have a bit of play and to amuse herself as she pleases. Accordingly she makes cherries with the stone outside; and a monstrous animal, as tall as a grenadier, with the head of a rabbit, a tail as big as a bed-post, hopping along at the rate of five hops to a mile, with three or four young kangaroos looking out of its false uterus, to see what is passing. Then comes a quadruped as big as a large cat, with the eyes, colour, and skin of a mole, and the bill and web-feet of a duck, puzzling Dr. Shaw, and rendering the latter half of his life miserable, from his utter inability to determine whether it was a bird or a beast."

More concise and scientific, if less amusing, is Mr. A. R. Wallace's note on the fossil animals. "The extinct species all resemble, in general character, those now living in Australia, but, as in most other countries, many of these recently extinct animals were of enormous size. One of the kangaroos was fully a third larger than any living species, while the diprotodon, a huge thick-limbed animal, allied to the kangaroos, was nearly as large as an elephant. An extinct wombat was as large as a tapir, while the nototherium, a creature intermediate between the wombat and kangaroo, equalled in size the living rhinoceros."

It may be worth while to examine more closely a very few typical examples of these singular Australian animals, so that when we visit the Zoological Gardens at Adelaide, Melbourne, and Sydney, we may know what especially to observe as interesting and rare. At each place we should supplement our observations in the gardens by a visit to the museum—indeed, in some particulars, such as examples of monotremes and of the curious marsupial mole, notoryctes, the museum at Adelaide is even more interesting than its zoological garden.

Let us begin with the monotremes, sometimes called edentata, or toothless. Two examples only are known. The name of *Ornithorhyncus anatinus*, which signifies, somewhat awkwardly, "the animal like a duck, with a bird's bill," has been given to the water mole, sometimes also called the platypus, a reference to its flat webbed feet. It is about two feet long—the female much smaller—with close velvety fur, nearly black, and a flat beak like that of a duck. Its feet are broadly webbed, but the soles are flat and bare. The *Echidna*, or native porcupine (*Echidna aculeata*), is rather smaller, and has coarse spines of stiff hair on the back, and a narrower beak, slightly turned up at the end. A variety of the species has been found in New Guinea, with longer hair and shorter

spines. These curious creatures "comprise," says Mr. Ogilby, "the lowest, and in point of time, the most ancient types of mammalian life." They lay eggs. The eggs of the ornithorhynchus are laid in a nest in its burrow, and hatched by the warmth of the parent's body. The echidna, on the other hand, has a better developed pouch, in which the eggs are placed and carried about until the young are hatched. It is not gifted like the water mole with webbed feet, and seems to be much less aquatic in its habits, feeding chiefly on ants. It has the long thin tongue observed in other ant-eaters. The ornithorhynchus eats water insects and shell fish. Both these little animals have colder blood than fully formed mammalians in general, that of the echidna standing only at about 78°, or 20° lower than man, and



30° lower than birds, and some naturalists are inclined for this and other reasons to compare them rather with reptiles than with birds. Whether the next marsupial on our list has the same *sang froid* I cannot tell. It is, however, in other respects as wonderful as any creature yet found in Australia. Having only been discovered last year very little is known about it. This is the sand mole, a small sand-coloured, burrowing animal, about six inches long. It was first observed by Mr. Bishop, a settler at Idracowra, a place situated in the very centre of Australia. Subsequently Mr. Benham, also a settler in this region, sent a specimen to Adelaide, where it was received with much curiosity and attention. Finally, Dr. Stirling, who accompanied Lord Kintore on his famous

journey across the continent, specially enquired for it, saw Mr. Benham, and received several specimens from him. Mr. Benham told him furthermore that he had kept an *Oor-quámata*, as the natives called it, for some time, but that it died, apparently of fright in a thunderstorm. He also told of one that being set on the bare ground it instantly burrowed its way under the surface with such rapidity as to elude the most instant and careful search. No wonder, we are told, that the natives regard it with superstitious awe. Dr. Stirling bestowed on it a Latin, or, to speak more accurately, a Greek name, which seems another example of the practice noticed above, of giving the longest names to the shortest animals. However in the words *Notoryctes typhlops*, we have a notice of the little creature's most remarkable peculiarities. It has no eyes. There are rudimentary eyeballs buried under skin and muscle, and there are rudimentary optic nerves, but they do not even join the eyeballs. There is but one other blind mammal known, a kind of mole found in South Africa. Nor is this all. We observed that the greatest peculiarity of the echidna and the water mole was the beak. The sand mole has peculiarities in the number, kind, and arrangement of the teeth which are noticed by Dr. Stirling and Mr. Ogilby, and which, though they can hardly be discussed here, go to prove that the animal is a connecting link between the monotremes and the ordinary marsupials, and this view is confirmed when we observe the horny covering or beak at the end of the nose, which, with the strong claws, is used in burrowing. One more peculiarity is in the position of the pouch, which opens down and not up, as is the case also with other burrowing marsupials. If the pouch opened as it does in the kangaroo, it would constantly scrape up sand, to the great inconvenience of the inmates. A specimen of the notoryctes is exhibited now at the British Museum, and we may hope before long to know more about it. Professor Huxley and others have classified all mammals as Prototherial, Metatherial, and Eutherial. To the first class belong the echidna and the ornithorhyncus only. To the second are referred all marsupials. The third class consists of men, cats, dogs, horses, and all the other ordinary animals of Europe, Asia, and Africa. To which of these classes does notoryctes belong? Mr. Ogilby puts him among the Metatheria, and he is probably right, but he may be wrong. We shall know when we find out whether the sand mole lays eggs or brings forth its young alive, and when we have taken its temperature.

We may turn now to the larger and better known of the Australian marsupials with "many front teeth." Among them the most interesting are those which in appearance and manner seem to imitate the beasts of prey in other lands. The three most important are known scientifically by Greek names, *Thylacinus*, which

means simply, furnished with a pouch; *Sarcophilus*, which means fond of flesh; and *Dasyurus*, which means rough haired. All three belong to the family *Dasyuridæ*. They are all formidable animals, and the estimation in which they are held by the colonists may be gathered from such names as "devil," "wolf," and "tiger," which are commonly bestowed upon them. *Thylacinus cynocephalus*, the dog headed, is now only found in Tasmania, where it is called the wolf. Very like a wolf it is in some respects, and still more like a large jackal, but it has vertical stripes on its grey-brown coat. The pouch, unlike that of the kangaroo, is directed backwards, and is found on the male animal as well as the female. It is very destructive in its habits, and almost, if not quite, untameable. The Tasmanian Devil (*Sarcophilus ursinus*) owes its likeness to a bear to its thick close fur, "consisting largely of the soft woolly under fur," and to its flat, plantigrade feet. It also has, and deserves, a very bad character. Next on the list is the large cat-like Dasyure, which the first settlers called the spotted martin (*Dasyurus maculatus*). Like the last named it has its pouch directed backwards, but unlike it is as well known on the continent of Australia as in Tasmania. Mr. Thomas remarks on the fact that this comparatively small island should be able to support in considerable numbers the three largest carnivorous marsupials; but according to Mr. Ogilby, he is wrong in thinking that the dasyure is approaching extinction. The three animals just mentioned render themselves notorious and obnoxious wherever they come, owing to their predatory habits alike among sheep and in poultry yards. Mr. Wallace says of the thylacinus, "It is exceedingly bloodthirsty, and commits great havoc among the flocks of the settlers whose farms lie near the wooded mountains in which it dwells." Of the sarcophilus, he remarks, "It is black with white patches, and considering its smaller size, is even more destructive than the thylacinus, and is exceedingly savage and untameable. It was formerly very abundant, and destroyed great quantities of poultry and sheep, but having been persistently hunted and trapped is now getting scarce in most districts."

Of other flesh-eating "many front toothed" marsupials are the *Phascologales*, or pouched mice, of which some twelve or thirteen kinds are enumerated; the *Peragales*, or bandicoots, of which there are many kinds, and the *Myrmecobius*, or ant-eater, which is interesting as being most nearly allied to the marsupial animal found fossil in England. "To it," says Mr. Ogilby, "the resemblance is so close as to suggest that the Australian example is actually an unmodified survivor from Mesozoic times." Mr. Thomas makes a similar remark. It may be worth while here, before we turn to the vegetable eaters, the "two front toothed," or diprotodontic animals, to say expressly that there are no opossums, properly so termed,

in Australia. This can be made clear in a moment to anyone who has learnt his lesson about "many front teeth" and "two front teeth." The American opossum has many front teeth, and eats animal food. The creature misnamed an opossum in Australia is really a phalanger, has but two front teeth, and eats vegetables.

The vegetable-eating marsupials are much more numerous than the many front toothed animals we have been describing. There are more than twenty kangaroos, eleven wallabies, one tree kangaroo, one musk rat, eight kangaroo rats, one koala, thirty phalangers, and three wombats. All of these have similar characteristics, all bring up their young in pouches, and it will only be necessary to describe two or three out of the whole list. It would be very convenient to the naturalists if they could more sharply define the various genera, but, as Mr. Thomas remarks, the characteristics by which they are separated are not sufficiently constant. The word kangaroo is found in the language of Western Australia, where the female animal is called kangaronga, or *yangorgnanga*, which means "mother of the kangaroo." Naturalists call the animal *Macropus*, a name which refers to the great feet on which it hops. Its habits are described by Mr. Thomas very briefly. It is "terrestial, saltatorial, graminivorous." The great grey kangaroo, which is such a familiar object in all menageries, is about as tall, when standing up, as a tall man, and bears, in the books, the descriptive name of *Macropus giganteus*. Its strong thick tail seems to act like a spring when it jumps, and everyone who sees such a sight, except the victim, perhaps, is struck with wonder and pleasure at the apparition of three or four ghost-like kangaroos sailing serenely in the moonlight over the highest orchard paling, apparently without an effort. These large kangaroos are hunted with dogs bred for the purpose, and run, not in packs as we see them in so many pictures, but singly or in pairs. The kangaroo at bay is a dangerous animal, using the long sharp nail of the middle toe as a formidable weapon.

The wallaby, though much smaller, differs otherwise very little from the kangaroo. The various rats need not be described. The little marsupial jerboa (*Antechinomys laniger*) is only three and a half inches long, with a tail of five, and though it leaps like a miniature kangaroo, it is insectivorous in its habits. The *Koala*, or native bear (*Phascolarctus cinereus*), on the other hand is "graminivorous," and as it is three feet long, very stout and clumsy, with thick, woolly fur, it is wonderfully like a small bear. Some of the phalangers are commonly called opossums, but are all vegetable eating animals; as is, also, the flying squirrel, or *Petaurus sciureus*, a beautiful little creature. The wombats, in many respects, resemble the koala. They are stout and clumsy, with thick, strong legs and the tail

rudimentary. The common wombat (*Phascolomys mitchelli*) is forty-four inches long, and will eat fruit, grain, leaves, grass, and sometimes—that is, when he can get them—insects and honey.

Such are the marsupials of Australia. There are a few quadrupeds left which do not come into that category: but though they have no pouches and are not "saltatorial," and do not lay eggs, they are almost as curious, as interesting, as much out of the common, as any of the others. First come the dingoes. There is another native name for this dog, warrigal. Of late years the dingo has become rather scarce, as his services in keeping down kangaroos were more than recompensed by his predatory habits among flocks of sheep. For a long time it was thought that he had been brought to Australia by early settlers, or by the first inhabitants. Mr. Wallace thinks (*Australasia*, p. 53) it is not truly indigenous, but, geologically speaking, a recent immigrant. On the other hand, he puts the opposite argument very strongly. It is difficult to understand "how such an animal could, without assistance, have arrived in the country except by means which would have equally admitted the entrance of many other animals." Mr. Ogilby is of this opinion too, and quotes Mr. McCoy to show that the dog is really one of the most ancient of the indigenous mammals of the country and abounded as now most probably before man himself appeared. The discovery of fossil dingoes in the pliocene tertiary strata, together with bones of diprotodon, thylacoles, and other extinct animals, should be conclusive. As to his habits, they are almost too well known, but Mr. McCoy remarks on his aversion to domestication, also on the fact that he is, or was, abundant in every part of Australia, and that the further you go from human haunts the more numerous do the dingoes appear.

The other group of animals, without pouches, to which I made allusion above, as belonging entirely to the Eutherian class, is almost as much to be reckoned among the many wonders of this wonderful country as any of the Metatherians. Everywhere, except in Australia, the Prototheria and Metatheria are largely outnumbered by the Eutheria, but here, where we have only seventy different indigenous species of animals, not one, as Mr. Ogilby remarks, is of commercial importance. The sheep, the horses, the cattle of all kinds which now swarm over the island-continent, are all imported, and have their origin in far distant lands. The most interesting native animals then, which are not marsupial, are the flying foxes. There are many kinds of bats, some very large and some very small, but they do not so very much differ from the bats of other lands. The fruit and flesh-eating flying foxes are nearly unknown elsewhere. They are described as among the greatest pests of the Australian settler. They fly in flocks, and will completely

strip an orchard in a single night. They exhale a disagreeable odour, and the stench of one of their rookeries is almost unbearable. "In these camps," says Mr. Ogilby, "they may be seen by thousands on each tree, hanging head downwards, quarrelling for the best places, keeping up all the while an incessant chattering or bickering *inter se;* and so great are their numbers that frequently large branches are broken off by the mere weight of the clinging bats." Some are as much as a foot long, with a spread of fourteen or fifteen inches in the wings. Most species live on fruit, but some are "sanguinivorous and carnivorous, feeding not only on insects, but also on smaller kinds of bats, and other small mammals." One of the tribe bears the disagreeable title of "Great Blood Sucking Bat," and would appear to be the originator of the horrible legends of vampires we have all met with.

The birds of Australia comprise a large number of different species, and as with the mammals, their forms are strange and unexpected. Just as among the quadrupeds various European animals are represented by similar marsupials, and we have marsupial wolves, cats, bears, and so on, among the birds our pheasants and partridges are represented by ground parrots, the ostrich of Africa is represented by the cassowary, the gallinaceous tribes by the brush turkey, while among the curiosities may be reckoned birds of Paradise, laughing kingfishers, piping crows, bower birds, lyre birds, honey suckers, and black swans. Several species are represented in the Zoological Gardens in Regent's Park, where a large collection of parrots, about nine-tenths of them from Australia, may be seen. In Adelaide there is a very good collection including some of the more delicate parrakeets, which we can scarcely expect to meet in England. The collection of parrots skins in the Adelaide Museum is extensive and probably unique. At Melbourne the native birds are well represented in the Zoological Gardens, and rare birds may often be seen among the hundreds of specimens offered for sale in the market in Burke Street. Sydney also has its Zoological Gardens, which are well worth a visit.

As it is desirable to obtain, if possible, clear views on such subjects as this, we may assume that everyone knows that macaws are not found in Australia. Their place is taken by the more soberly-clad cockatoos. So, too, there are no conures as in South America. Instead, Australia has her lovely parrakeets. The true parrot, again, like the African grey parrot, or the Brazilian amazons, is a stranger, the lories and ground parrots playing the same part. Of other birds the pigeons come in for a large share of notice. Twenty-one species have been found in Australia, some of them of remarkable beauty of plumage, especially the crowned pigeon (*Goura coronata*), whose chief habitat, however, is New Guinea, as it is of birds of Paradise. The bower bird (*Ptilonorhynchus violaceus*) was first

described by Gould. It is dressed in black but glossy satin, but the most remarkable thing about it is the "bower" from which it derives its name. "Long before the construction of their nest, and quite independently of it," says Mr. Sclater, "they with consummate skill, weave with twigs firmly planted on a platform of various materials, an arbour-like gallery of uncertain length, in which they amuse themselves with the most active glee. They pursue each other



through it; they make attitudes to each other, the males setting their feathers in the most grotesque manner, and making as many bows as an ancient cavalier in a minuet. The architecture of the bower is excessively tasteful, and the ornamentation of the platform on which it stands is an object of constant solicitude to the birds. Scarcely a day passes without some fresh arrangement of the shells, feathers, bones, and other decorative materials, which they bring from long distances

in the bush for this purpose, and of which they immediately appropriate every fragment placed within their reach when in confinement."

Another strange Australian bird is the *Dacelo gigantea*, a kind of large kingfisher, in very plain plumage, and remarkable for its note, which is extremely loud and disagreeable, and has earned for the bird among the colonists the name of "Laughing Jackass." It avoids water, but eats small animals and especially mice,



CASSOWARY.

which it catches very cleverly. It is therefore something of a favourite in the Australian farmstead.

The Australian ostrich, or emeu (*Dromœus novæ hollandiæ*), is becoming scarce. Of great birds resembling giant ostriches none now remain, but the bones found in Australia are like magnified relics of emeus. The ostrich, it will be remembered, has only two toes, and has wings, small and useless for flight, but plainly existent. The emeu has three toes, like the moa of New Zealand and the apteryx, but its

wings are quite rudimentary. So are those of a very rare bird, the Australian cassowary (*casuarius australis*), which, strange to say, breeds occasionally in the London Zoological Gardens. Australia is the only country with two kinds of "struthious" birds.

The piping crow (*Barita tibicen*) is a favourite with the colonists, and every visitor to Australia makes his acquaintance before long. Naturalists have been divided as to whether he is a shrike or a real crow. He certainly resembles a crow with a white cowl on his back. He has many of the qualities of the mocking bird, but does not appear to be gifted with a retentive memory. He is, however, very tame, good tempered, and playful, and learns not only to whistle tunes and imitate other birds, but also to sing and talk.

The black swan (*Cygnus atratus*) is almost as much the typical animal of Australia as the kangaroo. The colony of Western Australia has adopted it in particular, both because of its having been abundant in the territory and because the principal river is called after it. Perth, the capital, stands on Swan River, in which there is ever-flowing water, unlike the majority of the so-called streams of Australia. The swan figures on the postage, and also on the flag of the colony, as shown on a previous page. The black swan does not differ in any serious particular, except colour, from the more familiar white swan, but has a bright red beak, which contrasts pleasingly with the plumage.

The lyre bird (*Menura superba*) was formerly more common in Australia than it is now. Its plumage is very quiet in colour, and, though the male bird is about the size of an English pheasant, it is by no means so conspicuous. It is called "superba" on account of the tail which, though only of an ashy brown colour, spreads out into the traditional shape of a lyre. The lyre bird is found in the less settled parts of New South Wales, but unfortunately retreats before the progress of civilization, and, unless it is carefully preserved, it must shortly become extinct, which is the more pity, as the song is extremely sweet. It has also powers of mimicry, something like those of the piping crow. It is curious to observe that it belongs to the same order as our song birds, the thrush, for example, and the robin.

The brush turkey (*Talegalla lathami*) is very like, at first sight, to some of the denizens of an English farmyard. His habits are widely different. The whole family of *Megapodidæ*, to which the talegalla belongs, instead of hatching their eggs by incubation in a nest, construct a mound of earth, leaves, grass, sand, or other materials capable of generating and retaining heat. The eggs are then buried in the centre and carefully watched by both the parent birds until the young are strong enough to make their way out. They do not leave till they are almost

strong enough and sufficiently fledged to fly, which they begin to do in a couple of days.

The parrots of Australia are so curious, so various, and so beautiful, that no notice such as can be offered here is at all adequate. Even to draw up something like a list of the different kinds, with a brief account of a few typical examples, would fill a good sized volume. The last and best, and I may add, driest book on parrots, is published by the trustees of the British Museum, and was compiled for them by Count Salvadori. It is thoroughly scientific, the birds being classed chiefly by their anatomical structure. Count Salvadori begins with the flesh-eating nestors of New Zealand, which have hitherto been classed with cockatoos. As, however, there are no nestors in Australia, and no cockatoos in New Zealand, and as, moreover, the two birds are very easily distinguished, the present arrangement seems a better one. The lories come next and are very numerous, sixty-nine at least, of which eight are Australian. The blue mountain lory (*Trichoglossus swainsoni*) is the best known, both in England and in Australia. It breeds freely in captivity, and forms in many respects a most delightful pet. Of the next family, Cyclopsittacidæ, only three species are natives of Australia. Next we have the cockatoos. The first, the Goliath (*Microglossus aterrimus*) is well known for his black plumage and great size. It is not so common in Australia as in New Guinea. Few people keep it as a pet, but it is said to be very intelligent and bright in spite of its funereal aspect. There is a smaller kind, and besides, there is a dark brown bird (*Calyptorhynchus funereus*) in which the prevailing tint is relieved by a few yellow feathers on the head. Australia produces several more of these sombre coloured cockatoos, and one in which, though the body is of a slate grey, the head and crest are scarlet (*Callocephalon galeatum*). Next we come to the white, the rosy, the sulphur-crested, and other cockatoos more or less familiar. Of these, the most beautiful is known as Leadbeater's. It is all over of a delicious rosy white, and its crest is thus described: "feathers of the occipital crest vermilion at the base, with a yellow spot or band in the centre, and white at the tip." It is one of the tamest and most affectionate of cockatoos, and I knew one which could not only talk well, but would also answer questions, a rare accomplishment. Some people are fond of the long-nose (*Licmetis nasica*), and the plain white goffin (*Cacatua goffini*) bears an excellent character. There is a little bird—it used to be called the red-cheeked nymphicus—which is very like a dwarf cockatoo. It is easily domesticated, but is rather uninteresting. It is the *cockateel* of Dr. Greene, who characterises it as active and lively, and adds that few birds are more attractive. The Australian

parrakeets are very numerous, and large flocks of almost all may be seen by any one who takes the trouble to look for them. Those known by the general name of *platycercus* are all beautiful, the prettiest being that described as *elegans*, in which the plumage is blue and crimson. Bauer's parrakeet (*Bernardius semitorquatus*) is distinguished by its yellow collar; but it would be impossible even to name a tithe of these lovely birds. It is very interesting, if possible, to watch some of them in their native haunts, as each bird wears the plumage appropriate to the colours which surround him. For this reason the new comer will sometimes seek in vain for the parrakeet which at the moment is actually before his eyes.

CHAPTER XIV.

AUSTRALIA.

INTRODUCTORY.—FIRST DISCOVERY.—FIRST SETTLEMENT.—PROSPERITY.—GOLD.—EDUCATION.—WESTERN AUSTRALIA.—SOUTH AUSTRALIA.—VICTORIA.—NEW SOUTH WALES.—QUEENSLAND.—TASMANIA.—NEW ZEALAND.—FIJI.

IN this chapter Mr. Matthew Macfie gives us the result of a recent tour round the Australasian Colonies:—

When the tourist catches the first glimpse of Australia at Cape Leeuwin, the great island continent can hardly fail to present to him an aspect of weird fascination, especially if he has been at the pains, beforehand, to acquire some general information about its natural features. It is not the storm-beaten rocky coasts, or the sand plains stretching far behind them, or any visible difference between the appearance of other shores, and the somewhat arid and monotonous view which strikes the eye as the steamer brings him nearer his destination, that accounts for the novel interest which inspires him. The secret of his spell-bound experience is mainly due to the fact that he is face to face with a great British possession whose physical characteristics and paleontological records are without parallel in the whole world. North America can boast the outcrop of Laurentian rocks—the most ancient strata known to geology—and of holding in the deposit of a primæval sea-bottom, the imprint of the *Eozoon*, the connecting link between animal and vegetable life. But Australia enjoys the unique distinction of having been longer above water than any other known portion of the globe. In its *flora* and *fauna*, resembling no species of plants or animals to be found in the same or in any other latitude, Nature holds up to us a gigantic object-lesson carrying the mind back to forms and conditions of life which existed in many other regions scores of millions of years prior to the "World before the Flood," of which Montgomery sings anterior, probably, to the "Great Ice Age" which, according to Geikie and Ball, covered the entire northern hemisphere (for tens of thousands of years) with glaciers, and blotted out animal and plant life from

that section of the planet. Australia in being, for an infinitely long period, spared submergence, which has, in the interval, overtaken other land areas, has preserved, almost intact, forms of existence which once prevailed, with slight variations, over the length and breadth of the earth, but which have long since wholly disappeared elsewhere, with the trifling exception of the American opossums (*didelphys*), of which there are about twenty species. Innumerable ages before the original deeds were done out of which the mythologies of India, Persia, Egypt, Greece, and Scandinavia were evolved, the boundless eucalyptus forests waved, the kangaroo, the wallaby, the wombat, the bandicoot, the phalanger, the ant-eater, the platypus, the dingo, the flying-fox, the emu, and the parrot flourished; the hills and dales, far and near, ringing all the while with the merry notes of the laughing jackass, throughout Australia. The opinion is entertained by eminent ethnologists that the Australian aboriginals inhabiting the south of the Australian continent, are of African descent, and migrated from the recognised cradle of the negro race to Australia in a dimly remote past, when the latter country was joined to Africa by land. Assuming that theory to be well-founded, what change may have passed over the facial attributes of the "blackfellow" since he left the home of his original forefathers, is, doubtless, due to the influence of climate and intermarriage with hybrids. The natives in the Northern Territory are supposed, on the other hand, to be descended from the primæval tribes of India and the large islands in the Indian Archipelago, the most striking evidence of kinship between these populations being their common use of the boomerang. Compared with the antiquity of Australia, its indigenous inhabitants and its vegetation, other countries of the world—old as may be their geological formations and remote their prehistoric evolution—are but of yesterday. Anomalous though it may appear, in passing from England to America, we exchange an "old country" for one very much older, but when we reach Australia we tread the soil of a continent incalculably the senior of both.

The earliest discovery of Australia by Europeans is believed to be as recent as the first half of the sixteenth century. But allusions to a "Great South Land" are to be met with in writings dating as far back as the time of Alexander the Great, in the fourth century B.C. More than two hundred years later (B.C. 50 to A.D. 150), Strabo, Pliny, and Ptolemy make distinct mention of the same mysterious territory, although their accounts of its inhabitants are obviously apocryphal. There seems no doubt, however, that the existence of Australia was known to the Greeks and Romans. On the other hand, all trace of the channels through which their information was obtained has been hopelessly lost, and the geographical position and extent of the country remained uncertain to civilised peoples long after their

times. Competent authorities on the subject are convinced that in the eight centuries during which the Malay Peninsula and the Indian Archipelago were subject to Mahometan rule, the northern coasts of Australia were often visited by navigators and traders from those neighbouring regions. Indeed, the results of occasional contact between contiguous races are apparent in the facial and lingual peculiarities of the aborigines. There is abundant proof that the trepang fishery was carried on by the Chinese on the northern shores of Australia from a very distant period, and the features of the aborigines, resident about the Gulf of Carpentaria and Cape York, are said to reveal, in like manner, distinct evidence of visits from the "Celestial." Marco Polo, at the close of the thirteenth century, alludes to the Great South Land, although his book contains no sign that he had any personal knowledge of it. Until within the last few years, the man who was generally credited with having been the first European to discover Australia, was Fernandez de Quiros, a Spaniard, who sailed from Lima, at the beginning of the seventeenth century, with three ships, in the hope of finding the continent which had so long been an unsolved problem to navigators. He sighted land which —"the wish being father to the thought"—he believed to be the territory he was in search of. The opinion gains ground, however, that he was misled by his imagination, and that it was one of the New Hebrides islands which met his gaze. The real Columbus of Australia, it is contended, with some confidence, by a great living geographer and comparative philologist, was a Provençal navigator, Guillaume le Testu, a native of Grasse. The evidence upon which his claim to the honour is based, consists of French maps and related documents in the British Museum and the War Office of Paris. From this, it would appear that the discovery was made by the Frenchman in 1531, preceding that ascribed to the Spaniard by seventy-five years. The name of Torres was given to the Straits separating New Guinea from Australia by an unhappy accident. The crew of one of the ships of De Quiros having mutinied and refused to proceed further in the expedition, Torres took command of the other two vessels, and continued their course in a north-westerly direction, and, without having the least idea of merit in his achievement, he handed down his name to posterity.

The interesting story of persistent attempts made by the Dutch and the Englishman, Dampier, to explore the coasts of Australia, cannot be pursued within the limits of the present sketch, but the period covered by Dutch exploration, and until the arrival of Captain Cook on the shores of what is now the Colony of Victoria, in 1770, was upwards of a century and a half. The pioneer settlers were landed in New South Wales under Captain Arthur Phillip, and suffered great

hardships, eighteen years later, under which not a few of them succumbed. But among the survivors were men who rose to be worthy citizens, and whose descendants have occupied positions of honour and of public, as well as private, usefulness in the Australian Colonies since that rude *nucleus* of a settlement was formed. During the past forty years the increase of population and the rate of development in Australia have been marvellous beyond all anticipation. Yet little more than a narrow fringe on the east and south-east seaboard has hitherto been inhabited. It is seldom realised, even by residents of Australia, that the superficial area of the continent is only 25,372 square miles smaller than that of the United States, if the outlying territory of Alaska be excluded. But if Tasmania be added to Australia a slight advantage in size is shown in favour of the latter on this basis of calculation. If the States, with a population of 65,000,000, has ample room for five times that number without any risk of overcrowding, the scope for prudent settlement and enterprise in Australia must be practically boundless; its present inhabitants being not more than four-fifths of that of the Imperial metropolis. At the same time it should be borne in mind that Australia labours under unfavourable conditions, which must handicap her as a competitor with the great Western Republic, for population from Europe. Australia has to contend with uncertain seasons, which we look to the resources of science, in the artificial production of moisture, to neutralise. She is reported to have a semi-sterile interior, but this reproach is expected to pass away as cultivation extends. With the exception of the Murray, great waterways, such as abound in America, are conspicuous by their absence on the continent in the South Pacific, and during the chief part of her history, Australia has suffered from communication with Europe being slow and tedious, while a trip to the United States occupies less time than formerly was consumed in sailing from London to the North of Scotland. But this obstacle to progress is largely overcome by the rapid voyages now performed in the superb floating palaces of the Orient Line plying between England and the Australian Colonies. Taking into account the drawbacks which have been mentioned, these energetic communities may well be proud of the rate of their advancement. If their growth in numbers, wealth and prosperity is to continue unretarded, however, they must be prepared to welcome honest and industrious immigrants from Europe to till their productive lands and work their mines, without feelings of jealousy or distrust towards the new comers. The economic principle on which the United States has attained the largest measure of their greatness is that every able-bodied, upright and hard-working man arriving in that country is deemed equivalent to an addition of £200 to their reproductive capital. So long as employers and the industrial classes in Australia adhere firmly to an axiom

so safe for a new country to adopt, and give it practical effect, their steady expansion in profitable enterprise is assured.

The prime impulse to all development in Australasia has been the production of gold mines, and from 1851, when gold was first discovered, to 1891, these have yielded an amount valued at about £326,000,000. More recently, the discovery of rich silver mines has become an important factor in augmenting Australian wealth, and the value of that metal unearthed since 1863 is not less than £4,500,000; being derived mainly from Broken Hills in New South Wales, near the South Australian border. The coal mines of Australasia yield 5,000,000 tons of coal a year, and the output is progressive. It cannot be said that the bulk of the manufactures introduced into the Colonies have been conducted as successfully as agriculture and the production of minerals and metals have been, for the public advantage. Doubtless, protectionist tariffs, established for nearly a quarter of a century in Victoria, and creeping stealthily into several other colonies, may enable a handful of employers of protected labour, here and there, to become rich. But the invariable effect of a prohibitory fiscal policy is to increase enormously the cost of living to the population beyond what ruling rates of wages can compensate; the result being that the purchasing power of the sovereign is materially diminished and an unsurmountable barrier is placed in the way of exchange of products with other countries. Nevertheless, mistakes committed in regard to excessive customs' duties will only be temporary. The common sense of the majority will ultimately prevail and free trade, from the adoption of which dates the triumphant march of commercial and industrial progress in the United Kingdom, will inaugurate a new era of prosperity in Australia.

One of the very strongest guarantees for a high standard of intelligence being maintained in every department of Australian industry is the ample provision made for elementary, secondary, and university education in the Colonies. In every one of them the State system as affecting children of school age is compulsory and undenominational, or secular. Western Australia alone forms a qualified exception, as her Government grants some assistance to private denominational schools. In Victoria, Queensland, and New Zealand, public instruction is free; but fees are charged in the other colonies, although they are partially or wholly remitted in cases where parents are unable to pay. In the different colonies the prescribed school age varies. In Victoria it is from 6 to 13 years; in New South Wales and Western Australia, from 6 to 14; in Queensland, from 6 to 12; in South Australia, Tasmania, and New Zealand, from 7 to 13 years. The course of instruction given in the State schools

is admittedly excellent; the proportion of children in attendance to those enrolled is considered satisfactory, and as a body the teachers are in all respects well qualified for their work. The cost of primary education in the Australasian colonies in 1889 was £1,876,141, including £114,189 paid in fees by scholars. In all these colonies, with the exception of Queensland and Western Australia, there are well equipped and efficiently conducted universities, and their charters confer upon graduates "rank, precedence, and consideration" in the United Kingdom, the colonies, and other British possessions throughout the world, as fully as if their degrees had been granted by any university of the parent country. Queensland, however, is now petitioning for university privileges. The University of Sydney requires attendance at the classes of the professors in addition to success at examinations, as a *sine quâ non* of receiving degrees, while Victoria allows candidates to graduate on passing examinations and paying fees, without making work in the University classes indispensable. The University of New Zealand, as distinguished from both these, is solely an examining body, preparation for matriculation and graduation being conducted at intermediate colleges or privately, in that colony, as in the case of the University of London. The institutions for promoting higher education are most liberally supported by Government endowment, and in the more populous colonies they have been favoured with numerous munificent private bequests.

It would be too much to expect that the material growth of communities to which nature has been so bountiful in soil, climate, and metallic riches, should continue uncheckered. The very profusion of wealth passing through the hands of colonists, taken, in part, from Australian fields and mines, and sent out, in part, from England for investment, can hardly fail to offer temptation sometimes to over-speculation, the collapse of which brings ruin upon thousands. It cannot be said that the colonies have altogether escaped this peril, but it is by such discipline that national wisdom and caution are gained, and the people are safeguarded against repetition of financial imprudence.

WESTERN AUSTRALIA.

After ten days' continuous exposure to the fickle moods of wind and ocean, *en route* from Colombo, the picturesque scenery of King George's Sound is exceedingly welcome. The entrance is defended by three islands, "of which, one," says a writer in a London paper, "bearing the suggestive name of Haul Off Rock, is an immense mass of stone, strangely like such a mediæval fortress as the Castel' del' Ovo, at Naples. The westernmost island is Breaksea, and bears a lighthouse. . . . On Breaksea the whole force of the ocean waves is expended, and

when the wind is southerly the effects are grand in the extreme. Two or three of the curious 'blow-holes' which are seen on the Atlantic coasts of Ireland may be observed here. Behind these granite heights rise beautiful green hills, clothed with soft brushwood to the water's edge, and opening into wide bays eastward, some of which, as Oyster Harbour, rival even the Sound in their convenience and safety, yet are without settlers or cultivation still. Fine park-like lands extend for thirty miles or more from the shore, interspersed with gleaming lakes and wide expanses of pasture land. The tall head of Mount Clarence, from which the inland view may be best seen, is on our right as we enter the harbour from the Sound, by a passage only a few hundred yards wide, yet deep enough for any ship now afloat. Point Possession is on the south, or left hand side, and Point King, where there is a pilot station, on the right. . . . The whole harbour is about three miles in width from east to west, and two from north to south, and with the well protected Sound outside, would easily contain the navy of a first-rate power. As a coaling station between England and all the British possessions eastward and southward, its importance cannot be exaggerated. The climate is the most temperate and equable in all Australia, and even Devonshire, in its greatest glory, never saw such wild flowers. They grow, for the most part, on evergreen shrubs, some of which resemble the rhododendrons of our own climate, some the myrtle, some the daphne, some the lauristinus, though all are more or less different, and all exhale, whether they are in bloom or not, the most delicate and aromatic perfume—a perfume doubly sweet to anyone who has been sailing for weeks or months upon the sea." Western Australia contains more than one-third of the whole territory of Australia, and although its settlement began sixty-two years ago—before Victoria or South Australia was born—its population, singularly enough, is in the inverse ratio to its size and age. According to the late census returns, it only numbers 50,000 inhabitants; but since the phenomenal gold finds in the Murchison and Coolgardie districts, the total population has risen to about 70,000, and is rapidly increasing. It is estimated that no fewer than 15,000 arrived from the Eastern Colonies in the first quarter of 1894, and this only represents the first ripple of a great and growing tide of immigration into this youngest of our self-governing colonies. The area of Western Australia covers over 1,000,000 square miles, and it is about eleven times the extent of England. Its greatest length from north to south is 1,280 miles, and its greatest breadth from west to east is 800 miles. It is rare that the irony of fate is so curiously illustrated in the history of a new country as in the case of this colony. Its coasts had engaged the attention of explorers 240 years before Captain Cook came on the scene, and yet its interior continues to be regarded as an inhospitable *terra incognita*. For thousands

of visitors who proceed *en route* from England to the eastern colonies, very few indeed can claim any acquaintance with this largest colony of the Australian group beyond touching at Albany, the port of call for ocean going steamers. In 1830, a thousand intending settlers landed in thirty vessels, from New South Wales, on the banks of Swan River, with an aggregate capital of £140,000, under promise from the Governor of New South Wales of liberal land grants. But, unfortunately, the immigrants, for the most part, turned out to be totally unfit to bear the privations incident to life under such uninviting conditions, and many of them left the country in disgust. Its development was again hindered in 1851, and subsequently, by the departure of large numbers to the then newly discovered gold mines of Victoria; the consequence being that it was threatened with depopulation. Another disadvantage to which the colony has been subjected is the great distance of the most inhabited portion of it from other colonial centres. But the clearest proof that this disadvantage is virtually inoperative at present is, that the colonists are still very far from having overtaken the supply of their own internal wants, irrespective of the export of produce. Although there is abundance of superior land available for growing vegetables, dairy produce, cereals, and fruit within easy distance of the towns, it is difficult to name a single food requisite that is not, to some extent, imported from South Australia. The impression which more than any other now stands in the way of immigrants from Eastern Australia, as well as from England, engaging in land culture in Western Australia, is that it is, at best, a *Sahara*, which has no adequate reward to offer in return for the investment of capital and the application of industry. But personal inspection of the country on the main lines of railway and in bush districts, only reached by waggon or on horseback, has convinced the present writer that this wholesale aspersion of Western Australia has no better foundation than prejudice. It is hardly to be expected that a region of such magnitude should be free from barren tracts. The climate cannot fail to vary in an area swept by so many latitudes. Occasional droughts occur as in other parts of Australia, to the detriment of flocks and herds. But there exist in the colony large expanses of land suitable for the cultivation of all kinds of temperate, semi-tropical, and tropical products, and capable of supporting many scores of millions in ample comfort. Few men were better acquainted with the colony than the late Sir Frederick Weld, one of its most respected ex-Governors, and his invariable reply to people at a distance who decried it as "a mere sand-heap" was, "If it be only sand (which is not the case) it is sand that will grow anything if you give it water." The new lease of vigorous life lately taken by the country is apparent in the marked increase in the public

revenue since the gold mines began to attract notice a few years ago. In 1891 the total amounted to nearly half a million sterling, which shows an advance of £80,000 upon the year preceding, and for 1892 the revenue exceeded that of 1891 by £46,000. On the other hand it is satisfactory to notice that in the annual balance sheet the expenditure is considerably less than the income. The Government borrowings from England now reach upwards of two millions. The loan authorised by the local Parliament last year was designed for the construction of railways from Busselton to Perth and from Northam to Yilgarn. The import values have more than doubled between 1881 and 1892, standing in the latter year at £1,391,109. But the exports for 1892 are £600,000 under that figure. In a colony more than half a century old, so exceptionally favourable for rearing pigs, it is almost incredible that hams should be still largely imported, and that in the face of the extensive areas adapted for cattle grazing in the section of country around Perth, and the whole way south to the coast, butter and cheese should still be imported in very large quantities from other Colonies. Even cereals have hitherto been purchased from the same sources, especially oats, to an extent that excites surprise, in view of the immense tracts of arable land having a sufficient rainfall along the greater part of the Beverley and Perth and Great Southern lines, in the region traversed by the Midland Railway, and in the Blackwood, Bunbury, and other districts. The chief item among the exports is wool, which is followed in the order of value by gold, pearl-shell, timber, pearls, skins, guano, tin, and horses. No sheep to be met with on the squatting stations can be compared for quality with the high class Merinos in the Eastern Colonies, but the sheep owners seem perfectly satisfied with their incomes, and have no difficulty in finding a market in Melbourne as well as in France, Germany, Austria, and England for their annual clip. In former years a brisk trade was done between the Colony and China in sandalwood, for the manufacture of incense tapers burnt on Buddhist altars. But the supply rapidly approaches exhaustion, a circumstance not to be regretted, as many small farmers, obtaining enough to live upon from cutting down this wood and carting it to market, will have to turn their attention more closely to farm work. The demand for jarrah, a species of eucalyptus peculiar to Western Australia, advances at a rapid pace. The value of this timber for submarine structures is now almost universally acknowledged by civil engineers, its special virtue being that it resists the attacks of the *teredo navalis* under water, and those of the white ant overhead. It is also much inquired for by borough authorities in England for street paving. Karri is also in growing request for various purposes, particularly bridges, and, like jarrah, is exported to the other Australian Colonies, Natal, and the parent country. But

the most recent export and the one which increases most rapidly and is destined to "make the wilderness and the solitary place become glad," is gold, which is already extracted in amounts that may well astonish the uninitiated. Events in the immediate future will certainly justify the epithet often applied to Western Australia, as "the Cinderella of the group." The Kimberley gold field, comprising 47,000 square miles in extent, was only reported on in 1884 as a locality in which gold was likely to be found, and the Mining Warden has officially stated, that up to July, 1891, the total amount of quartz crushed by a comparatively small number of men, with restricted appliances, was 4,337 tons 6 cwts., yielding 4,268 ozs. 7 dwts. 5 grains of gold. In one case a mine yielded 351 ozs. 14 dwts. from 40 tons of stone. The Yilgarn gold field, the area of which is 13,000 square miles, up to the date just specified, gave 10,401 ozs. 5 dwts. 12 grains, to 9,448 tons quartz. Nuggets from 333 ozs. downwards have been obtained from the Pilbarra field and elsewhere, and authentic reports were received from Murchison River at the close of 1891, of a few men working on alluvial deposits, getting from £10 to £15 per day. Experts have expressed their firm conviction that several parallel auriferous reefs can be traced in unbroken continuity from the southern to the northern coasts of the Colony. The Pilbarra gold field, having a proclaimed area of 32,000 square miles, is situated in a north-westerly direction, between the coast on the North, the Fortescue River on the South, and the De Grey River and Warburton's great sandy tableland on the East. Some of the claims in that region are paying 2 ozs. to the ton. The marvels of wealth explored in Austin Lake, Cue, Coolgardie, Hannan's Rush, and Kuralpi almost surpass the most brilliant output of Ballarat and Bendigo. From £1,207 reported to have been taken from West Australian gold mines in 1886, the returns increased to £421,000 in 1893, and will greatly expand for many years to come. With these and other facts of a similar nature before us, it can no longer be doubted that Western Australia, which a few years ago was considered as devoid of gold-bearing rocks, has developed wide-spread and lasting gold fields, which bid fair, at an early date, to eclipse those of repute in colonies much more populous.

If we avail ourselves of the admirable travelling facilities afforded by the railway connecting Beverley with Albany, and bridging over a distance of 243 miles, an interesting view of the country may be obtained on the road, although the largest patches of superior land are not usually visible from the line. Before starting from Albany a glance at the embryo city ought not to be omitted. Crowning the surrounding heights, and overlooking the spacious bay, on which the town is situated, are many substantial villas occupied by wealthy squatters and prosperous tradesmen. Several banking erections, evidently built in anticipation of largely increased population in

future years, are to be met with. The town hall and borough council chambers, built of stone, are more than equal to the requirements of a population of 2,600. It cannot be said that corresponding ambition has been shown in the architecture of the local hotels. The accommodation at Wand's, however, is comfortable, and the *cuisine* superior. Adjoining it is the club, which is frequented by most of the leading citizens. In the vicinity of Mount Barker, forty miles up the Great Southern line, is a wide stretch of remarkably productive soil, favoured with an abundant rainfall. The character of the land is fully attested by the Brobdingnagian potatoes, cabbages, and other vegetables which greet the traveller in the season, and it would be difficult to find a district in which apples, pears, plums, and peaches, come to greater perfection. A few miles from Kendinup (the number of native names ending with *up* is extraordinary), a station ten miles further north, may be seen on a sheep run one of the first quartz reefs worked in the Colony. The machinery and the shaft are in a state of dilapidation owing to the financial inability of the owners, although the government geologist has reported that it holds out every prospect of brilliant results to those who have capital, skill, and patience to deal with it. Half-way to Beverley are two five-year old settlements, Broome and Katanning, which are pushing ahead in friendly rivalry and steadily gathering round them all the equipments of town centres for agricultural settlements. Near Wagin Lake are the elements, in soil and climate, of a community not less prosperous, and at some distance from the line, in the same neighbourhood, the Arthur's and the Williams' settlements will repay a visit. At these places apricots and grapes attain great proportions and a delicious flavour, while the farmers themselves, as a rule, present a picture of happy contentment. At Beverley, the Northern terminus of the Great Southern Railway, the day's journey closes at eight p.m., having occupied, with one or two brief intervals on the road for refreshment, twelve hours. At the wooden shanties provided in this scattered hamlet for the travellers' accommodation, the plainest fare, the most primitive attendance, and sometimes the roughest fellow guests have to be borne with. But if our destination be Perth, the capital, the train on the government line starts at eight a.m., and for another 100 miles we are whisked through country more undulating, more densely wooded, and, on the whole, more uniformly fertile than in the first division of our journey. In two hours we pass York, a straggling collection of houses, with a population of 1,200, in sight of Mount Stirling, and surrounded for many miles by cultivated fields, the property of well-to-do farmers, whose numbers might be indefinitely multiplied to the convenience of the general public. From this point the distance to Yilgarn, lying to the north-east, is about 180 miles, and miners bound for the gold-fields in that region can either travel

on foot, on horseback, by waggon, or by stage.* Past noon, Guildford, another quiet sequestered rural centre is reached. Here the scenery is decidedly interesting, and marks of intense culture are more noticeable in the neighbourhood than at any of the other places on the line from Beverley to Perth. Large areas are devoted to vineyards and orchards, and it would be difficult to find a district in the country to compare with that comprised between Guildford and Fremantle, for the production of wine and raisins. Within that area figs are grown, not inferior to the Smyrna quality; wine surpassing many Seville brands are obtainable, and raisins that quite equal second best Malagas. Perth is reached at two p.m., and our first surprise is that in the midst of so many spacious buildings, including banks, private residences, town hall, Protestant and Roman Catholic cathedrals, public library, state grammar school, handsome government and post offices and Governor's official residence, with its artistically laid-out gardens, in every way worthy of a potentially great colony, there is not a hotel in the place that approaches reasonable comfort. But it is probable that this want will not be allowed to remain much longer unsupplied. The population of the Perth Magisterial district, which includes the suburbs and several small outlying hamlets, as disclosed by the census of April, 1891, did not exceed 9,617. Males numbered 4,978, and females about 360 under that figure. Although the drainage of the city is capable of improvement, and the heat rises in January to a maximum of 106° in the shade, the health of the community is perfectly satisfactory, the death-rate throughout the Colony ranging usually between eleven and thirteen per 1,000 living. The Darling Range, which extends 300 miles from Yatheroo in the North, to Point D'Entrecasteau in the South, crosses the latitude of Perth within easy distance of the city. The water supply of the inhabitants is conveyed from an artificial reservoir in the hills, about thirty miles off. The largest jarrah timber works are at Jarrahdale, about forty miles from Perth. The proprietors of these have sawmills in different parts of their estate, through which a railway extends to the port of Rockingham (a distance of thirty miles from the sawmills) at which vessels receive cargoes of jarrah for abroad. The West Australian Timber Company hold a large jarrah concession in the southern part of Geographe Bay, with necessary mechanical appliances, and a railway running eighteen miles through the forest, but its operations are, for financial reasons, suspended for the present. Other jarrah forests, of smaller dimensions, are being worked in the Darling Range and on the south-west coast,

* In 1895 the railway from Northam, on the Perth and Beverley Line, to Yilgarn will be completed, and is certain to be extended to Coolgardie, being ultimately, in all probability, carried to the South Australian border.

and several important sawmill companies in the karri forest are in a prosperous condition. The whole section of country to the west of the railway lines from Albany to Fremantle, is regarded as the garden of Western Australia, from the richness of its soil, the wealth of its forests, and the promise of its tin and coal mines. Within that area, orchard fruits, cereals, vegetables, and timber thrive, and minerals abound. The economic importance of the locality has so impressed the government that they have constructed a railway, connecting Busselton with Perth, and it is expected that a line will be formed through the Blackwood district to connect with the Great Southern line beyond Kojunup. At the same time a land grant railway, 240 miles in length, is in course of construction from Guildford, fifteen miles from Perth, to Walkaway, near the port of Geraldton, and will be opened for traffic early in 1895. This line is destined to be the shortest route to the great Murchison gold mines, *viâ* Mullewa. From the latter point a line is contemplated to CUE, the centre of the Murchison district. So productive is the soil along the Midland route, especially on the east side of the line, for cereals and semi-tropical productions, that it can hardly fail to become the chief source of food supplies for the gold mining population on the Murchison.

Almost equi-distant with Guildford from Perth, but in a westerly direction, is Fremantle, which has done service as a seaport ever since the Swan River settlement was founded, sixty-four years ago. Its present population amounts to 5,607, chiefly males. The houses, which are principally built of solid stone, are distributed throughout well planned streets, which are usually very much alive with business activity, from morning till night. The harbour is not well suited by nature to afford shelter to vessels, but the construction of a breakwater is in contemplation. A line of steamers plying between Western Australia and Singapore call there, and often may be seen to ride when anchored at the wharves, even in calm weather, in the absence of all protection from the ocean swell. Some enterprising vignerons in the vicinity are turning their attention in earnest to wine making, and in no part of the country are vine growing prospects more encouraging. It is when we follow in the track of the New Midland Railway from Guildford, northward towards Geraldton and Walkaway, however, that we enter a district pre-eminently congenial to orange and olive culture, although these fruits, in common with mandarins and nectarines, are developed in choice varieties farther south. Settlements naturally become more sparse as we ascend northward. In the two contiguous centres just named there is a collective population of 2,200, but in the coast towns of Carnarvon, Roebourne, and Derby, there would be barely 1,000 in all. The coast line all the way up is indented with numerous harbours, adjacent to which are islands occurring at intervals, some

of which are used for grazing sheep and cattle, others being haunts of a species of edible turtle which abound in that region. For hundreds of miles inland on the Fitzroy, the De Grey, the Harding, the Fortescue, the Ashburton, the Gascoyne, the Murchison, and other rivers, sheep-runs prevail, and although droughts are sometimes encountered, the sheep are preserved, sleek and fat, throughout wide regions, by feeding on saltbush, which grows in profusion. From all that can be learned of the very partially developed resources of Western Australia, we may conclude that the day can not be far distant when it will emerge from its prolonged obscurity. In 1890 the Colony received responsible government from the Crown, and in that year it started on its career with two houses of parliament and a cabinet, of whom the distinguished explorer the Hon. (now Sir) John Forrest, was appointed by the Governor, Sir W. Robinson, the first Premier.

SOUTH AUSTRALIA.

After a passage of a thousand miles, from Albany to the gulf of St. Vincent, which occupies about four days, we leave behind the dull and monotonous experiences of the "Great Australian Bight," and enter smoother water behind Kangaroo Island on our way through Investigator Strait to the temporary anchorage in Largs Bay. Here the first thing that strikes the notice of passengers is that they are some miles from shore and that they are obliged to submit to the inconvenience of landing in a small primitive steamer, although South Australia cannot plead the excuse of having either a poor or an insignificant population. When we learn that the colony contains 331,721 inhabitants, many of whom are rich and enterprising, and that it is visited on an average by three or four large steamers a week, surprise, at the absence of a wharf extended far enough into the bay to admit of loading and discharging cargo without the tedious process now in operation, is increased. The beach, as first seen from the vessel, has a pleasing aspect, being dotted with snug-looking detached villas, stretching in the direction of Glenelg. A quarter of a mile from the landing stage the railway train starts for Adelaide, a distance of thirteen miles. We pass through an unbroken line of houses and people almost to the end of the journey. We catch a glimpse, *en route*, of Port Adelaide with its shipping on one side and "the Semaphore" on the other, the latter being also an important depôt for wheat stores, wholesale warehouses and shipping.

Before taking an interior view of the capital, which Captain Hindmarsh, the first Governor wished, against the better judgment of the pioneer colonists, to locate some miles nearer the shore, it may be not inappropriate to consider for a moment,

how South Australia came to be what it is. Like the colony we have passed under review, its formidable extent, in some respects, proves a barrier to its rapid development. It comprises no less than 903,690 square miles, including the northern territory, which is administered from Adelaide, and constitutes rather less than one-third the Australian Continent. When it is remembered that Victoria runs farther south than South Australia, it must be clear that the designation of the latter is a misnomer. The south coast had been visited by navigators before Lieutenant Matthew Flinders, but his title to the honour of being the practical founder of the colony remains undisputed. He surveyed the seaboard in 1802, sighted Fowlers' Bay and sailed thence eastward, naming the various points and bays he fell in with as far as Encounter Bay. It was from his report that a body of gentlemen in England were induced to form themselves, in 1832, into the South Australian Land Company, with a capital of £50,000, for the purpose of colonising the new territory. Other companies followed, with varying success, and in 1836 a beginning was made in earnest with the work of colonisation. In the following year the first newspaper was issued, the first bank opened, and the first sale of town allotments took place at Adelaide. In the following year the first vessel cleared for Great Britain, her cargo consisting entirely of oil and whalebone, and in the same year the first place of worship was completed. After a brief period of hardship, largely due to misgovernment, the colonists enjoyed uninterrupted prosperity up to 1850, the population having risen to 63,900 in the thirteen years which had elapsed since the founding of the colony; and 64,728 acres of land were under cultivation. Assuming that the trade of the colony may be taken as an index of its progress, it should be noted that the total imports are about £7,500,000, and the exports, which have recently been on the increase, are about a million above that figure. The state railways for some years, recently, earned full interest on loan capital expended upon them and left a substantial surplus, but this source of public income has suffered from the general financial depression which prevails in Australia. The public revenue exceeds two and a half millions, and the expenditure is ordinarily kept below that level. The indebtedness of the colony to England for government loans, subscribed by the investing public, is about £20,000,000. A notable addition to the wealth of South Australia was caused by the discovery of the celebrated Burra-Burra Mine in 1845. This marvellous deposit of copper, for some years the richest in the world, yielded, in the first three years of working, 10,000 tons, valued at £700,000. But the fame of the Burra-Burra has long been eclipsed by the Moonta and Wallaroo Mines at Yorke Peninsula. An exodus of 15,000 men to the Victorian diggings produced grave and manifold embarrassments in the colony, but to all market

gardeners and agriculturists who stayed on the land, the sudden "rush" of adventurers to the neighbouring colony became, for some years, a surer source of gain than the more speculative industry of gold mining. The quartz crushings from the Teetulpa Reefs in the northern territory and others situated at King's Bluff and Mingary unmistakeably prove the existence of permanent and payable gold mines. Other auriferous sections of rock of considerable extent, have been opened at the Stapleton, the Howley, the Britannia, Bridge Creek, and Maude Creek,



SUPREME COURT, ADELAIDE.

covering a distance of 145 miles. Encouraging indications of silver, tin, and other minerals are traceable, especially in the north, and the declared value of minerals and metallic products exported from the colony up to 1890 borders on £20,000,000. The discovery of rich silver ore in the Barrier Ranges, although within the New South Wales boundary, has brought a great increase of railway and general business traffic to South Australia, while some of the largest shareholders in the celebrated Broken Hill Proprietary Mine in the same locality reside in South

Australia. The late Mr. Tenison Wood, F.G.S., the Government Geologist, in an elaborate report on the geology of the northern territory, says: "Very little is yet known of the mineral resources of the northern territory. It is exceptionally rich in minerals, only a small portion of which has yet been made known to the public." He also expresses the belief that the same quantity of mineral, veins of gold, silver, tin, copper, and lead, will not be found in an equal area in Australia, and, at the same time, doubts if many provinces will be found in any country so favoured as Arnhem's Land, abutting on the Gulf of Carpentaria, in respect to mineral riches. As regards agriculture nearly 2,000,000 acres are laid down in wheat, the general average of which works out at nine-and-three-quarter bushels to the acre, giving a total of about 20,000,000 bushels. It is, however, to be regretted that owing to want of care in carrying out a rotation of crops the soil is liable to become exhausted, and facilities for manuring on an adequate scale not being readily available, large blocks of land contiguous to the coast are constantly going out of cultivation. The consequence is that virgin land has to be sought in the interior, which involves heavy cost of transit. One of the prominent manufactures of the colony is the outcome of an invention by a local machinist, who has placed farmers under deep obligation by the introduction of a "stripper" that alone renders it possible to grow wheat at a profit in the country, as it enables one man to reap and thresh ten acres of wheat in a day. On a well-known and enormous farm on Gawler Plains harvesting operations with this machine may be seen on a gigantic scale. As in other Australian colonies, the staple export is wool. In little more than half-a-century sheep have multiplied from a few ewes, and fewer rams, to upwards of 7,000,000, the value of the wool exports exceeding £2,000,000 per annum. Silk appears destined to take rank in time as a leading article of export. An expert, after having this South Australian product thrown and manufactured into a quantity of handkerchiefs in England, reported as follows:—"The silk reeled at Leek from Australian cocoons, as a winding silk, is superior to China silk, and about equal to a good Japan or Italian. . . Australia need not trouble herself with cocoon reeling at all, but should export the cocoons as raw produce to the reeling districts of Bengal. . . . Mr. Morey (who has the management of numerous filatures in the Rajshai district, where a considerable proportion of the population is employed in cocoon-reeling) informed me that their factories could take all the cocoons which the colonies could produce for some time." It is estimated that land devoted to the growth of mulberry trees in connection with the rearing of the silk-worm, would yield from £60 to £200 an acre, according to the nature of the soil.

The larger vineyards are among the sights of South Australia. At Dr. Penfold's, in Mackay, on the slope of a hill seven miles from Adelaide, there are wine vats in the cellars capable of containing thousands of gallons. Mr. Smith, of Yalumba Vineyard, produces 150,000 gallons of wine a year, and Mr. Hardie takes rank as the greatest wine grower in the Colony. The experimental shipments of apples, pears, and oranges from South Australia to London during and since the Jubilee Exhibition of 1886, show great future possibilities in the supply of fresh fruit

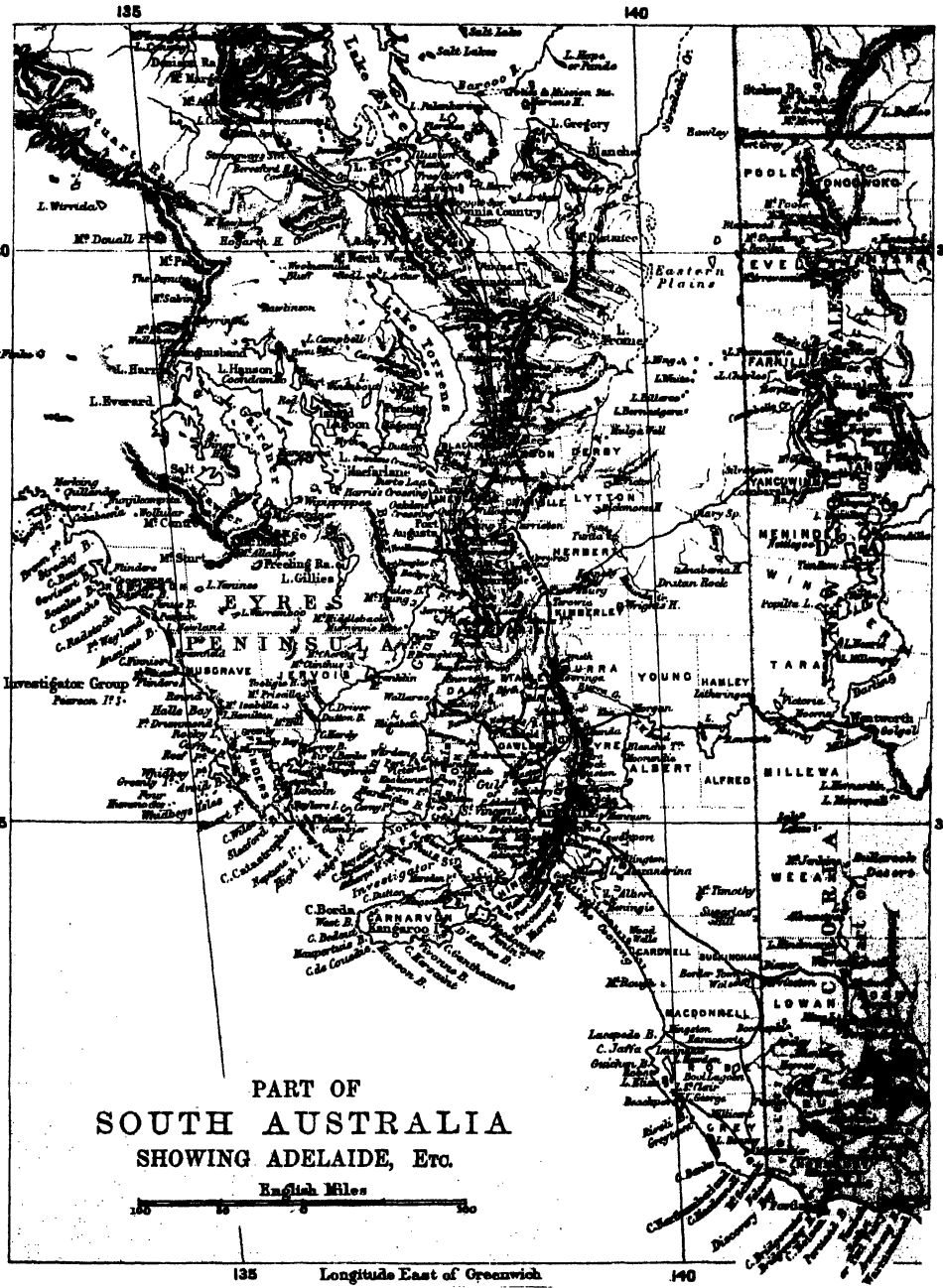


POST OFFICE, ADELAIDE.

to the Northern Hemisphere at a season of the year when it is unobtainable, except from the Antipodes. Dessert raisins, *Z*ante currants, almonds and sultanas, shown by South Australian exhibitors, compare favourably with the higher qualities usually imported into England from the Mediterranean and the Cape of Good Hope. Until the establishment of jam factories it was common to see peaches, apricots, and apples carried in loads to the pigsties; but preserving works have had the useful effect of raising prices for these commodities. Single bunches of grapes have been

met with, fourteen-and-a-half to seventeen-and-a-half lbs. in weight, but bunches of seven to eight lbs. are not uncommon among exhibits at horticultural shows, while three to four lb. bunches are regularly seen in local shop windows. As far back as forty-five years ago South Australia commenced olive plantations with varieties from France. The oil expressed from them received "Honourable Mention" at the Exhibition of 1851, and since that incentive was given to its production, it has gradually advanced. The culture and export of wattle bark (*acacia mimosa*) gives promise of importance, large quantities being imported into England for tanning purposes.

A hasty inspection of Adelaide will be much aided by the guidance of an extract from an article in the *Saturday Review*, under the heading "A Model City":—"You have approached Victoria Square by King William Street. In front, across the square, are the Post Office and the Town Hall, whose towers you have already noticed from the sea. The busier streets open at right angles, the pathways on the sides facing the sun being protected by awnings. Although English is spoken all around, although English names are over every shop door, and English wares in every window, you do not feel for a single moment that you are in any part of England. This is perhaps due to the glorious atmosphere, perhaps to something wholly impossible to define; a combination it may be, of the sunshine, the dark trees, the low houses, and an all-pervading look of cleanness and freshness in which Adelaide stands alone. The whole city consists, to describe it briefly, of a park extending over two hills, with the river dividing them, one square patch of 700 acres being covered with streets of shops and banks in the southern park, and another of 300 on the northern hill being appropriated to villas, churches, colleges, and little rows of vine-clad houses in wide gardens. . . . On the slope which falls towards the Torrens from the southern division of the city is Government House, the new houses of parliament, the public reading room, the library and museum, the public gallery, the university, and beyond them, towards the eastern valley, a botanic garden, of which every South Australian is proud, and not without reason. . . . The museum contains an extensive collection of local animals, birds, and minerals. . . . The university building consists chiefly of a very stiff but handsome and costly hall with lecture rooms, in the style of Italian Gothic, not unsuited to the climate. . . . The other public buildings of Adelaide, while scarcely so ambitious as those of Melbourne, betray the work of the same hands and heads. . . . The town hall and the post office are evidently by the same hands as the post office and law courts at Melbourne, and are very good samples of the Palladian style which had its birthplace under such a sky as this. The outskirts


135
140
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Lake Eyre
Lake Torrens
Eastern Plains
EYRE PENINSULA
Investigator Group
Pearson Is.
PART OF
SOUTH AUSTRALIA
SHOWING ADELAIDE, ETC.
English Miles
100 50 0 100
Longitude East of Greenwich

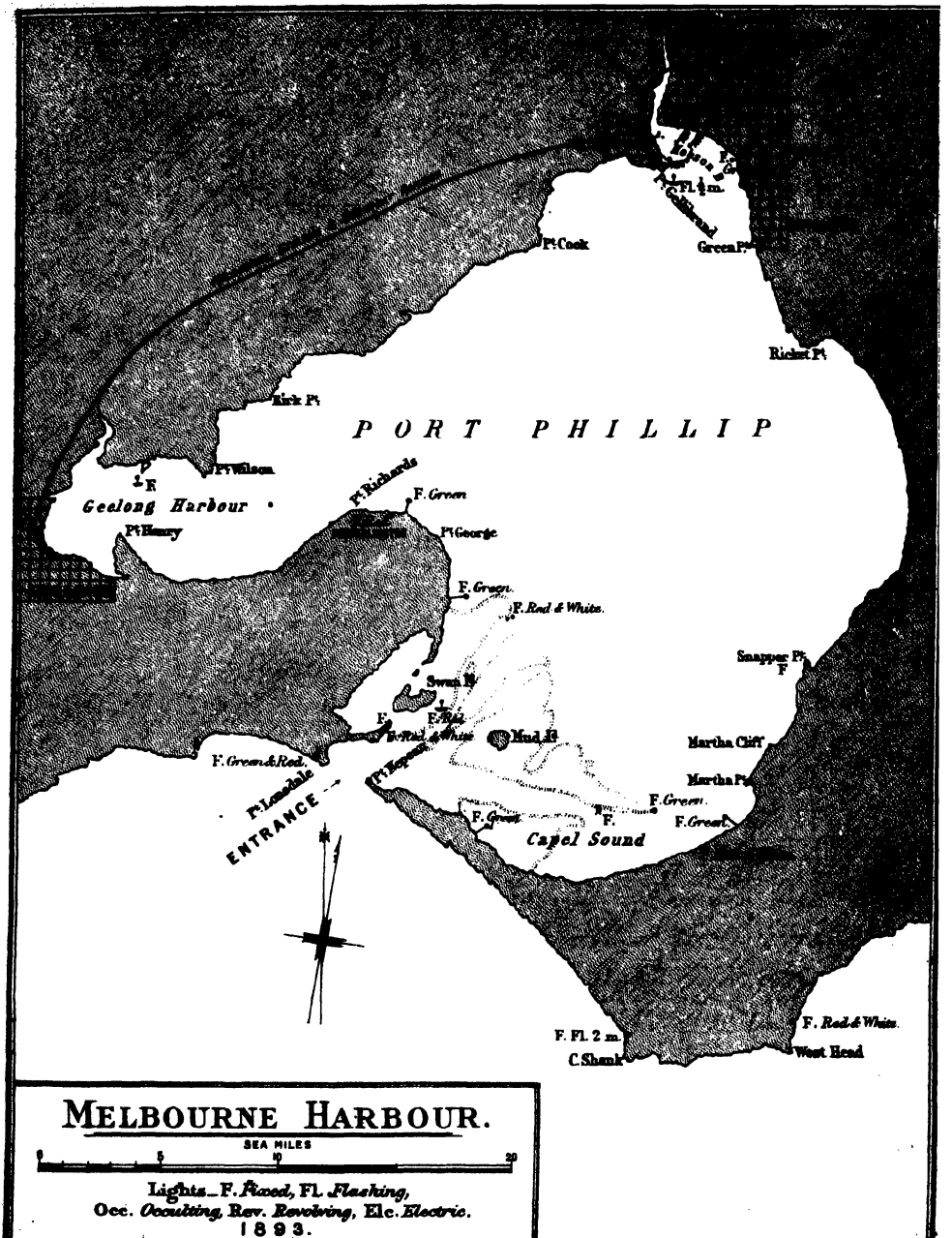
of Adelaide are even more beautiful than those of Melbourne. Mountains rising to some 2,400 feet are situated within a few miles, and are full of well-wooded and picturesque scenery—scenery which the South Australian colonist, who, presumably, has never seen anything else to compare with it, characterises as of unrivalled loveliness. . . . There are some beautiful gorges, lined with orange groves, on the slopes of Mount Lofty and Mount Barker. The prevailing impression is that of prosperity." The city and its environs, extending over an area of about 100 square miles, are supplied with pure water from two reservoirs, situated a short distance off where the Torrens river leaves the hills. A remarkable triumph of engineering skill has been achieved in a scheme of deep sewerage, which has been attended with a fall in the death rate of Adelaide beyond what could have been imagined. Formerly the main drain carried all the sewage into the Torrens, with results exceedingly fatal to the inhabitants. Under the new system, planned by the designer of the drainage system of Calcutta, the sewage is conveyed about four miles to the north, where a farm has been established for its utilisation.

Leaving the metropolis by rail we reach Gawler, 26 miles northward, which has a population of about 2,000. It is the centre of a large agricultural district, and is famous for its flour mills and machine factories. Twenty-four miles farther, in the same direction, is Kapunda. Its population is somewhat larger than that of Gawler, and from being originally a mining centre, it has been transformed into one dependent upon agriculture for its support. On a line branching off at Gawler is Burra, 100 miles from Adelaide. In the palmy days of the mine, which spread the fame of the locality to the ends of the earth, it was a hive of busy industry, but since the supply of copper ore failed it has almost assumed the appearance of a deserted village. Port Pirie, in Spencer's Gulf, has a railway system of its own joined to the northern trunk line. More wheat is shipped from this port than from any other in the colony, not excepting Port Adelaide. Fifty-five miles higher, at the very head of the gulf, is Port Augusta, with a large wool trade and, in good seasons, a considerable wheat export. Two prospective factors are relied upon for the growth of this hamlet of 800 souls. It is expected to become the future terminus of the proposed trans-continental railway from Port Darwin in the Northern Territory.

The prevailing fauna are nearly identical with what are indigenous to Western Australia. The flora, so far as trees are concerned, however, compare in variety of species and height with those both east and west of the colony. The number of species of *eucalypts* known at present in Australia is about 134; of these only 30 appear in South Australia, and of the *acacia* 300 species are described, of

which there are only 70 in the latter colony. The list of trees above 30 feet in height in Australia comprises 950 kinds. Of these only 88 are found in Western Australia, and 63 in South Australia. It is noteworthy that in South Australian vegetation there should be an absence of native edible fruits, and a marked deficiency in edible root-bearing plants. Gum and resin-bearing trees are abundant; *Xanthorrhœa quadrangulata* (F. Mueller) and *semiplana* (F. Mueller) exude a resin which contains nitro-picric acid, from which a valuable dye may be extracted. Abundant material for the manufacture of the best paper exists in the leaves and bark of many species of flora. Compared with Western Australia poisonous plants are few, but the *Lotus australis* is very generally distributed, and is injurious to sheep. In declivities of gullies with their fertile soil and cool climate the greatest part of culinary vegetables are grown for market, which are large, sound, and supplied uninterruptedly throughout the year. Gooseberries, strawberries, raspberries, and currants of proportionate quality thrive under the same conditions. The saltbush, a most valuable plant for a pastoral community, abounds as in the western sister colony. In times when all other forms of vegetation are suffering from drought, this plant alone withstands the intense heat of the sun, and maintains its freshness, saving thousands of sheep from starvation. The grass lands present very much the configuration of the savannahs of British Guiana in their undulations. The annual grasses spring up in a few days after the rainy season sets in in the month of May, and as by magic a carpet of green displaces the sunburnt waste. With the luxuriant verdure are recalled to life the *Ranunculus*, the *Oxalis cognata*, and the *Stackhousia obtusa* with its perfume-spreading flowers. Every week adds new colours; the scarlet *Kennedya prostrata*, the violet *Swainsonia procumbens*, the delicate tints of *Thysanotus patersonia* climbing up the dry grass stalks. The flowers of the wattle copses soon glitter in their yellow attire. The red flowers of the *Casuarina* and the *Eucalyptus odorata* hang in the air, and the white flowers of the *Bursera speciosa* mingle; the *Compositæ* bloom over the plains in all colours; and every week brings new representatives of floral beauty.

On Yorke's Peninsula are the mining townships of Wallaroo, Kadina, and Moonta, from which the chief exports are copper, wheat, and flour. On the east and south-east of the Adelaide Plains, through the hills, at a distance of twenty to thirty-five miles from the city, is a cluster of picturesque and healthy towns and townships, of which the principal are Mount Barker, Nairne, Echunga, Hahndorf, Lobethal, Blumberg, Gumeracha, and the borough of Strathalbyn. Southward, and washed by the Southern Ocean, is Port Elliott, which is largely frequented by the people of Adelaide as a cool retreat from the summer heat of the capital. At the



MELBOURNE HARBOUR.

SEA MILES

0 5 10 20

Lights—F. *Fixed*, Fl. *Flashing*,
Occ. *Occulting*, Rev. *Revolving*, Elc. *Electric*.

1893.

foot of Mount Gambier is the corporate town of Gambierton, in the neighbourhood of rich soil, partly of volcanic origin. The far-famed Blue Lake is the crater of an extinct volcano, and close by are lesser lakes and numberless caves. But the most widely-known region for caves in the colony is Naracoorte, fifty miles inland from Kingston. These are vast in extent, and, when lighted up, their variegated chambers and mazy galleries, adorned with stalagmites and stalactites, form a pageant of beauty, recalling what is depicted in the *Arabian Nights*. In past ages they were evidently haunts of marsupials, and in one of these subterraneous recesses was found, some years ago, the petrified corpse of an aboriginal. This curiosity, which was once stolen by a showman, and exhibited in Europe for gain, has been restored to its original resting-place, and enclosed within an iron railing. Twenty miles to the north-east of Naracoorte is Borderton, where the railways of South Australia and Victoria meet.

VICTORIA.

A run of 500 miles by steamer—about the distance from London to Aberdeen—from Largs Bay in South Australia, in a south-easterly direction, brings us to Port Phillip Bay, and in four hours after passing Point Nepean and Queenscliff our ocean-going vessel comes safely to moorings at the Williamstown wharf, a dozen miles from Melbourne, at present the largest city in Australasia. Victoria, lying between the 34th and 39th parallels of latitude, and between the 141st and 150th meridians of east longitude, occupies the south-eastern portion of the Australian continent, and is the southernmost colony of the Australian group. Its extreme length from east to west is about 420 miles, its greatest breadth being 250, and its extent of coast line nearly 600 geographical miles. It only constitutes a 34th part of Australia. It is less than an eleventh of the size of Western Australia, about a tenth of that of South Australia, little more than an eighth of that of Queensland, and less than a third of that of New South Wales. It is even a trifle smaller than Great Britain, comprising only 87,884 square miles. On the map Victoria has a singularly fractional and pinched appearance. It is hemmed in by the Murray on the north, and by South Australia on the west, while its eastern boundary slopes down suddenly to the sea at Cape Howe. Its obscure and insignificant position among the territorially much larger colonies by which it is overshadowed irresistibly excites wonder in one unacquainted with its history. That a colony which has produced at least three times the gold obtained from all the other Australian colonies put together, and which until recently has boasted the largest population of

all, should have so small a corner assigned to it, suggests that there was a conspiracy on the part of its gigantic neighbours, from some splenetic motive, to curtail its area to the utmost. But, happily, no such malevolent theory is required to account for the disproportionately limited share of land which has fallen to the lot of Victoria. Port Phillip was originally a parliamentary district of New South Wales, and was content to be erected into a colony with its apparatus of self government, without complaining of the comparatively narrow limits imposed upon it. As regards the land, what was lacking in quantity was more than made up in quality. Indeed, the compact, though restricted area of Victoria has secured for the study and development of its resources a degree of careful and concentrated attention which has been denied to the widespread and unwieldy areas of the other and larger colonies. The proud name bestowed upon its fertile plains and valleys by Major Mitchell, who crossed from the eastern bank of the Murray to the sea in 1835, was *Australia felix*. At the same time the whole of its interior is so immeasurably more accessible than the interior of the other colonies from the seaboard that the bulk of its farmers and traders will always enjoy a special advantage over their compeers beyond their borders in the cheaper conveyance of their produce to ports for export. Its further extension southward also imparts a more varied and genial tone to its climate than is experienced in any of the adjacent colonies. In this respect it may be said to resemble the more favoured portions of Southern Europe. For this reason it is the most suitable colony for the average English constitution. Mr. Hayter, the Victorian statist, says that in the 31 years ending with 1889 its maximum temperature in the shade was 111·2° Fahr. in January, and its minimum 27° in July, the mean being 57·4°. Upon an average, on four days during the year, the thermometer rises above 100° in the shade, and generally, on three nights during the year it falls below freezing point.

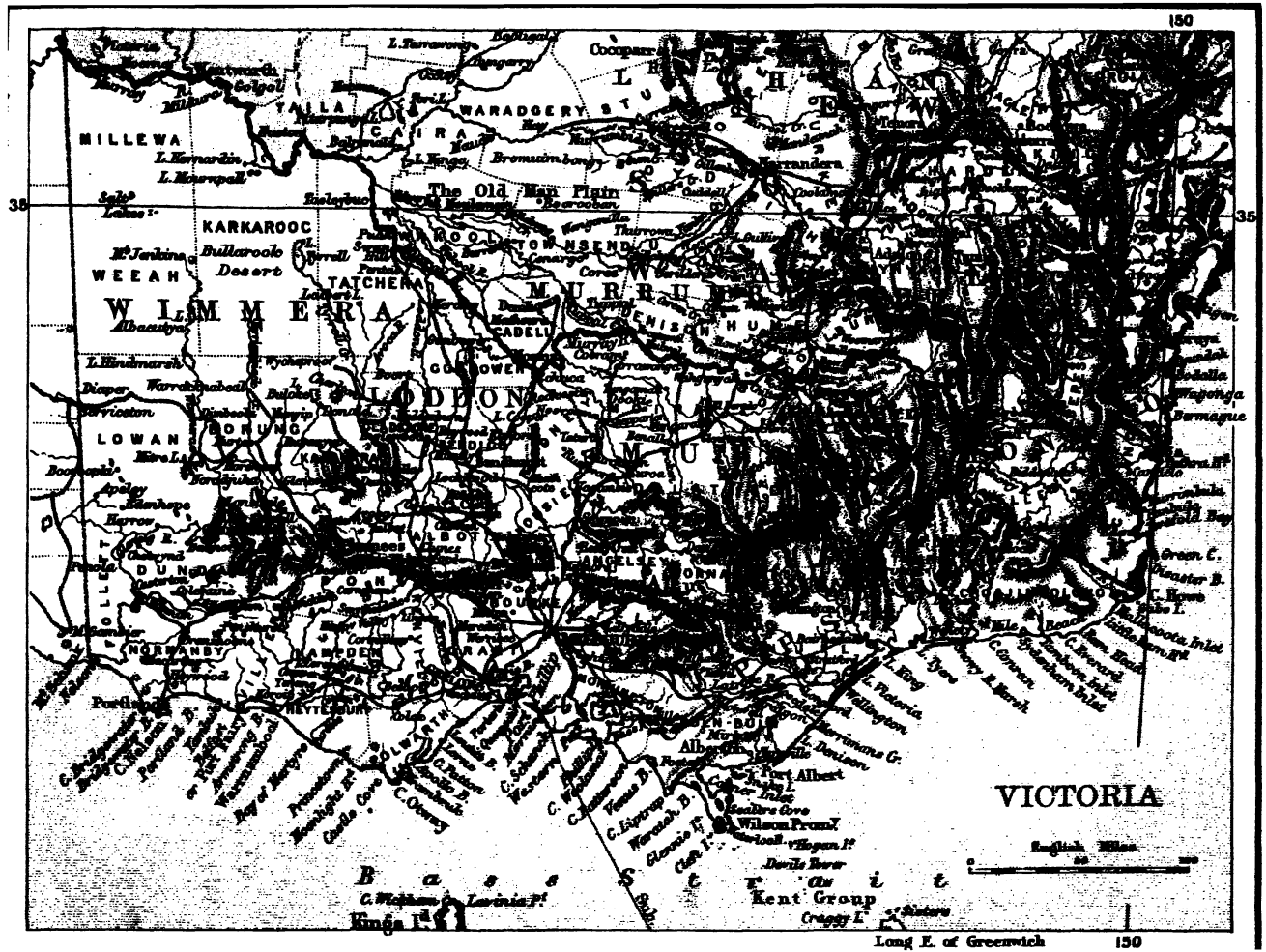
The popular idea of Australia in Europe is that it is composed of dreary arid plains, unrelieved by elevated surfaces. This view is not strictly true of any part of the continent—least of all of Victoria. It is traversed with more or less regularity throughout from east to west by a chain of mountains having projecting lines of spurs. By these mountains, which are known as the "Dividing Range," the colony is bisected. The distance of the summit of the range from the coast is from 60 to 70 miles, and the streams to the north of it flow towards the river Murray, while those to the south of it flow towards the sea. The eastern part of the range divides Gippsland from the Murray district, and is called the Australian Alps. The section of it which separates the county of Ripon from that of Berung, and continues into the county of Kara Kara has appropriated to itself from Europe the

title of the Pyrenees. For several months in the year the loftier peaks of the Dividing Range are covered with snow. The country skirting the mountains, for the most part, is densely wooded with fine timber, but above the winter snow line the peaks are quite bare, with the exception of some scattered patches of stunted trees which are to be met with. For a distance of 200 miles east of Kilmore the mountains are steep, opposing a considerable barrier to communication between districts north and south of them. The passes are few, and can only be crossed with extreme difficulty. To the west of Kilmore the range rapidly dwindles, and is easily crossed, although heights like Mount William and Mount Macedon can only be scaled by laborious effort. The highest mountain in Victoria is Bogong, situated in the county of that name, 6,508 feet above sea level. Mount Feathertop is only 200 feet lower, and Mount Hotham, the Pilot Range, and Mount Cope, all situated in the same county, are from 200 to 300 feet lower. Peaks from 5,000 to 6,000 in other directions are numerous, and many more reach 4,000 above sea level.

Navigable rivers in Victoria are but few. The Murray, which forms the northern boundary of the colony, is the largest, its total length from the source of the Darling, which is its longest tributary, being 2,345 miles. There are no other rivers that can be navigated except by boats, and even their number is small. These include the Yarra, on the banks of which Melbourne is built, the Goulburn, which debouches into the Murray, about eight miles eastward of Echuca, the La Trobe, and the Mitchell, with the unimportant Gippsland streams. All others are liable to be partially dried up and reduced to a mere series of water-holes during the summer months. A pleasing variety in the Victorian landscape is the frequent recurrence of lakes, both salt and fresh, and lagoons. The last mentioned, however, become little better than swamps in the dry season, and in some instances are craters of volcanoes long extinct. The largest inland lake is Carangamite, which covers ninety square miles, and is decidedly brackish notwithstanding that it receives the flood waters of several fresh water streams. Its strangest feature is that it has no visible outlet. Lakes Colac and Burrumbeet are beautiful sheets of fresh water, the former embracing ten and a half and the latter eight square miles. The Gippsland Lakes, Victoria, King, and Reeve, form a chain running north-east and south-west, close to the coast, from which they are only separated by a sandbelt, through which a permanent entrance has recently been cut for vessels. The largest of this group, Lake Wellington, lies more inland, and is connected with Lake Victoria by a narrow channel called McLellan's Strait. Extending south-east of Geelong is Lake Conewarre, which joins the sea at Point Flinders. Besides Port Phillip, which is the principal inlet, there is Hobson's Bay—the anchorage of the port of Melbourne—

and Corio Bay, which is the water way to Geelong. The coast line is exceptionally broken, and promontories, more or less conspicuous, are often to be met with. The extreme western projection is Cape Otway; Wilson's promontory, as previously stated, is the southernmost point, not only of Victoria, but of Australia. Cape Howe is the point at which the dividing line between Victoria and New South Wales meets the sea.

It was on the morning of the 19th April, 1870, that Cape Everard, in Gippsland, was sighted by Captain Cook, when on his way up from New Zealand to examine the shores of the newly found continent, which was supposed for a quarter of a century later to extend to the 43rd parallel of south latitude. But to Lieutenant Grant belongs the honour of having defined, in the year 1800, the entire coast line of Victoria for the first time, from Cape Bridgewater to Cape Schanck. Among other places, Churchill's Island, in Western Port Bay, was visited by him, and in cultivating a garden around his temporary "shanty" at that point, he was reduced to the necessity of availing himself of the primitive aid of a coal shovel, in the absence of any more convenient implement. Lieutenant John Murray succeeded Grant in command of the *Lady Nelson*, and reaped the first Victorian grain crop, which had been sown by his predecessor. It was Murray that, in the first year of the present century, entered Port Phillip Bay and took possession of it in the King's name. Two years later Flinders passed through the Heads into the same capacious inlet. The favourable report of Murray, confirmed by Flinders, induced Governor King, of New South Wales, to urge on the Secretary of State for the Colonies, the desirableness of forming a settlement at Port Phillip. But the good opinion of the district arrived at by His Excellency was subsequently overruled by an adverse report of Surveyor General Grimes, of New South Wales, who had been sent to examine the locality. Meanwhile, the Colonial authorities in London took prompt action in the matter on reading Governor King's dispatches, approving the introduction of population, and sent Lieutenant Colonel Collins from England, under instructions to form a settlement within Port Phillip Bay, corresponding to the one that had been established in Botany Bay, New South Wales, fifteen years previously. Collins appointed Lieutenant Tuckey with two assistants to survey the harbour, and after spending nine days in this undertaking, Tuckey wrote thus of Port Phillip:—"The kangaroo seems to reign undisturbed lord of the soil, a dominion which he is likely to retain for ages." Collins was predisposed by circumstances to indorse this view, and wrote to the Home Government:—"The sooner we are able to leave this unpromising and unproductive country, the sooner shall we be able to reap the advantages, and enjoy

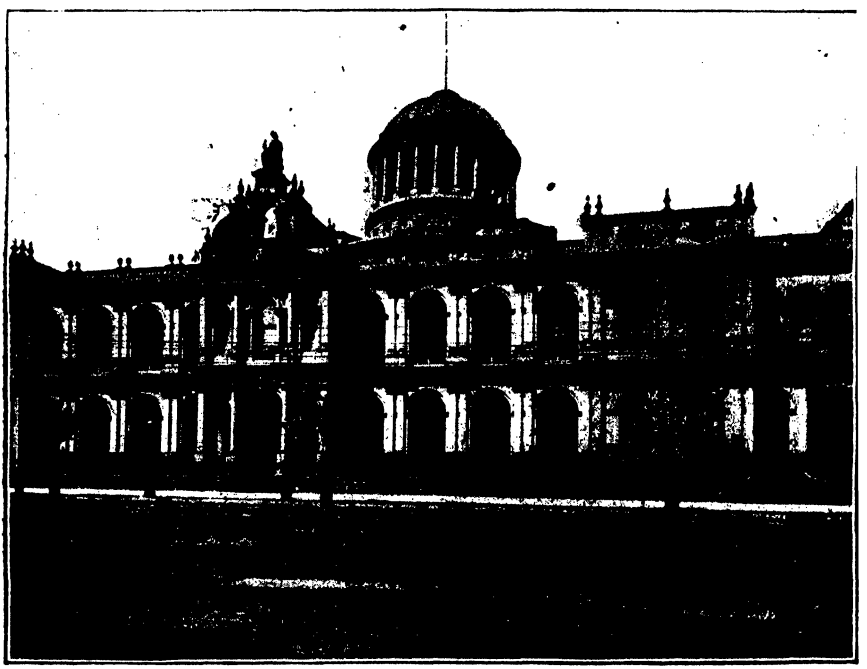

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MILLEWA
KARKAROOC
Bullarook Desert
WEEAH
WIMMERA
LOWAN
The Old Man Plain
TOWNSEND
MURRUMBIDGEE
LODDON
MURRAY
WARADGERY
YALLA
CAIRA
HAMPDEN
NORMANBY
VICTORIA
Kent Group
Long E. of Greenwich
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the comforts of a more fertile spot." Moved by the picture of desolation which Grimes, Robbins, Tuckey, Collins, and others united in painting, Governor King changed front, and stated that on further reflection he thought Port Phillip was "totally unfit for settlement." Lord Hobart, the Secretary of State for the Colonies, accordingly sent out instructions ordering the short lived convict settlement to be broken up, and transferred to Van Diemen's Land, now known as Tasmania. During the fifteen weeks of the stay of Collins' party, near the present site of Sorrento, Port Phillip, the first child of European descent was born, the first wedding was celebrated, and the first death took place in Victoria. ' How near the officers of Collins' Ship, the *Calcutta*, were to ushering in the auriferous era, which did not, however, dawn until forty-seven years later, is seen from the recorded fact that some of them found a sparkling substance in a sandy stream, which they took to be gold. For twenty years after the departure of the *Calcutta*, Victoria remained unvisited by a single ship and untrodden by a white man. It was not until 1824 that the Murray River was seen for the first time by white men. In that year Hamilton Hume and W. C. Hovell, with two stockmen, crossed the Australian Alps, discovered the upper section of the great river and passed into Victoria. Later they struck the head waters of the Ovens, the Goulburn, King Parrot Creek, and Corio Bay. The founding of the first permanent settlement in Victoria by a brave and enterprising Englishman, was due to disappointment which he had suffered in respect to the capabilities of Western Australia and Van Diemen's Land. Edward Henty, the son of a Sussex banker and landowner, emigrated with his father and brother to Launceston, Tasmania, in 1831. Edward had visited several parts of the southern coast of Australia for the purpose of ascertaining what location was best adapted for settlement. On this mission he had spent two months in examining the country in Spencer's Gulf, South Australia. Bad weather, on the return passage to Launceston, drove his vessel for refuge into Portland Bay, 266 miles west of Port Phillip. He was favourably impressed with the appearance of the country. He visited Portland again in 1833, bringing with him from Tasmania farm implements, vegetable seeds, and fruit trees supplied to him by his father. The first permanent building erected in Victoria was Mr. E. Henty's wool store, the first dwelling was Richmond House, in which he resided, and where the first child born to a European settler, saw the light. Edward constructed the first plough, turned the first furrow, planted the first vine, milked the first cow, shod the first horse, and sheared the first sheep in the colony. He and his brother Stephen, having been successful in whaling pursuits at Launceston, soon converted Portland into a whaling as well

as a sheep and cattle station. A notable figure identified with the early history of the colony was John Batman, who arrived at Port Phillip from Van Diemen's Land in 1835, and concluded a treaty with the natives on the Yarra for a grant of 600,000 acres of land, on part of which the City of Melbourne now stands. But like many other schemes of a similar kind attempted by immigrants, it was summarily disallowed by the Imperial Government. On the recommendation of the Governor of New South Wales, Batman afterwards received some compensation from the Home Government for the cancelling of his claims, but it is generally considered to have been far from adequate when the trouble, expense, and risk to life encountered by him are duly reckoned. It is no exaggeration to say that his life was in imminent peril from the aborigines, despite their professions of goodwill. The hatching of a plot to kill him was strangely revealed to him, and frustrated, by the "wild white man," William Buckley, who had been a settler in Collins' short-lived colony, but escaped into the bush in 1803, and had lived among the natives for thirty years as one of themselves, having lost all recollection of his own tongue. In the same year another veteran pioneer, John Pascoe Fawkner, also a Launceston man, organised an expedition for the colonisation of the same locality. This worthy had served, as a youth, in some capacity, under Collins on board the *Calcutta*, and knew something of Port Phillip. He came with a party of six in a fifty ton schooner and anchored on the north bank of the Yarra, opposite to the site of the present Custom House in Melbourne. Fawkner "turned the first sod, built the first house, opened the first church, and started the first newspaper in the infant settlement," which was soon to develop into a great city. As Batman was the first coloniser of Port Phillip Bay, Fawkner was equally entitled to the credit of being the father of Melbourne. In 1850 an Imperial Act was passed raising the district, which formerly sent Parliamentary representatives to the Legislature of New South Wales, to the dignity of a separate colony. In that year, which immediately preceded the one in which gold was discovered, the province of Port Phillip, still under fifteen years old, had a population of 76,000 and a revenue of £230,000; the value of its exports being £760,000. But the finding of the precious metal acted like the waving of a magic wand in powerfully accelerating its expansion. The most sanguine prophet, in his wildest dreams, could not have anticipated, from the aspect of the place forty years ago, that after that period had elapsed its population should be 1,130,000,* that the inhabitants of the capital and its suburbs should be nearly half

* As we go to press we learn that the people, influenced mainly by the severe local depression now prevailing, are leaving Melbourne at the rate of 1,000 a week for the gold mines of Western Australia.

a million, that the colony should have produced, up to date, over £220,000,000 in gold and nearly £1,000,000 in other metals and minerals, that its annual imports and exports, combined, should reach £31,389,000, that its Government revenue should be £7,729,000, its railway mileage 2,900 miles, the wire mileage of its telegraphs 8,250 miles, that the number of its banks of issue should be fourteen with £63,170,000 of assets, its savings banks 330, with about 300,000 depositors and £5,500,000 in balances, its rateable property about £105,000,000, that its manufactories and flour mills should number 3,150, its public and private schools 2,900, and

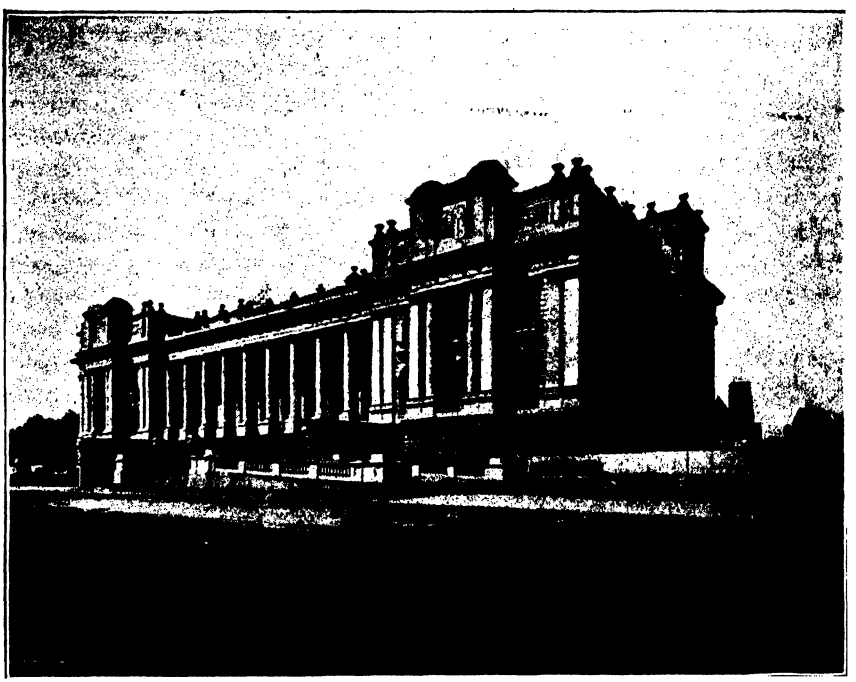


LAW COURTS, MELBOURNE.

its scholars on the rolls 300,000, that it should have 2,800,000 acres under cultivation, and 13,000,000 of sheep distributed over its pastures. As regards population, Melbourne, in the short space of fifty-six years, has risen to the rank of the ninth city of the world. After a personal inspection, Mr. Anthony Trollope described it as "one of the most successful cities on the face of the earth." Mr. G. A. Sala has applied to it the alliterative epithet—"marvellous." Another popular English writer says: "The atmosphere is one of the first things to strike the new comer;

the midday is Egyptian, the evening Mediterranean. It has been said of Melbourne, that it is Glasgow with the sky of Alexandria; but Melbourne has a peculiarity which distinguishes it from both. It is built over two parallel ridges, the valley between sloping gently northward. Along this valley, from the quays of the River Yarra Yarra to the Haymarket, at the crest of the slope, is the chief municipal thoroughfare, the site of the Town Hall, the Anglican Cathedral, the Public Library, Museum, and the Picture Gallery. If Swanston Street is the municipal—and, indeed, geographical—centre, Collins Street is the banking, and Bourke Street the shopping, centre. They run right across from the western height to the eastern, Bourke Street ending high above the valley at the front of the Houses of Parliament: Although shops and markets, banks and offices are in Melbourne, every one who can afford it lives in the suburbs. There are many of these suburbs stretching in all directions, and most of them have mayors and corporations like the mother city. The mayoralty was first established in 1842, and Melbourne became a 'city' in 1847. The casual visitor knows nothing, of course, of the political and municipal state of Melbourne. To him there is enough that impresses or surprises him in the half foreign, half-English, appearance of the place; in the magnificence of its public buildings, in the multitude of its public parks; in the strange form, and colours of its trees and flowers; and, not least, in the modifications which English habits of thought and speech have undergone in their transportation to the Antipodes. There is no distinct Victorian accent or brogue, but there is a very distinct physiognomy. The people of Melbourne present some very curious characteristics. They are very religious, and fond of sport. Ladies do not dress as in England. The horses in Melbourne are remarkable for their beauty; almost all are thoroughbred, and have pedigrees more or less illustrious. The weeds go into the city cabs and carriages, and the better sort are ridden by the wealthy youth. Hansoms have been introduced, but the ordinary hackney vehicle is a kind of one-horse waggonette. The public buildings have been mentioned, and it must be allowed that they deserve the fame they have obtained. The oldest and finest is the Post Office. It would be difficult to find a modern building in London to compare with it in proportion, or in the skill with which the principles of Jones and Burlington have been applied. The influence of Mr. Smith's design for the Post Office is very plain in the Town Hall and in the New Law Courts, a handsome edifice with a rotunda and dome very like those of the four courts at Dublin. It would be too easy to linger at Melbourne in the magnificent geological museum; in the picture gallery, where so many academy favourites of past years are exhibited; in the beautifully situated zoological gardens, where so many rare marsupials are to be seen. It would be easy to admire the views

of the city from St. Kilda to the east, or the windings of the Yarra to the west ; and no description would do justice to the surprise experienced when the narrow ' Heads ' are entered at Point Nepean. Many an ancient town of the old world has not half so much of interest to the visitor as this astonishing city of one generation." The above impressive description is correct, as far as it goes, but it has already to be materially supplemented. Since it was written many handsome buildings have been erected in the heart of Melbourne, eight and ten-storeys high, containing offices

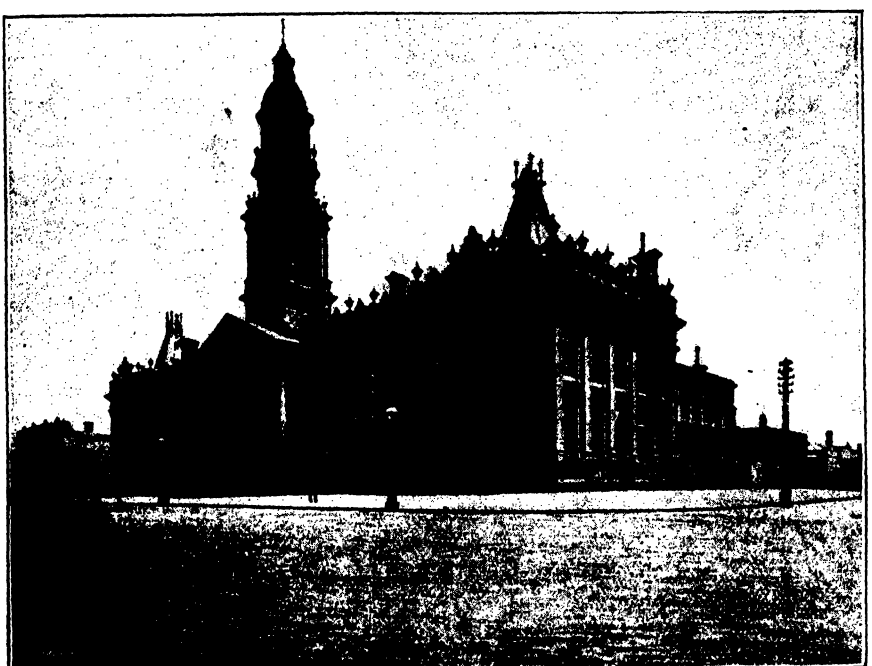


HOUSES OF PARLIAMENT, MELBOURNE.

only. These are generally provided with hydraulic lifts, for supplying which with motive power, a wealthy company has been formed. The new Houses of Parliament stand facing down the slope of Bourke Street, being thus on what is probably the highest ground within the boundaries. It is a fine rather than a beautiful building, designed by Mr. P. Kerr, in the Roman Doric style, with a colonnade of ten pillars forming a portico, and a tower and dome rising nearly 200 feet.

A few years since the local Parliament, by a special Act, authorised the

construction of traction sub-surface cable tramways through the main streets of the city, and most of the lines have been laid down by the Melbourne Tramways Trust, a body elected for that purpose by the chief city and the suburban corporate councils. The latter corporations administer the municipal affairs of five suburban cities:—South Melbourne, with a population of 38,000; Prahran, with a population of 36,000; Richmond, with a population of 32,000; Fitzroy, with a population of 32,000; and Collingwood, with a population of 30,000. From 1886 to 1889 a wide-



SOUTH MELBOURNE TOWN HALL.

spread endemic of land speculation of unprecedented force and extravagance swept over Melbourne, and extended for a considerable distance in every direction. This was caused, in a large measure, by the sudden influx of money from England, borrowed by the Government for the construction of public works, and by banking and other firms for investment. In the leading streets of some of the Melbourne suburbs, land, which two years previously could have been bought at £50 a front foot (with a depth of 150 feet), bounded up within the period, to £100 and £200

a foot. In some parts of Collins Street, an advance upon the nominal price, two years before, was £1,100 to £1,500 per foot. During the "boom" the disused premises of a bank in Elizabeth Street, sold by the bank for £33,000, were resold a few months afterwards for £45,000; and, still later, changed hands at £61,000. Many other instances, yet more romantic, could be quoted; but in 1889 a reaction began to set in which has not yet (1892) expended itself. Thousands who deemed themselves millionaires on the assumption that the bills of their co-negotiators would be honoured at maturity, have been hopelessly ruined—not only in purse, but in reputation. Numerous banks and mortgage companies were wrecked in the storm. Some of them have been hopelessly ruined, while others have been "reconstructed," with what result cannot with certainty be ascertained until a year or two shall have elapsed, in which to test their stability. The Tramway Trust, composed of the nominees of the City and Suburban Councils, have co-operated with a shareholding company in covering the areas they represent with between forty and fifty miles of tramways, which have proved, both from an engineering and, until the collapse of the great land boom, also from a commercial point of view, the most successful undertaking of the kind in the world. The fame of the chief engineer of the trust, Mr. G. S. Duncan, a native of New Zealand, is known in his own special department in both hemispheres, although it must be acknowledged that without a liberal supply of debenture capital from England it would have been impossible to accomplish results so remarkable. In addition to the public edifices previously named, there is the Great Exhibition Building which is of vast extent, and capped by a high tower from which a commanding view of the surrounding country is obtainable. It has served, with the aid of annexes, to accommodate a large collection of Victorian, Intercolonial and International exhibits on two memorable occasions, in 1880-81 and 1888-89. The latter period will long be remembered as a landmark in Australian history in connection with the Centennial Exhibition held to celebrate the close of the first hundred years after the first British Settlement was established in New South Wales. The Courts of England, the numerous exhibiting colonies and foreign nations covered no less than thirty acres of ground, and the net cost to the Victorian Government, after deducting admission fees, was £275,000. The Wilson Hall of the University, and the Trinity, Osmond and other handsome colleges affiliated with that institution ought not to pass unnoticed. Princes Bridge, a graceful and substantial structure now spans the Yarra, close to the Church of England Cathedral and the Fish Market, at the corner of Swanston and Flinders Streets. The wharves on the banks of the river are all astir with shipping—ocean-going steamers included. The "Melbourne" and "Australian" Clubs would do infinite credit to the most

illustrious cities in Europe, and hotel accommodation of late years, has been notably improved by the addition of the "Grand," the "Federal," and the "Palace," although older hotels such as "Menzies," "Scott's," and the "Oriental," are still well supported. The numerous handsome mansions in their own large and well-wooded grounds in the fashionable suburbs, plainly indicate the abounding wealth and luxury in which many of the inhabitants lived, before the advent of the financial crisis already referred to, while a large proportion of the working



WILSON HALL, MELBOURNE UNIVERSITY.

classes occupy their own freehold houses, built or bought with their savings. The arrangements for the domestic water supply of the population are ample and efficient, and every house, down almost to the smallest cottage, has its bath room. The most important reservoir is the Yan Yean—an artificial lake at the foot of the Plenty Ranges, nearly nineteen miles from Melbourne proper—the water from which is perfectly safe and pure. Parks, reserves, and public gardens in and around

Melbourne are heritages sacred to the health and enjoyment of the people, which cannot fail to charm the new comers from the crowded cities of Europe. Melbourne is liberally furnished with provident, charitable, literary, scientific, religious and social institutions to suit all classes and creeds. The Metropolis, in common with the country at large, is dotted with free and secular State Schools. To minister to their amusement the inhabitants are furnished with five well-conducted theatres, besides music halls and many flourishing musical societies. Racing, cricket, lawn tennis, football, rowing, yachting, and bicycle riding are among the most favourite recreative pursuits. The spacious Melbourne Cricket Club has, attached to it, a members' pavilion and a grand stand, with dining, billiard, and bath rooms. The city possesses two first-class race courses within a few minutes' ride by rail from the Town Hall. At Flemington, the greatest race in Australia, the "Melbourne Cup," is run on the first Tuesday in November. From every part of the Australian Continent people of all ranks flock on that gala occasion to the Metropolis. "Cup Week" is the carnival of Australia. Flemington has been called "the Epsom," and the Caulfield course "the Ascot" of Melbourne. The annual attendance at the former does not fall short of 100,000 well-dressed people on Cup day, and every form of rowdyism and disorder are absent.

Ballarat, the second city in the colony, is 100 miles distant from Melbourne, and has been appropriately called the "golden city." Nothing in the annals of mining has ever equalled the quantity of the precious metal in its vicinity in the same short space of time. In many instances, "claims," not more than eight feet square, yielded from £10,000 to £12,000. At the Prince Regent Mine as much as £16,000 was made by each of the diggers at work on it in a few months. A tubful of dirt yielded £3,225. The "welcome nugget," found in the same neighbourhood in 1858, was sold for £10,500. These marvels of alluvial mining have passed away, but Ballarat, as a civilised centre, appears more wonderful now than when gold was literally "more plentiful than blackberries." Anthony Trollope remarked of Ballarat nearly twenty years ago, that "in point of architectural excellence, and general civilised city comfort, it is certainly the metropolis of the Australian gold-fields." Its present population is between 40,000 and 50,000. The main artery of traffic running through it is Sturt Street, a thoroughfare one mile-and-a-half long, and 200 feet wide, with an imposing row of trees in the middle. On both sides are costly public buildings, of which the city hall, post office, theatre, hospital, mechanics' institute, and several churches are most prominent. Efforts have been made to complete the Anglican Cathedral, which, however, do not seem to have gone much beyond the initial stage. The reservoirs, which supply the community with water, have a

storage capacity of 600,000,000 gallons, the cost of the works being £300,000. Lake Wendouree—on the banks of which is the Bishop's palace—is one of the most charming attractions, especially when it is seen—as it often is—with hundreds of small yachts, miniature steamers and rowing boats, and anglers fishing for perch, trout, and carp, with which it is stocked. The botanical gardens grace one side of the lake, and are neatly laid out and well kept, while several creditable monuments to the "mighty dead" appeal to the reverence of the young. By a strange economic freak—chiefly due to the protectionist policy of the colony—in this locality, so far from a port, eight iron foundries and locomotive manufactories have made for themselves "a local habitation and a name." Wheat and wool of superior quality are grown close by. The educational establishments number two colleges, four grammar, ten state, three denominational schools, and a government school of mines. There are three respectably conducted daily newspapers, and one weekly, published. Over eighty-four miles of admirable streets have been constructed and ornamented with trees, and 170 miles of footpath are now made and channelled. The existence of thirteen breweries and distilleries, in so limited a population, shows that the English taste for malt liquors has not been extinguished under a semi-tropical sun. Although the miners of Ballarat were the victims of gross misgovernment, early in the "fifties," and hunted down by an armed police, so cruelly that they were compelled to defend their rights and their lives behind the historic Eureka stockade, all trace of resentment against the errors of the government of that ill-starred period has long disappeared, and a more loyal and law abiding population is nowhere to be found. Mining around Ballarat has long been reduced to a prosaic occupation; the men employed in it are confined to "reefing," which is carried on in depths from the surface ranging to 2,200 feet. Bendigo, a town a little over a hundred miles from Melbourne, is also dependent for its support upon gold mines. Its population is a few thousand under that of Ballarat. For many years it was called Sandhurst, but within the last two years, at the wish of the great majority of the inhabitants formally expressed by a *plebiscitum*, the name by which it was known at first has been restored. It is the headquarters of an auriferous country of quartz formation, and from its apparently inexhaustible character it is likely to continue to be a source of prosperity for many years to come. The town is traversed by 100 miles of streets and about 1,000 quartz mining leases are held in the district, covering an area of more than 18,750 acres, 160 mining plants being within the municipal boundaries. The main street, Pall Mall, abounds with shops and warehouses of brick and stone. Facing Pall Mall is an important looking structure, erected by the government, consisting of public offices. The public halls are respectively known as

town, masonic, temperance, and St. James'. There is a mechanics' institute with library of about 7,000 volumes, several branch banks, a savings bank, a hospital, and a benevolent asylum. Following the universal municipal habit in Australia, three recreation reserves have been set apart in the city, Rosalind Park, Weeroona Park and lake, and the Botanical Gardens, the latter beautifully designed and planted with choice shrubs, added to which there is a varied collection of foreign animals and birds. The streets are adorned with eighty miles of trees and the visual effect is specially grateful in a mining centre. Besides gold mining the industries followed are represented by pottery, granite cutting and polishing, tanneries, brick and tile works, railway carriage works, coach building, and cordial factories and large iron foundries. Vine growing and farming may be regarded as staple pursuits in the suburbs. Bendigo has nineteen churches; one of these belonging to the Church of England having a peal of bells of superior tone. The gold mines afford employment to 6,500 miners, and their operations are carried on with the help of 260 steam engines. These operations extend over 144 square miles of country. At the Local School of Mines instruction is given in the various branches of science allied to mining, and in many other subjects of general interest to those in quest of useful knowledge.

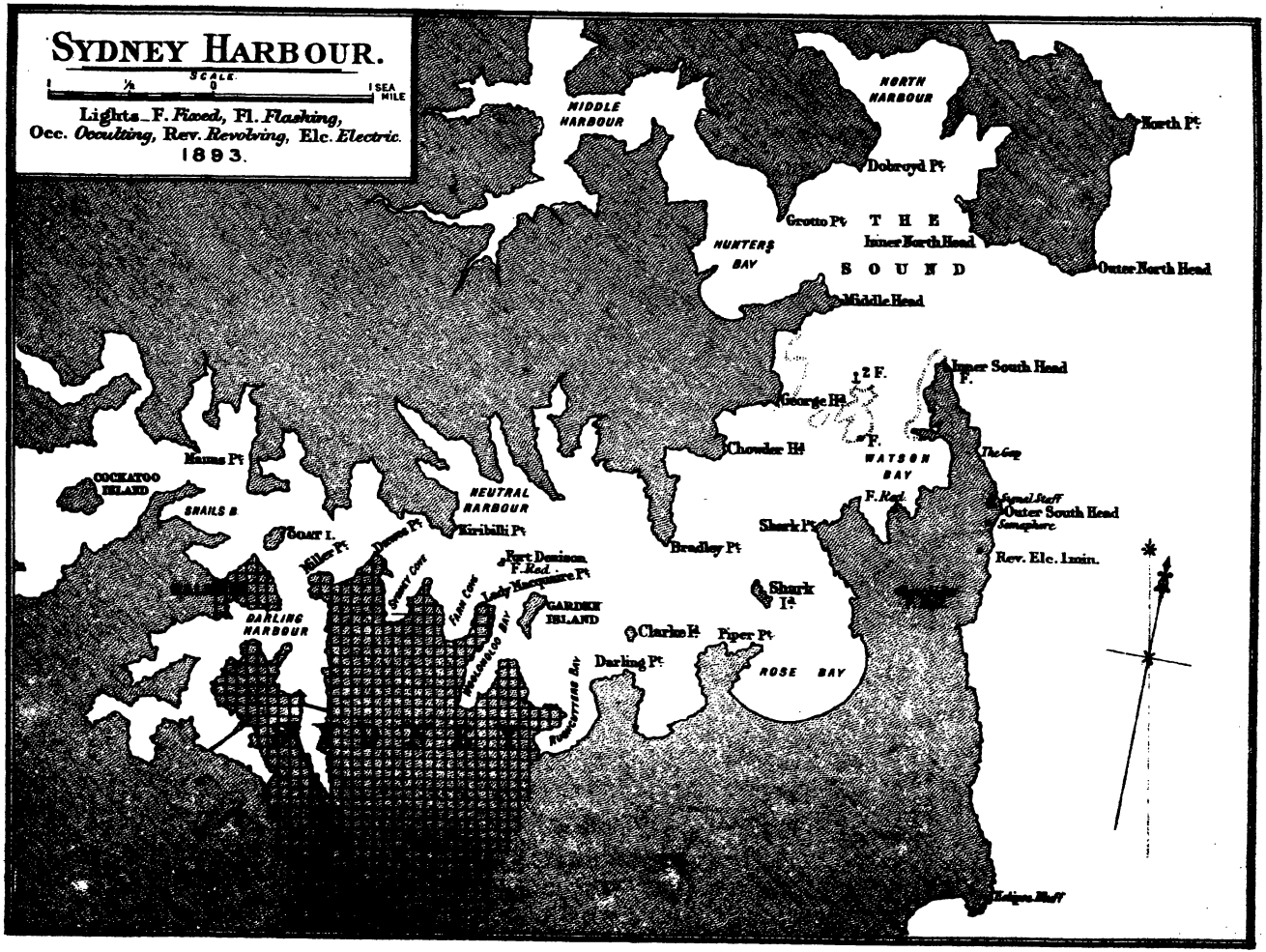
Geelong stands fourth in the grade of importance among the towns of Victoria, and is picturesquely situated on the shores of Corio Bay. Having a rich back country it threatened in early days to contest with Melbourne the crown of supremacy; but an unmanageable bar in the bay proved an insuperable impediment to shipping, and the Victorian capital quickly outstripped its temporary rival. Its population, which has been greatly reduced, is not much over 20,000. It is one of the oldest municipalities in Victoria, and lies forty-five miles south-west of Melbourne. It is built on ground sloping to the bay on the north side, and to the river Barwon on the south. Its exhibition building, town hall, and other public erections, are quite in keeping with the general well-to-do appearance of the place. Its public gardens are laid out in excellent taste, and ships of the largest tonnage can load and discharge at its jetties, and the increased facilities now given for shipping wool direct to England from the wharves, have led many growers and buyers to avail themselves of the saving thus effected. The vine flourished in the district for many years, but *phylloxera* having invaded it, the Government proclaimed Geelong a diseased viticultural area, and all its vines were destroyed. But there is now some prospect of the grape resuming its position as a valuable local product. A number of other industries are in full operation. Castlemaine, Clunes, Warnnambool, Hamilton, Maryborough, Beechworth, Stawell, Echuca, have each distinctive

features of interest peculiar to them respectively, which cannot be dwelt on here. But it is impossible to visit them and other localities that might be named without being impressed with the splendid future in store for Victoria, if only the colony can avert the damaging influence of political partisanship and reckless speculation.

Not the least important and interesting settlement in the colony is Mildura, on the south bank of the Murray, about forty miles from Wentworth, in New South Wales, which is on the opposite side of the river. The object of the promoters, Messrs. Chaffey Brothers, was to reclaim, by irrigation, 250,000 acres of land which had been declared by the Agricultural Department of Victoria unfit for pasturage or cultivation. Barely seven years have passed since the township of Mildura was surveyed, and, already, several thousands of persons have fixed abodes in urban and rural sections of the estate. Many thousands of acres have been planted with agricultural and horticultural crops. Those whose enterprise has founded and carried out the undertaking had conducted a similar scheme to successful issues in California, and it is somewhat surprising that Australian skill and application have not yet been equal to the establishment of irrigation works on the same scale elsewhere in the colony.

NEW SOUTH WALES.

Sailing from Melbourne, the next headlands between which our steamer passes, about 500 miles distant, in a north-easterly direction, form the entrance to the far-famed Sydney Harbour, leading up to the capital of New South Wales, the terminus of our voyage. The transformation scene which bursts upon us when we contrast the busy and thriving aspect of the country and the population to-day, with its sterile appearance and the throng of nude savages lining the beach when Captain Arthur Phillip's ships anchored in the "Cove" on the 26th January, 1788, cannot fail to thrill the most phlegmatic nature. The aboriginal has retreated before the advance of civilisation, and the surrounding heights which knew no dominion 104 years ago but that of the kangaroo and himself, are now adorned far and wide with the emblems of comfort, wealth, industry, and art, the well-earned rewards of indomitable British skill, persistence, and enterprise. Although Captain Cook gave to the colony the name it still bears and was the first to hoist the Union Jack on its coasts, and to awaken absorbing interest in the possibilities of its development by the published narrative of his voyage, he had no part in selecting the site of Sydney. It was the small and shallow anchorage of Botany Bay, a short distance from Sydney harbour, that was discovered and recommended by him as the location of a new colony. But, despite the profusion of new plants with which Botany Bay teemed, much to the delight of


SYDNEY HARBOUR.
SCALE.
½ 0 1 SEA MILE
Lights—F. Fixed, Fl. Flashing,
Occ. Occulting, Rev. Revolving, Elc. Electric.
1893.
MIDDLE HARBOUR
NORTH HARBOUR
North Pt.
Dobroyd Pt.
Grotto Pt.
THE
HUNTERS BAY
Inner North Head
SOUND
Outer North Head
Middle Head
Upper South Head
F.
2 F.
George Hd.
Chowder Hd.
F.
WATSON BAY
The Gap
Signal Staff
Outer South Head
Semaphore
Rev. Elc. 1min.
F. Red.
Shark Pt.
Bradley Pt.
Shark Is.
Clarke Pt.
Piper Pt.
ROSE BAY
Darling Pt.
Robertsons Bay
Macleays Bay
Hodgsons Bluff
Mosman Pt.
COCKATOO ISLAND
SNAILS B.
NEUTRAL HARBOUR
Kirribilli Pt.
Dawes Pt.
Miller Pt.
Fort Denison
F. Red.
Macquarie Pt.
Sydney Cove
Farm Cove
Woolloomooloo Bay
GARDEN ISLAND
DARLING HARBOUR

Banks, the naturalist of Cook's expedition, the shores were far from fertile; good water was scarce, and the spot was found by Phillip, on his arrival eight years after the visit of the great explorer, to be in every way unsuitable for a colony. Curiously enough, Cook saw the inlet known ever since as Port Jackson, and it was from him it received the name it bears; but, for some unexplained reason, he refrained from entering the most capacious and lovely of Australian harbours. An exceptional conjunction of events favoured the attention of the Government and people of England being directed to New Holland, as Australia continued for some time to be called. The parent state was inclined to feel more than usual interest in so valuable a discovery as that of Cook, when it happened to occur, from the fact that the North American colonies had just been irretrievably lost by a successful rebellion. Forecasts were made at the time of the prospective greatness of the new appanage to the Crown. There was a conviction from the first in the minds of the officers of the pioneer fleet commanded by Phillip, of His Majesty's Secretary of State, of Viscount Sydney, and of reflecting persons in the colony itself, that the seed of a mighty nation was being planted. The prophetic lines of Erasmus Darwin, botanist, physiologist, and poet, have been often quoted, and are singularly pertinent, as showing what were the wishes and aspirations of the intelligent portion of his fellow countrymen at home in regard to the future of New South Wales. His poem, which is entitled "The visit of Hope to Sydney Cove," proceeds thus:—

'Where Sydney Cove her lucid bosom swells,
Courts her young navies and the storm repels?
High on a rock amid the troubled air
Hope stood sublime and waved her golden hair,
Calmed with her rosy smile the tossing deep,
And with sweet accents charmed the winds to sleep;
To each wild plain she stretched her snowy hand,
High waving wood and sea-encircling strand.
'Hear me,' she cried, 'ye rising realms! Record
Time's opening scene and Truth's unerring word.
There shall broad streets their stately walls extend,
The circus widen, and the crescent bend;
There, ray'd from cities o'er the cultured land,
Shall bright canals and solid roads expand;
There the proud arch, colossus-like, bestride
Yon glittering stream, and bound the chafing tide;
Embellished villas crown the landscape scene,
Farms wave with gold and orchards blush between.
There shall tall spires and dome-capped towers ascend,
And piers and quays their massy structure blend;
While with each breeze approaching vessels glide,
And northern treasures dance on every tide.'
Then ceased the nymph—tumultuous echoes roar—
And joy's loud voice was heard from shore to shore—
Her graceful steps descending pressed the plain,
And Peace and Art and Labour joined her train."

The predictions of Darwin have been fulfilled with striking exactness in a much shorter time than he probably anticipated, but not without an amount of British endurance, energy, and resource which verifies the saying that "truth is stranger than fiction." It is in the light of history that the remarkable foresight of the poet can be best appreciated. Never was a colony founded under conditions more adverse to the realization of poetic hopes or patriotic aspirations. There were times when the settlement was reduced to the verge of starvation and commercial ruin. These extremely unpromising circumstances add to our astonishment at the order, intelligence, respect for law, social comfort, political organization, and triumphant industrial achievement which have been evolved out of the original chaos. The population of New South Wales, which for many years after the gold discovery lagged far behind that of its vigorous neighbour, is now reported to be some thousands ahead of Victoria. Nor can it be doubted, if its position and resources be considered, that it must ultimately outvie, in numbers and wealth, for a considerable time, at least, all the other existing colonies of Australia. There is in it a stronger backbone than is possible in any of the sister communities, for the obvious reason that it had the advantage of a slow, steady, and solid growth for nearly half a century before most of the others were born. The law is the same in the building up of national as of animal and vegetable structures; maturity and strength are best attained by quietly progressive development. With less than a quarter of million people, New South Wales contains an area of 310,700 square miles, a territory two and a half times the size of the United Kingdom. Embraced between the 29th and 36th parallels of south latitudes and 141st and 153rd meridians east, its surface is divided naturally into three distinct zones, differing widely from each other in general character and clearly defined by the main dividing range of mountains which traverses the country from north to south. This range runs almost parallel to the coast at a distance of 100 to 150 miles. Its summit is formed by tableland, on the eastern edge of which the mountains rise abruptly to a height averaging between 2,000 and 3,000 feet. On the western side they slope gradually towards the great central plain. It is close to the boundaries of Victoria, in the south-eastern portion of New South Wales, that we meet with the geographical centre of the whole mountain system of South-Eastern Australia. Some of the peaks in that region measure over 7,000 feet in height above the level of the sea. The watershed, proceeding from the tableland dominated by this cluster of lofty mountains, is distributed into three distinct river systems. The eastern extends through the whole length of New South Wales and Queensland, draining into the Pacific. The western system is drained by the Darling and the Murray into the Southern Ocean.

The southern watershed is the source of the Snowy River, which enters the sea near Bass' Straits. The appearance of the south-east portion of the colony is marked by indications of some great upheaval in a primæval age. The mountains are rugged, and their slopes abrupt. This description also applies to other portions of the Dividing Range, particularly in the Blue Mountains and the eastern parts of New England. The principal summits of the latter reach an elevation of 4,100 feet. Those who have enjoyed a trip through this district, *viâ* the Great Western Railway, will remember the Clarence siding, Mount Victoria, Mount Wilson, and Blackheath stations, which are situated at a height of over 3,000 feet. The Dividing Chain decreases materially in bulk when it divides the waters of the Goulburn and the Hunter on the eastern slope from those of the Namoi and the Castlereagh on the western. Again the mass broadens in the Liverpool ranges, where Mount Oxley towers to a height of 4,500 feet, and Ben Lomond, still further north, reaches 5,000 feet. The average altitude of 3,000 feet, in consequence, gives to the region, although not a great way from the tropics, the climate of lower levels in latitudes much farther south. There are no snow-capped peaks reflecting magnificent hues at the touch of the rising and the setting sun, as in some parts of the northern hemisphere. But if we glance from the edge of the high tableland into the deep valleys below, we are profoundly impressed with the stupendous scale on which Nature has worked in these solitudes. The valleys and sides of the gorges are here and there clothed with dense vegetation, and over all is that matchless drapery of blue haze visible from Sydney, which has given to the range its fitting name. Bordering on South Australia, in the extreme west of New South Wales, is another mountain system which forms the west edge of an immense depression. The great Barrier and the Grey Ranges are a sub-division of this system. It is only on the south-eastern slopes of the Snowy Ranges and on the high peaks of the Australian Alps that snow sometimes lingers throughout the year. A comparatively rare sensation awaits the visitor within a few miles of the inland towns of Goulburn, Queanbeyan, and Braidwood. On the summit of the Dividing Range two of the principal lakes of the colony are visible. Lake George, at an altitude of 2,200 feet above the sea, is 16 miles long and 6 miles in width, receiving the drainage of an area extending 490 square miles, and though standing so high the scenery around it is very beautiful. Perhaps the most notable phenomenon connected with this fine sheet of water is that, large as is the area it drains, it is without a visible outlet. Similar in the latter respect is another depression in the summit of the same range, Lake Bathurst, a few miles to the eastward, which covers, in ordinary seasons, an area of 15 square miles. In periods of great drought both lakes shrink

considerably in extent, but the aspect of Lake George is least affected, and now that the railway to Cooma skirts its margin it has become a favourite resort for tourists.

Having regard to the limited number of navigable rivers in Australia, New South Wales possesses a liberal share of these. Compared with the western rivers those on the eastern slope are insignificant; but compared with the principal rivers either in England or France their relative size and importance are at once apparent. The Tweed and the Brunswick flow through a rich country of semi-tropical aspect in the north, but they are only navigable for small craft. The Richmond flows down the slope of Mount Lindsay, one of the peaks of the northern tableland. This river has three branches, being navigable to Casino, 62 miles, and on Wilson's Creek to Lismore, 60 miles from the sea. The Clarence, the largest river on the Eastern Watershed is immediately south of the last-named stream. It runs 240 miles through one of the richest districts of the colony. The lower section of the stream averages half-a-mile in width from its mouth for nearly 50 miles, and ocean-going steamers of large tonnage can ascend as far as Grafton, 42 miles from the sea, while it is navigable for smaller vessels for 67 miles to Copmanhurst. The Macleay, a leading coastal river, traverses 200 miles of country from its source, passing through alluvial plains and valleys, which are fast becoming the homes of a thriving population. The Hastings and the Hunter are less important, commercially; but the Hunter, which has its source in the Liverpool range, is one of the chief streams in the colony. Its tributaries are numerous, and in many cases large. It is navigable for ocean-going vessels 34 miles from the sea to Morpeth. Through its lower channel it drains the coalfield of greatest magnitude in Australia, whose centre is at Newcastle, the second city in New South Wales in shipping and commerce. The Hawkesbury, though inferior to the river last-mentioned, in an economic point of view, is formed of the united waters of many streams, its chief tributaries descending from the tableland and gorges of the Blue Mountains; it thus passes through some of the grandest scenery in Australia. Navigation is already possible as far as Windsor, 70 miles from its mouth, and it only requires a little dredging to enable sea-going vessels to reach that distance. The Shoalhaven, the Moruya, the Clyde, the Tuross, the Bega, and the Zowamba, merit notice, which want of space, however, unavoidably precludes. It is hardly necessary to say that the Murray is the main river of the Western Watershed. From the confluence of the three rivers which are its sources, it rapidly descends below Albury on the plains, where the height above sea-level is only 490 feet. Thence to the sea its course measures 1,439 miles. Above Albury it is fed by mountain torrents caused by the melted snows of the Australian Alps. In

its lower course the Murray is swollen through the Murrumbidgee and the Darling by the waters of secondary systems. The total length of this main artery of Australia is 1,719 miles, 1,132 of which are within the colony of New South Wales. The river has been navigated to a point about 150 miles above Albury, 1,590 miles from its mouth. The Lachlan is the chief tributary of the Murrumbidgee, and of all the subsidiary streams which augment the Murray, the Darling drains the largest area. For over 1,000 miles this noble river pursues its lovely course, as a sort of local Nile, feeding the thirsty plains of the south with water carried many hundreds of miles to the downs of Queensland. In times of freshets the Darling is navigable 1,758 miles from its junction with the Murray. Including the distance from that neighbourhood to the sea, its total navigable length is 2,345 miles; but its upper channel is open only during part of the year. The lakes of the western district are both less important and less interesting than those situated on the eastern tableland.

With a topography so diversified it might naturally be expected that climate would vary with latitude and altitude. But the records of temperature, extending over many years, conclusively prove that the climate of New South Wales is exceedingly temperate and uniform. The greatest temperature ever experienced in the shade in Sydney was 106·9°, the lowest in winter, 36·8°. The mean temperature is about equal to that of Naples, but in the latter city the summer is warmer and the winter colder than in Sydney. When we ascend to the tableland a change in climatic conditions is immediately experienced. The town of Kiandra, standing at an elevation of 4,640 feet, has a mean summer temperature of 54·5°, and a winter temperature of 33°, corresponding with that of Dunfermline in Scotland, which is in latitude 56° 5′ N., Kiandra being, however, in 35° 5′ S. On the New England tableland the climate cannot be surpassed anywhere. If dryness were not a ruling characteristic of the atmosphere, the interior of the colony in seasons of abundant rains would, long ago, have become an impenetrable jungle, the breeding ground of malarial fevers which infest, with fatal effect, fair regions in many other parts of the globe.

Any description of New South Wales would be absurdly incomplete without some notice of a class of scenery which lends peculiar enchantment to Australian wonderland—the caves of New South Wales. These are entitled to rank among the most marvellous natural phenomena in the world. The Jenolan, formerly better known as the Fish River Caves, would well repay a visit from the tourist. They are distant about 36 miles in a direct line from Bathurst, on the Great Western line of railway, and 145 miles from Sydney. Usually a party is formed, and Mr. Wilson, the official keeper of the caves at Oberon, is communicated with two days before the

intended visit. A train from Sydney at 10 a.m. conveys passengers to Tarana, which is reached in time for the coach to convey them to Oberon, where they can find hotel accommodation. A couple of hours' drive will bring the excursionists to their destination next day. Another route much favoured is by way of Mount Victoria. Coaches next morning start for the caves in time for afternoon inspection, and there is no lack of charming scenery *en route*. The Jenolan Caves are stalactite and stalagmite formations of vast extent. The New Cave, when illuminated by the magnesium light, is a scene of extreme loveliness, the appearance of a heavy fall of snow being produced, with rocks in the background which one could, at first sight, imagine to be a black and threatening sky. In the Bell Cave six strangely formed stalactites hang close together, and when these are struck they give out sonorous tones somewhat resembling a chime of bells. A series of large chambers connected by narrow passages contain massive stalagmite formations, a pool of singular clearness, a large apparently white mantle, fine "shawls" of semi-transparent stalactite, and some very pretty pillars. The Imperial Cave, 500 feet high, has a swift underground river, not the least sensational of the cave sights. The Easter Cave is the most fascinating of them all. There is, however, a whole group of others, consisting of splendid subterraneous halls and bewildering galleries, forming, when illuminated, a gorgeous spectacle "filled with delicate pendants and drooping sprays, gigantic columns and shadowy arches, all resplendent with dazzling illusive gems." Space cannot be afforded to convey the faintest conception of these natural marvels, including the Belubula Caves in the Bathurst district, the Wellington within half a mile of the Macquarie River, the Yarrangobilty, 12 miles north of Kiandra, the Wombeyan in the western district, the Kybean south-east of Coomba, the Bendithera in the parish of Uranbena, county of Dampier, and the Bungonia in the parish of Inverary, county of Argyll.

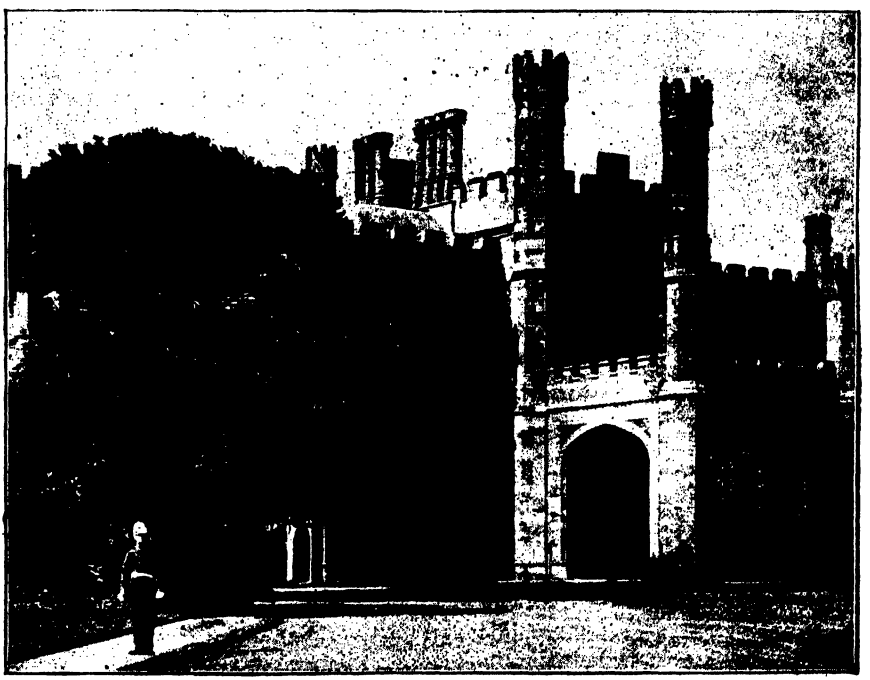
The total value of exports and imports of New South Wales in 1892 was £42,748,700, the imports slightly exceeding the exports. Varied and remunerative as the many resources of New South Wales are, its staple products still are, as in times past, sheep breeding and wool growing. The number of sheep in the colony exceeds 55,000,000, the increase being about 20,000,000 in 10 years, despite the appalling losses frequently occurring from drought. These losses often amount to upwards of 2,000,000 sheep, and seven years ago 8,138,000 perished from the cause named in a single year. There seems no remedy for this intermittent scourge but the sinking of artesian wells, the practicability of which is now beyond dispute, as water seems to be found without difficulty if only the boring is deep enough. The climate of the eastern seaboard, for a considerable distance inland, is too moist and

the soil too poor for the effective breeding of merinos. It is after crossing the coast range that the grazing and wool-growing capabilities of the country become apparent, and further to the westward a still greater improvement is visible. The latest statistics available give the total weight of wool for the year above mentioned at over 300,000,000 lbs., and its market value at about £11,000,000. The other principal exports comprise gold (including coin, bars, and quartz) £3,205,000, silver about £2,000,000, live stock £1,250,000, copper £310,000, and timber, dressed and undressed, £127,000. The total amount of coal raised in the year approximates 4,000,000 tons, of which upwards of 2,500,000 tons are exported, the value of which is more than £1,125,000. Kerosene shale is obtained, but finds a somewhat fluctuating market. Meats and extracts, butter, fruits, sugar, tobacco, maize, wine, flour, and wheat, however, are in great demand. No attempt was made to work the deposits of diamonds and other gems previous to 1884, when a company was formed to develop the mines at Bingera. The number of diamonds found in the colony up to the end of 1887 was estimated at 75,000, the largest being 5⅝ carats, or 16·2 grains. The deposits are known to be extensive, but have not yet been thoroughly prospected. The diamonds of New South Wales are pronounced by experts to be harder and much whiter than the South African diamonds, and are classified as on a par with the best Brazilian gems. In 1889 the Malacca Company, near Tingha, found diamonds weighing 2,195⅝ carats, valued at £858. These and other precious stones are not confined to the New England district, but are found in many other parts of the colony, and Dr. Böhme, a geologist of some merit, has obtained from the surrounding countries specimens of the whole series of gem stones known to commerce.

Gold mining in New South Wales has never commanded the application of capital and skilled industry to the extent which the wide distribution of the precious metal would seem to justify. Still there is a tendency of the number of men employed on gold mines to increase. Out of a total of 30,000 men engaged in mining of every description, about one-third are devoted to seeking for gold. Although the alluvial diggings discovered in 1851 have been practically abandoned as exhausted, the highest mining authorities are convinced that the surface of the country has been merely scratched. New fields and fresh discoveries are being continually met with in localities—notably, of late, Wyalong, near Barmedman, 313 miles from Sydney—supposed to have been thoroughly examined. Many successful quartz-reefing companies are working quietly and paying handsome dividends. Even within the last 20 years 1·02 cwt. of gold was raised in a certain mine from 10 tons of quartz, and a slab of vein stuff and gold from the same mine,

weighing 630 lbs. and estimated to contain £2,000 worth of gold, was also exhibited. Another company in the same year raised from 436 tons 2 cwts. of stone 24,079 ozs. 8 dwts. of gold, valued at £93,616. The chief quartz veins are contiguous to Bathurst, Avondale, Hill End, and in the Mudgee and Cudgegong goldfields. The last named up to the end of 1889 had yielded 1,099,808 ozs., or over 33½ tons of gold, valued at £4,267,469, and on the authority of the geological surveyor it is stated that it is, as yet, far from being exhausted. Within the New South Wales border, adjacent to South Australia, silver mines are being worked which bid fair to rival, in some instances, the famous Comstock lode on the Pacific slope. Within the past five or six years a population of nearly 30,000, almost wholly supported by the working of the Broken Hill lode, has been gathered in and around the site of the future silver city. The Proprietary Mine alone employs 2,545 men, of whom 1,412 are engaged underground. The receipts from mine products for the six months ending 31st May, 1891, totalled £1,135,569, of which sum £576,000 was paid in dividends. Since the commencement of the mine in 1885, and up to the date just mentioned, there had been extracted 25,728,591 ozs. of silver, and 107,038 tons 9 cwts. 2 qrs. and 22 lbs. of lead, the total gross value of which was £5,913,292. Cash dividends and bonuses were paid within the same dates amounting to a total value of £2,744,000, which, with sums received by the company for the sale of several blocks adjoining the mine, make a grand total of £5,064,000. Many other silver mines in the neighbourhood, though of secondary importance compared with Broken Hills Proprietary, are making excellent returns, and not alone in that particular locality. The total value of copper produced in 32 years was £5,818,338, and a number of cupriferous mines are still doing well. In 19 years the total value of tin exported from the colony has been £9,255,384. The stanniferous deposits extend over at least 5,440,000 acres, and the number of men at work in them does not exceed 2,525, including Chinamen. The existence of extensive iron deposits has been abundantly demonstrated in all directions, but owing to the cost of plant for smelting furnaces, and the difficulty of securing the necessary skilled labour, very little has yet been done towards developing this important source of wealth. Up to the end of 1890 the value of the antimony produced was £93,741, and would have been much larger but for the imperfect methods hitherto devised for separating the gold with which it is usually found amalgamated. In addition to the silver lead which is exported from New South Wales in enormous quantities, there are widespread deposits of galena which have not received the attention they deserve. It is only the cost of transit to the coast that prevents valuable manganese and chromite ores from being profitably worked. In the Broken Hill district and many other

places bismuth has been found in the tin-bearing drifts and also in lodes; but, although the total yield up to the present has realised £35,835, this metal is not worked advantageously for want of proper concentrating appliances, the result being that a large proportion of friable, earthy carbonate is lost in manipulation. Platinum has recently been discovered for the first time in a lode formation near Broken Hill, and assays have shown its presence up to an ounce per ton in the lode stuff. Wolfram, cobaltiferous manganese, mercury, asbestos, and alum have been discovered, and satisfactorily reported on.

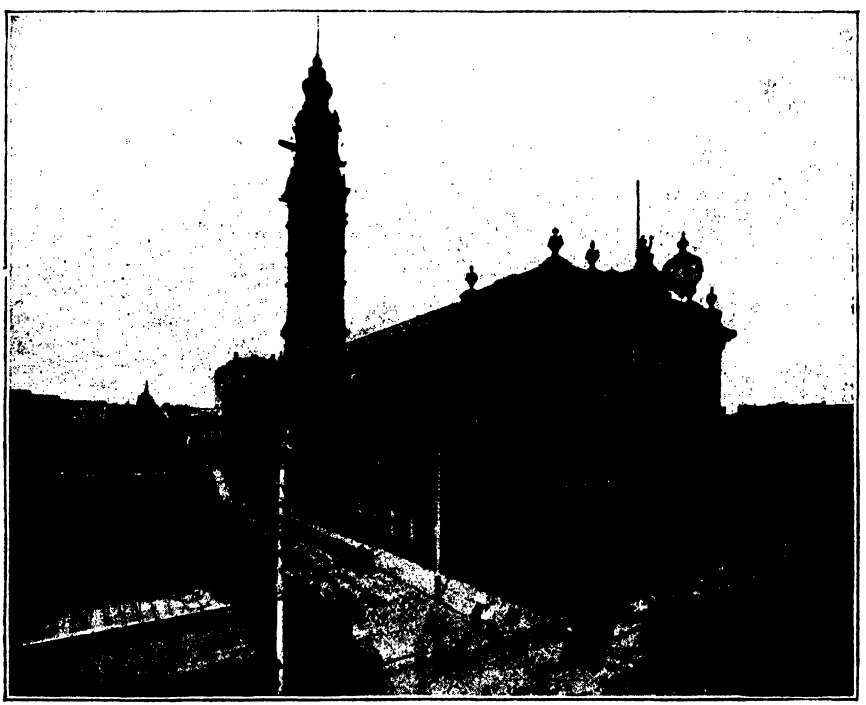


GOVERNMENT HOUSE, SYDNEY.

A glance at the more prominent towns in New South Wales must conclude this necessarily rapid survey. Beginning with the capital and seat of government, the approach to it for beauty cannot be surpassed, if even equalled, in any country. Port Jackson is not a uniform expanse of water, but is broken up in all directions into capacious open-mouthed bays by the numerous promontories jutting into it. Each of these bays is a harbour in itself, and some of those on the northern side are

a continuation of other harbours or rivers which are navigable for several miles. These inlets encircling the city—all differing from each other in shape and size, as if when they were fashioned Nature chanced to be in one of her most frolicsome moods—have the advantage of enabling the very heart of the city to be reached by water. Its name is appropriately commemorative of the Under Secretary of State who first suggested the idea of establishing a colony in New South Wales, soon after the territory was taken possession of for Great Britain. Mr. Jackson changed his name and became Sir George Duckett. The public traffic of Sydney and the suburbs is carried on by railways, steam tramways—which, it is expected, will ere long be converted into the cable or electric system—hackney carriages, omnibuses, and hansom cabs. Water communication, by means of numerous ferry boats, is maintained day and night between the city and its trans-marine suburbs, Balmain, North Shore, Manly Beach, and other localities. In some of its features Sydney bears a more striking resemblance to an English town than any other city in Australia. Some of the streets are narrow, tortuous, and devoid of pretension to modern architectural standards. A large proportion of the houses have what, in the English sense, would be considered a "homely" look, although in recent years the work of reconstruction has been begun and continued in earnest. Fine public and private structures are ceaselessly replacing the incommodious and sometimes unsightly buildings with which earlier colonists were content. Indeed, the city has already become so transformed as to be almost unrecognizable by those familiar with its earlier features. Weather-board and galvanized iron erections have been superseded by palatial buildings more in harmony with the growth of private wealth, public taste, and cultured surroundings. Street corners that were formerly occupied by public houses are, in many instances, adorned by tall, spacious, and ornate structures devoted to banking, insurance, and mercantile purposes. Brick is extensively used, but in buildings of magnitude, public and private, stone is the favourite material, granite and polished marble being largely used in ornamental detail. In country towns stone or white brick is used, according to the nature of the locality, the stone being obtained from native quarries in common with a considerable portion of the marble. The leading thoroughfares are laid out according to the cardinal points of the compass, intersecting each other at right angles. Among the public buildings Government House is one of few which were not designed in the colony, being planned by Mr. Blore, the architect of the front part of Buckingham Palace, London. It is about sixty years old, and if the state rooms are of somewhat small proportions they are lavishly decorated, and the private rooms for the Governor

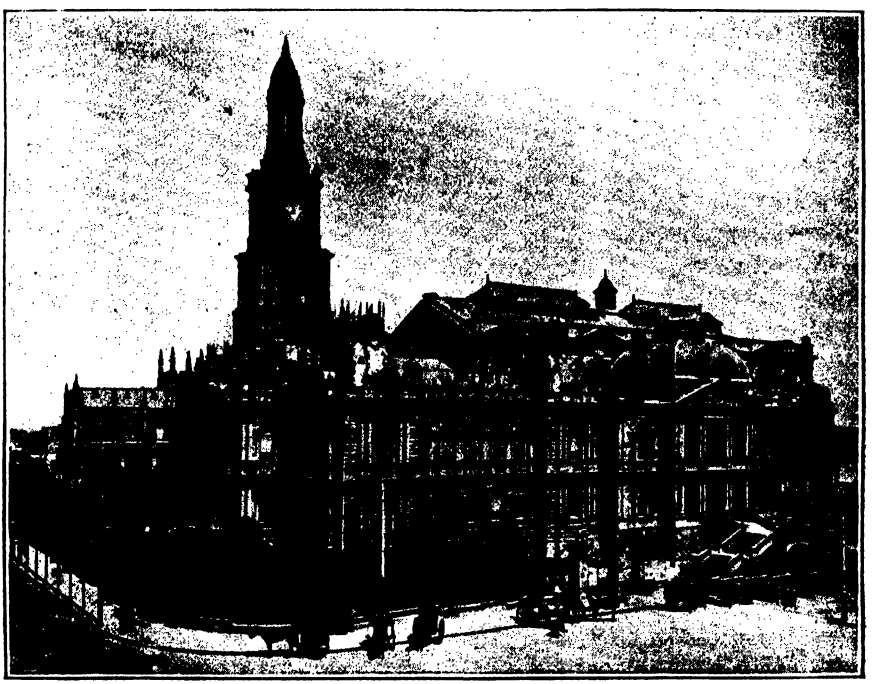
and his household are fitted up with every regard to comfort. The vice-regal residence is pleasantly situated in the midst of a fine English-like park, planted with graceful shrubberies and ornamental gardens overlooking the waters of Sydney Harbour. The Lands Office consists of a pile of Pyrmont freestone, presenting a frontage to Bridge Street of about 200 feet, with a depth of 280 feet to Gresham and Loftus Streets respectively. There is another frontage to Spring Street, about equal in length to the one in Bridge Street. The building is erected in the



POST OFFICE, SYDNEY.

composite order of architecture, and is distinguished by a broad colonnade running round the entire first floor. It possesses a large octagonal copper dome, which rises to a height of 100 feet above the pavement. A tower above the roof, with an elevation of 245 feet from the pavement, is surmounted by a copper cupola. Its estimated cost is £200,000. The General Post Office is a noble and stately pile, with three massive-looking frontages, 78 feet to George Street, 353 feet 3 inches to

Martin Place, and 108 feet to Pitt Street. It has a total altitude of 240 feet from the pavement to the top of the tower. The large dials of the tower clock can be illuminated at night by gas or electricity. There is a peal of bells from designs by Lord Grimthorpe, and it is stated to be the best peal of bells that ever left England. The offices of the Colonial Secretary and the Secretary for Public Works are accommodated in a building whose large proportions and splendid position mark alike the importance of the edifice and the expansion of the colony. The museum



TOWN HALL, SYDNEY.

is a meritorious piece of Corinthian architecture, built of freestone, and the main elevation reminds one in some degree of the British Museum, although it is, of course, on a much smaller scale. The Sydney University is a grand pile of buildings in the perpendicular Gothic style of the fifteenth century. It is erected near the Newtown Road, at the southern end of the city. Its main feature is a spacious hall, 140 feet long by 47 feet in width and 70 feet in height, with

a roof which displays a magnificent specimen of the carver's art. This hall was described by the late Anthony Trollope as follows: "I think no one will dispute the assertion when I say that the college hall is the finest chamber in the colonies. If I were to say that no college either at Oxford or Cambridge possesses so fine a one I might, perhaps, be contradicted. I certainly know none of which the proportions are so good." The public library, the Sydney Exchange, the town hall, the Church of England and Roman Catholic Cathedrals, the public parks, gardens, and monuments, all, without exception, do infinite credit to the ability of those who designed them, and to the taste of the public authorities who selected the plans from which they were constructed. The number of daily and weekly journals, mostly well-conducted and highly remunerative, reflect as much the intelligent interest in public affairs of those who support them as the enterprise of those who control them.

Under the influence of coal-mining, Newcastle, 100 miles to the north of Sydney, has developed into a great industrial and shipping port, with an urban population of 20,000, the residents of the district numbering 71,000. In addition to its export of coal, it has become an important depot for the export of wool to foreign and English ports. It possesses one of the most spacious railway stations in the colony, and is well supplied with churches, schools, hospitals, and other kindred institutions, being at the same time the seat of a bishop of the English Church. It has tanneries, shipbuilding yards, factories, foundries, and engineering establishments, and seems to be perpetually throbbing with industrial life. Parramatta, next to Sydney, is the oldest town in the colony. It is situated on what is called the Parramatta River, which is really an elongation of Port Jackson. Its population is estimated at 12,000. The district is mainly devoted to fruit-growing, and the orangeries and orchards of the locality have a world-wide reputation. It can boast what are believed to be the largest orange trees in the world. The number of towns scattered up and down the colony, mostly supported by pastoral or agricultural industries, and ranging in population from 2,000 to 8,000 inhabitants, is one of the strongest evidences of the soundness of the basis on which the colony rests, and the surest presage of its increasing advancement and prosperity. Several gold-mining towns created by their proximity to alluvial diggings, as in Victoria and California, have blossomed suddenly into activity for a while, and when their auriferous treasures were exhausted they have relapsed into obscurity. But towns with a productive agricultural country behind them, and facilities for getting produce to market, and especially to the coast, are destined to progressive growth.

QUEENSLAND.

The traveller proceeding northward to Brisbane from Sydney has now the option of reaching Queensland by railway or steamer. Indeed, if speedy transit be an urgent consideration, he may leave the boat which brought him from England at Largs Bay, in South Australia, and continue his journey from Adelaide to the capital of Queensland by train all the way—a distance of more than 1,500 miles. The colony we are about to visit penetrates far within the tropics, extending from 29° to 10° south latitude. It is 5½ times larger than the United Kingdom, measuring 1,300 miles from north to south, and 800 miles from east to west, while its coast line runs in a north-westerly direction for 2,250 miles. Within a distance of 100 to 200 miles from the coast a mountain range divides the colony into two unequal parts from north to south, the narrower portion being on the east or coast side, and the more extensive on the west. There are several smaller ranges creating subdivisions of territory in other parts of the country. Only two mountains, however, exceed 4,000 feet—both on the coast range—but the average height of the Queensland mountains is 2,000 feet. There is a dearth of navigable rivers, and none of much importance except the Fitzroy, which is the largest, and can be navigated for 35 miles from its mouth. On the long line of coast there are many harbours, but none to compare in importance with Moreton Bay, which receives the waters of the Brisbane and five smaller rivers, being 40 miles long and 17 miles broad. Cape York, the northernmost point in Queensland, is separated from New Guinea by the Torres Straits. Queensland embraces a large part of the Gulf of Carpentaria. The extreme northern coast is studded with hundreds of islands, many of which present attractive features.

The city of Brisbane—situated 500 miles from Sydney, and 1,000 from Melbourne—is in latitude 27° 30′ south on both banks of the Brisbane river, about 12 miles from its entrance in Moreton Bay. It has a population of 51,689, or, including its suburbs within a 5 mile radius of the General Post Office, of 73,649 persons. It is the seat of a considerable number and variety of manufactories, and the centre of a busy and thriving agricultural community, with a large and growing commerce. The river has been so much deepened that steamers of 6,000 tons can load and discharge cargo at the wharves. The progress of Brisbane is marked in the size and character of its buildings, and it lacks no institutions which are essential to social or mercantile life. Its clubs represent a large amount of intelligence and culture, and its philanthropic and charitable foundations are worthy of an open-hearted people. Although the entire population

of Queensland still falls considerably short of 500,000, no less than 3 daily and 11 weekly newspapers are published in its chief city. Twelve miles from Brisbane in a direct line, on the Bremer, is Ipswich, the second oldest town in the colony, having about 8,000 inhabitants in the municipality, and 10,000 in the district. A grammar school, churches, banks, and tri-weekly journals give an air of stability to the place, especially when we take into account the industrial establishments it contains, such as flour mills, saw mills, clothing factory, woollen mill, and foundries, that find employment for many bread winners. Gympie, the earliest mining town in the colony, is 100 miles north of the capital. Its municipality numbers 8,000, and the district named after it about 12,000. It is connected by rail with Brisbane and also with Maryborough, the latter place being on the Mary river, and 180 miles to the north of Brisbane. Maryborough is surrounded by country extensively devoted to the production of sugar and agriculture generally, but Mackay is recognized as the chief centre of the sugar industry, having 23 sugar mills and 3 distilleries. Rockhampton, 34 miles up the Fitzroy river, is the principal town of Central Queensland, and the starting point of the Central Railway, which now extends inland for about 358 miles. Rockhampton lies 420 miles north-west of Brisbane, and has a population of 10,800. Townsville, in Cleveland Bay, is the leading city in Northern Queensland, and the seaport of a large and productive locality in sugar growing, grazing, and mining, about 870 miles from Moreton Bay. Hence the Northern Railway extends westward 236 miles. This place is the episcopal seat of the diocese of North Queensland, and has a chamber of commerce, grammar school, botanical gardens, and other appurtenances of a high civilization. Among other large towns are Charters Towers, reached by rail from Townsville—Herberton, the great tin mining centre, connected by a similar medium of transit with the port of Cairns, and Normanton, the latter being the natural outlet of the regions far north, Toowoomba—a favourite health resort for sufferers from pulmonary affections—Warwick, Roma, Stanthorpe, and Dalby—all in railway communication with Brisbane—also give promise of immense increase.

Within the large area covered by the colony there is necessarily a great diversity of climate. Speaking generally, the rainy season throughout the colony occurs in the months of January and February. In the tropical portion there is a well defined "rainy season" from January to March. In the south the rains are more generally distributed over the year; the winter is usually dry and bracing, especially upon the highland plains west of the coastal range. For at least eight months out of the twelve the climate of Queensland is exceedingly bright and exhilarating, closely resembling that of Madeira. In a recent year, the total rainfall

at Brisbane was 42·37 inches, distributed over 144 days. During the greater part of the year the weather is fine, the sky cloudless, the atmosphere dry and elastic. The summer months, though hot, are not sultry or oppressive. The winter season, when dry—which it almost always is—is beautiful and agreeable. The cold is felt in the mornings and evenings, but during the day the air is warm and balmy, the sky brilliantly blue, and the atmosphere singularly transparent. Health is the natural result of these conditions. It is well known that latitude is no infallible index to climate. Sufficient rainfall, and its equable distribution over the year, the nature of the soil and vegetation, the undulating surface of the land, the prevailing winds and sea breezes on the coast, all enter into the production of climate. Over large sections of Queensland these conditions are favourable. The mean temperature in the shade at 9 a.m. at Brisbane during a recent winter was 60·4, 55·5, and 55·1 in May, June, and July respectively. In the summer months, December, January, and February, the heat was 76·6, 78·3, and 75·5 respectively. The northern half of the colony is within the tropical zone, but as malaria cannot live in the presence of the gum tree which prevails here, as in other Australian colonies, the climate, no matter what may be the degree of its heat, is not unfit for European labour. British colonists are actually able to engage in farming and mining within the tropics. The temperature in summer is moderated by the prevalence of south-east trade winds blowing off the cool ocean. Epidemics are rare, and diseases incident to childhood are usually mild in character and short in duration. Sunstroke is uncommon, and the death-rate in 1889, which was 15·44 per thousand, compares favourably with most other parts of the world. It must be admitted, however, that tropical industries, especially the growing of sugar, have been seriously hindered, owing to the opinion of the majority that the climate of localities suitable for that industry in the country can be best endured by Kanaka labour, and to the persistent refusal for many years of the Government, of which Sir Samuel Griffith was a member, to admit that species of labour, except under conditions which were virtually prohibitory. But in February, 1892, previous to his elevation to the judicial bench, that gentleman receded from the austere attitude he had so long assumed towards the question, and issued a manifesto intimating his willingness to allow labour contracts for Kanaka immigration. Under this long-sought concession, the cultivation of sugar and other tropical resources has received a powerful stimulus.

Taking the products of the colony in the order of their financial importance, gold stands at the head. It is no exaggeration to say that, although auriferous mining in Queensland has not yet attracted the measure of attention which it merits, the richness and extent of the gold discoveries of the colony are without

parallel. Gympie takes the foremost place among the goldfields of Southern Queensland, and has been in course of development since 1868. It is 61 miles from the port of Maryborough, and supports a highly picturesque town of 10,000 inhabitants. In 1889 there were 75 registered companies in this field, and the greatest depths reached in the mining shafts sunk was over 1,500 feet. The returns from this entire gold-bearing district, from its discovery until December, 1889, amounted to £5,411,661. The work of prospecting has been successfully carried on in the Burnett district. On the Eidswold field, in the same year, 13 registered companies distributed dividends amounting to £14,250. The most extraordinary of all gold discoveries in the world is, however, that of Mount Morgan, rendering comparatively valueless all previous geological and mining experience. It is 1,225 feet above sea-level, embedded in the heart of a surrounding chain of hills, and is 22 miles distant from the port of Rockhampton. The Government geologist of the colony has stated that the pure and fine quality of the gold—which is worth £4 4s. per oz.—obtained from this source, is due to the fact that in past ages the water of a sort of geyser within what is now Mount Morgan, held the gold in solution, and that the particles were afterwards precipitated and consolidated with the other mineral matter thrown up by the spring into a ferruginous stone. The present machinery is equal to crushing 1,500 tons weekly. A return of five ozs. to the ton is looked forward to for many years. On that basis of calculation the gross annual output of gold should be £1,638,000 a year; but it is doubtful if this anticipation will be fully realized. The ore being very refractory, is treated by the chlorination process, which saves 97 per cent. of the metal. The number of distinct reefs proved to be auriferous in the northern goldfields is 460, and the extent of ground of this character worked in this field is 120 square miles. The yield of Charters Towers and the Cape River goldfields, since their discovery, is considerably more than 2,000,000 ozs., or about £8,000,000. Without further specifying numerous other sources in Queensland from which gold is being extracted, the total yield for the whole colony is at present but little short of £3,000,000 per annum, and during the whole period since the precious metal was discovered in 1858, is about £26,000,000. It is believed that if the large amount annually smuggled out of the country by Chinamen could be ascertained this total would be proportionately increased. Under the influence of rewards offered by the Government for the discovery of new payable goldfields, fresh finds of gold and other metals and minerals are taking place almost daily, in widely different parts of the colony. The collective quantity of copper raised between 1860 and 1889 was valued at £1,954,247. In the period named the total value of tin, alluvial and from reefs, obtained throughout the colony was £3,653,960.

Queensland possesses silver in Silverfield, Ravenswood, Star River Field, Sellheim Field, and Herberton, of the richest description, and in the ten years from its discovery to 1889, 29,054 tons of ore were treated, yielding £420,072. Extensive deposits of iron, quicksilver, manganese, cobalt, antimony, and plumbago have already been found, and as regards coal the resources of Queensland may be said to be practically inexhaustible, if the researches of accredited experts are to be relied upon. Its carboniferous area has been estimated at twice the size of England, but the portion worked, up till now, has been insignificant.

The pastoral interest next invites passing notice. Probably no colony has so large a surface of good grass land as Queensland, and with the exception of the limited area reserved for farms, near towns, the country is at the disposal of flocks of sheep, herds of cattle, and horses. The "runs," rented by squatters from Government, extend from 100 to over 1,000 square miles of country, and carry enormous numbers of sheep, cattle, and horses. The Darling Downs are the most suitable for sheep. Cattle are depastured all along the coast on the Warrego and Marianoa Rivers, and North Gregory, Burke, and Cooke districts. Among the attractions which Queensland offers to the grazier and the squatter, are salubrity of climate, comparative immunity from cattle disease, extensive range of territory, abundance of natural grasses, increasing facilities of transit, and excellence of wool. The difficulty mainly to be fought is scarcity of water; but this is certain, sooner or later, to be overcome. It can no longer be doubted that underneath the surface there exist vast reserves of pure water, which have only to be tapped by artesian boring in order to become available. Important as cattle-grazing may be, wool is the most profitable product of the pastoral interest, as in other Australian colonies, and the clip now closely approaches £3,000,000 a year. At the same time there is a market assured in England for refrigerated meat, and for essences and extracts of meat, which is capable of great expansion. But it is only by agriculture on a broad scale that the largest proportion of wealth can be reaped from the soil, and be most widely distributed among the people; and nothing strikes a visitor with more surprise than the unlimited agricultural capabilities of the country resulting from the diversity of its soil and climate. Stretching far west and south-west from Toowoomba on the high table-lands of the Darling Downs, both temperate and semi-tropical products can be grown to perfection. On the one hand, the orange and the grape flourish in that section of the country; on the other hand, crops so widely different as wheat, maize, mangel-wurzel, potatoes, apples, pears, and strawberries, with English fruits and vegetables. The soil on the Darling Downs is of volcanic origin, and varies in colour. But the central districts, even as far north as Charters

Towers and Herberton, though not altogether of the same character as the vast sweep of country that has been mentioned, are hardly less suited to the successful culture of cereals, vines, and orchard fruits. The whole length of the coast lands is found well adapted for sugar, cotton, arrowroot, coffee, and rice, with the pine-apple, the banana, the peach, the orange, and the grape. The limestone soil of West Moreton, and the basalts of other parts form excellent farming ground. Most farmers obtain two crops of potatoes in the year. Occasionally the summer crops are liable to failure, but they are generally sound and of excellent quality. There is, unfortunately, a drawback to the cultivation of wheat; it is sometimes liable to a disease called "rust." Many attempts have been made both to prevent and cure it, but with only partial success.

The sugar industry, without doubt, is destined to attain great proportions, although the vicissitudes to which it has been subject, consequent upon droughts and labour difficulties, have been sufficiently trying to extinguish the ardour of the strongest believer in its future. But circumstances all round are fast becoming more favourable for its profitable development. As it expands the labour employed in it will, probably, be sub-divided, as must also be ultimately the case with the manufacture of wine and dairy produce. The tendency now, as regards wine, is for owners of vineyards to confine their attention to the grape culture, and for the pressing, stoning, and distributing of the juice to be a distinct branch of business. So with the production of butter. The custom is growing throughout Australasia of setting up creameries in farming districts. To these the milk of cowkeepers in the neighbourhood is brought, and they are paid for it at the creameries or butter factories according to its properties for dairy purposes. Tobacco of good quality may be grown in any part of the colony, and experts have pronounced the Queensland product to be fully equal to the real Virginia leaf. At present the demand for this article is understood to exceed the supply, and several factories in connection with the industry are in satisfactory operation. Cotton grows easily, and produces abundantly. Bee farming has, within recent years, occupied considerable attention, and the Beekeepers' Association of Brisbane is doing much to disseminate knowledge of methods of treatment adapted to the colony.

The wealth of Queensland in indigenous timbers is varied and extensive. The wood exhibits from the colony, which the writer had an opportunity of inspecting at the Centennial International Exhibition held at Melbourne in 1887-8, amply exemplified the fact that the colony possesses timbers suitable for every description of carpenters' and cabinet-makers' work. The Queensland court, on the occasion referred to, was fitted up with Bunya-Bunya pine (*Araucaria bidevillii*), a wood

only found in that colony. One of the most useful species is red cedar, which is in increasing demand for cabinet work, having the reputation of being very durable and impervious to attack from the white ant. The supply is still abundant, although it has to be brought from places at present difficult of access. Nine species of yellow wood are found in Queensland, three of which extend into New South Wales. The "Moreton Bay pine" is a valuable variety. The timber known as "Cyprus pine" is met with all along the coast, and is prized for cabinet work, while the species found inland is applied to the construction of telegraph posts, the wood being seldom attacked by the destructive white ant. The "she pine," a handsome and erect tree, is useful for spars, being soft and elastic, and is also adapted for joiners' work. A white light timber is furnished by the "Leichardt tree," which grows in North Queensland. "Pencil cedar" and "satinwood" are applied to economic uses, and the "silky oak" is in great demand for the staves of casks. A Queensland timber of the greatest utility is the "beech," which has the advantage of being strong, easily worked, and not affected by change of weather, and it is much enquired for to construct verandahs, floors, and decks of vessels. "Hardwood" is the product of various eucalypts, including "ironbark," "spotted gum," "blue gum," "bloodwood," "stringy bark," "turpentine," "blackbeet," "Brisbane box," and "scrub ironwood," the latter wood being the hardest grown in the colony. It may be hoped that, under the care of a department of forestry, the immense timber resources of Queensland will be conserved. It is certain that if the industry be judiciously regulated, it will prove an inexhaustible source of revenue to the Government. The mainstay of the colony has hitherto consisted of raw products, and it is only of late years that manufactures have, to any extent, been entered upon. There is evidence, however, of the latent wealth which enterprise and capital may be expected to develop by means of manufacturing industries.

The numerous and excellent harbours on 2,250 miles of coast offer great facilities for internal trade, while external commerce between rapidly growing local seaports and those of other colonies is fostered by three steamship companies. In 1892 the total exports from Queensland were £9,170,408, and the imports £4,382,657. In 1890 the direct exports to the United Kingdom amounted to £2,417,955, and direct imports from the latter country to £2,124,845. The geographical position of Queensland is well suited for commerce with countries so variously situated as China, India, and California. In June, 1892, 2,353 miles of railway were open for traffic, and 16,981 miles of telegraph wire in operation. The public is served with 12 joint stock banks, and about 200 branches. During 1889 these were entrusted with £10,182,387 in deposits from the public, and their assets were estimated at

£20,670,618. Some of these institutions, with others devoted to business in finance and land have, unfortunately, been adversely affected by the prevailing depression. The Government savings banks, at the end of the same year, held £1,597,784 to the credit of 43,875 depositors. Educational and useful social institutions abound on all sides. The state school system is free, secular, and nominally compulsory. Musical and scientific societies and schools of art evince the artistic and intellectual aspirations of Queenslanders. Athletic sports and games of all kinds are well patronized, and hospitals and other philanthropic societies are supported partly by public subscription and partly by Government subsidy.

TASMANIA.

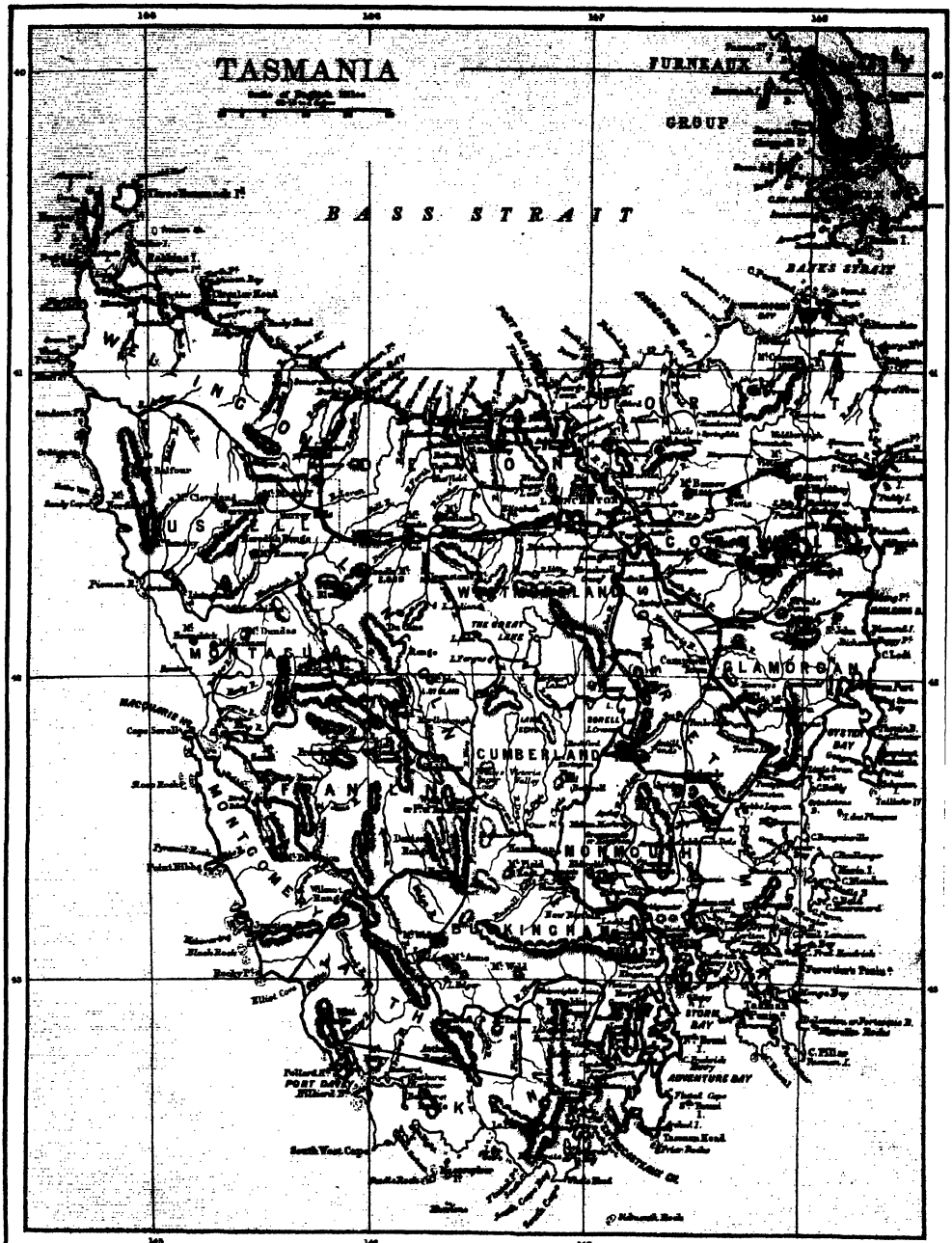
"If a quarter of Ireland were cut off, the remaining three-quarters would, as nearly as possible, represent the size of Tasmania." The substantial accuracy of this description of the island, which is now to engage our attention, is only equalled by its brevity. If Ceylon may be metaphorically represented as "a pearl hanging on the brow of India," Tasmania may be not inaptly represented as a gem suspended from the neck of Australia. But substituting historic fact for poetic figure, the island actually stands in parental relation to the colony of Victoria. Batman, the founder of the Port Phillip settlement, the Hentys of Portland, who were its pioneer agriculturists and sheep farmers, and Fawkner, the father of Melbourne, migrated from the island to Port Phillip early in the thirties. Tasmania originally bore the name of Van Dieman, the enlightened Dutchman who sent out an expedition to explore "the Great South Land"; but as to Tasman, who commanded that expedition, belonged the distinction of having discovered the island in 1642, it was deemed only just that its final and permanent designation should be Tasmania. In 1772 it had a narrow escape of being annexed by the French, two French vessels having reached it in that year. But it was allowed to remain long afterwards unappropriated until at length its occupation by the British was commenced by Lieut. Bowen, who arrived from Sydney with a party of soldiers and settlers in 1803, and established his quarters at Risden on the Derwent, a few miles from Hobart, the present capital. It is well-known that Tasmania, with trifling exceptions, contains the same species of plants and animals as prevail on the mainland, the aboriginal race—now defunct—not excepted. A comparison of the geological formations in Australia and on the island, demonstrates that the small detached territory, distant but a few hours' sail from the Australian coast, formed part of the continent in the remote past.

Other Australasian colonies and some distant countries may boast of a lovely climate in some parts, and at certain seasons, but Tasmania is in the proud position

to assert this privilege for every part and every season. Meteorological observation, covering a term of years, shows that the average mean temperature of spring is 54°, that of summer 62°, that of autumn 55°, and that of winter 47°, giving a maximum difference between the average mean temperature of summer and winter of 15°. The vitalising power of the atmosphere, as indicated by the ozonometer, is great, the result being that zymotic diseases hold a very obscure place in the local bills of mortality. But, perhaps, a more practical proof of the equable character of the climate than is given by the thermometrical range, is that the clothes which keep one warm enough in winter are not unbearable in summer. "How shall I describe," says Sir Edward Braddon, "the balminess of that air which makes him who breathes it feel a pleasure in merely living?" The death-rate, pure and simple, is rarely, if ever, a correct measure of health conditions in a community. Even tried by this test, however, Tasmania is more favourable to health and longevity than England, and ranks third in the Australasian mortality lists, New Zealand showing the smallest rates, and South Australia standing second.

"Tasmania," says the *Handbook*, "is a mountainous country, having a hundred hills ranging in altitude from 1,000 to nearly 6,000 feet." It is really a hilly country throughout. Both on high tablelands and in the valleys extensive stretches of level country may be found, but the prevailing contour is undulating. For beauty of site Hobart is almost pre-eminent among capitals, being built on more hills than Rome itself, and wherever one journeys throughout the island the eye encounters mountains in the landscape, more or less near, sometimes snow-capped in winter, and always attractive to the artist from their graceful outlines and the splendid effects upon them produced by the alternating play of light, mist, and shade. Scenery is to be met with in every variety. The best bits of choice English counties are reproduced between Launceston and Deloraine. The snug homesteads, the orchards, the fields rich with wheat crops, the hawthorn hedges, with here and there a small plantation, are charming duplicates of England. The north-west seaboard vividly reminds one of scenery on the coast of Cornwall. The valleys of the Derwent and the Tamar will vie with some of the finest views on the Rhine. The streams are suggestive of Scotch rivers, and, like them, they are the habitat of trout and salmon. It would be claiming too much for this lovely isle, however, to say that the sombre hue of its eucalypts and the thin foliage of the smaller trees can for a moment compete with the full-leaved elm, beech, and oak in England when these are attired in their summer livery.

Tasmanian lands naturally fall, as elsewhere in Australasia, into a threefold division—agricultural, pastoral, and mineral. Of the first class a large portion yet


TASMANIA
FURNEAUX
GROUP
BASS STRAIT
BANKS STRAIT
WELLINGTON
CUMBERLAND
MONMOUTH
PORT DAVEY
ADVENTURE BAY
STORM BAY

remains under the undisturbed dominion of the primæval forest, and the area put under cultivation proves, as a rule, to contain rich soil. Every marketable plant and cereal which can be grown in the parent country flourishes in Tasmania. Every tree and shrub indigenous to England takes kindly to the colony as its adopted home. On the other hand, the vine, the fig, and other semi-tropical products which can only bear fruit in England under artificial devices, there come to maturity without the shelter of glass. Wheat yields, on an average, 18 bushels to the acre, potatoes $4\frac{3}{4}$ tons, and on the north-west coast the average rises to 15 tons to the acre. A notable advantage in favour of the Tasmanian agriculturalist is that he enjoys a happy immunity from such ruinous droughts as are frequently experienced on the Australian continent. Besides, he possesses, in the lakes on the highlands, sources of irrigation which may soon become available in times of need. The progress of Tasmania in the last dozen years has been unmistakeable. Excellent roads have been substituted for what had previously been dangerous quagmires. When the railways for which surveys have been made are completed, these, added to lines already in active operation, will amount to a total of 470 miles in length. The estimated public revenue for 1891 was £808,346, and the estimated expenditure £793,206. These figures show an advance in both items in the decade of about £300,000. The population has always been slow in its rate of increase compared with other Australasian colonies, but it is proportionately free from those morbid reactions to which a sudden increase invariably leads. According to the latest census, the number has reached about 150,000. It is easy to perceive that its numerical development has been retarded by the inducements offered to young and adventurous spirits who, impatient of the Arcadian simplicity and quiet by which, until recently, Tasmanian life has been marked, have eagerly joined in "rushes" to localities on the mainland where gold or silver mines are ever and anon being discovered. Tasmania has deservedly been called "the garden of Australia," and the significance of that title is being brought home more forcibly every year by the increasing cargoes of splendid apples produced in the island, which are distributed from Covent Garden to eager purchasers all over the United Kingdom, in April, May, and June, when fresh fruit cannot be obtained in the northern hemisphere. There is room for much more attention to be profitably bestowed upon orchard culture and upon the art of packing fruit for export. In the realm of flowers, roses, cinerarias, calceolarias, camelias, azaleas, pelargoniums, and every flowering plant known to the temperate zone, exhibit a splendour of bloom unmatched in corresponding latitudes in the opposite hemisphere. Vegetables succeed as well as flowers. Yet, strange to say, Tasmania has been content that Chinamen should practically

monopolize the business of its market gardening. As regards pastoral pursuits, there has recently been a falling off in the number of sheep, and the value of wool exports remains nearly stationary at about £500,000 sterling. The timber industry occupies a considerable number of sawmills, but it is almost wholly supported by local consumption. When acquaintance with the finer timbers of the island is extended in England, a large market is sure to be found there for her blackwood, Huon pine, King William pine, red myrtle, oak, and musk. British experts have stated that some of these woods are worthy to be used as substitutes for the best Honduras mahogany.

It is not improbable that the most powerful impulse to increase of population in Tasmania will be given by her recent mining discoveries, especially gold, silver, tin, and coal. So recently as a quarter of a century ago mining of every description so little entered into the calculations of Tasmanians that it was passed over by the statistician without notice. Yet within that period no less than £2,300,000 in gold has been extracted from quartz and alluvial diggings in the island. Nevertheless, the reefs have not hitherto been worked to any great depth. Two nuggets have been found at Rocky River in alluvial deposits, weighing respectively 243 and 143 ozs. The Tasman gold mine alone has paid in dividends in 24 years upwards of £500,000. The localities in which the search for gold in Tasmania has been most successfully prosecuted are Beaconsfield, Lisle, and the west coast. The silver mines also give promise of yielding brilliant results. In the Mount Zeehan district argentiferous lead ore has been found at intervals over 30 square miles of country. The principal ore is galena, and the character of the less carefully selected portions of ore is indicated by the results of trial smeltings, which run as follows :—

	Tons.	Lead, lbs. per cwt.	Silver, ozs. per cwt.
Galena	193	50	64
,, ...	12	65	92
,, ...	15½	70	110
,, ...	9½	70	176
Carbonate	32	49	172
,, ...	26	37	216
Kaolin ore	22	12	201
,, ...	11½	17	432

The Mount Dundas field extends from the north-east side of Mount Zeehan northwards to the Pieman river. Various assays of ore from other sources have yielded at the rate of 100 to 800 ozs. of silver per ton of ore. In 1873 tin, for the

first time, appeared in the list of Tasmanian exports at the modest valuation of £220. In succeeding years it progressed by leaps and bounds until the output for 1888 reached £426,326, the total yield to 1890 being over £5,000,000. Prior to the opening up of the Mount Nicholas seams very small quantities of coal were raised in Tasmania, but four years ago that mining locality furnished the local supply for steam and domestic consumption, and later still, the mines began to export to Australia, the colliers' strike on the mainland giving Tasmania her opportunity. The heavy cost of land carriage to the nearest port operated seriously against coal as an article of export. But beds of coal extending over an area of some 40,000 acres are known to exist on the east coast within easy distance of a shipping place, and with a larger application of capital and labour to this enterprise, it may fairly be expected to expand indefinitely.

Although the waters around Tasmania teem with fish, the fishing industry is much neglected. There is a supply of animals and birds in the bush sufficient to satisfy the ambition of the keenest sportsman. Manufactures do not receive much encouragement in the colony. Victoria contains population enough to afford an excellent market for manufactured productions, but, unfortunately, the fiscal barriers erected in Melbourne against Tasmanian exports are, for the most part, impassable. The total railway mileage, when lines under construction are finished, will be about 470 miles. Nor does Tasmania lack provision for the mental and ethical development of her people. Her public libraries and efficient schools, public and private, and musical and art associations fully attest this. At the same time, her soil ought to attract farmers, her metalliferous and mineral resources, the miner, and her embryonic industries, the mechanic. And when we add to these inducements to immigrants her unrivalled climate and beautiful scenery, her prospects ought to be regarded as eminently encouraging.

NEW ZEALAND.

There is nothing in common between Australia and New Zealand so far as their flora and fauna are concerned. In the latter there is an entire absence, not only of marsupials, but of indigenous animals of any kind, with the exception of the native dog and rat and two species of the bat. The existence of snakes is unknown in New Zealand, but there are about 133 species of birds peculiar to the colony. Of these, 73 are land birds. The largest bird of which any trace can be found in the country is the moa, or dinornis, a gigantic wingless creature of the ostrich tribe. But it has long since disappeared, and only its bones are now to be found. It is

believed that 12 distinct varieties of the moa existed in a previous age, some attaining the enormous height of 12 feet. The eucalypt as a native tree is unknown, but the Kauri pine is the correspondingly representative tree of New Zealand. In all, there are about 120 indigenous forest trees which are evergreens, comprising a large quantity of valuable economic woods, and of these the principal one has just been named. With respect to the flora, it is stated that two-thirds of the prevailing species are confined to the New Zealand group of islands, and that 26 of the *genera* are found nowhere else. The fern tree grows in endless variety and almost endless profusion, and is represented by about 130 species, of which one-third are understood to be peculiar to the colony. Large tracts are covered with indigenous grasses of high feeding quality which support millions of sheep. The country is being largely enriched by the importation of useful and ornamental grasses and plants from Europe, America, and Australia, which flourish with a vigour scarcely reached in their own natural habitats. Not only does New Zealand widely differ geologically from Australia, but the formation of the north and south islands differ considerably from each other. The north island, with its two active volcanoes and boiling springs, is essentially volcanic, and that it continues to maintain that character may be inferred from the terrific eruption which took place in June, 1886. The formation of the south island is mainly sedimentary, the mountain slopes in the higher regions having extensive glacial deposits.

From the time of the discovery of New Zealand by Tasman in 1642, there is no record of any European having visited the group until 1769, when Captain Cook landed on the first of his great voyages. The illustrious navigator named the locality where he alighted from his pinnace Poverty Bay, and describes it in his diary as an "unfortunate and inhospitable place, as it did not afford a single article they wanted except a little firewood." Cook's aversion to the country was, doubtless, intensified by the collisions he encountered with the Maoris. Yet, contrary to what might be expected under the circumstances, he urged upon the British Government the colonization of New Zealand, and the eminent American statesman, Benjamin Franklin, had proposed an organization for the purpose. In was not, however, until 1837 that anything practical in that direction was attempted. In that year Lord Durham was able to organize the New Zealand Land Company, which proposed to the British Government that it should be invested with powers to colonize the country. In 1839 the preliminary expedition was undertaken in the survey ship *Tory*, under the command of Colonel William Wakefield, who was instructed to buy land from the natives, and select the site of the first settlement. He chose Port Nicholson, at the eastern entrance of Cook's Strait (now Wellington),

as the central depôt, and on the 22nd of January, 1840, the first batch of immigrants arrived. Auckland was the next settlement to be formed, the enterprise being under the direction of Captain Hobson. The New Zealand Company established New Plymouth and Nelson in 1841. Otago was founded in 1848 by a Scotch company, working in conjunction with the New Zealand Company. Through this joint organization, under the auspices of the Free Church of Scotland, a further detachment of settlers was attracted. Ten years later Canterbury was founded in a similar way on semi-religious lines, in connection with the Church of England. Hawke's Bay, originally part of the province of Wellington, separated and resolved itself into an independent province in 1858. Marlborough, previously an integral part of Nelson, broke off in the same manner and became a distinct province in 1860. Not the least formidable difficulties with which the pioneer colonists had to contend arose from a succession of little wars waged with the natives. Constitutional government was conferred on the colony in 1852-53, and the fact is too interesting to be passed over that the veteran statesman, Sir George Grey, who held the reins of government under the crown previous to responsible government being conceded, and under whose friendly guidance the Constitution Act was originally framed, still lives in the land he loves so well, and labours for her welfare, according to his lights, with an assiduity and singleness of purpose perhaps unexampled in colonial history.

The group of islands of which the colony consists is about 1,000 miles from Australia, to the south-east of that continent. The three principal islands extend about 1,200 miles in length and 104 miles in breadth, and contain 100,000 square miles, or 64,000,000 acres, being about five-sixths of the area of the United Kingdom. No point in the colony is more than 75 miles from the sea. The population is about 650,000, or one-sixtieth part of the population of the British Islands. Its coast line throughout is indented with the finest harbours, while 1,800 miles of railways and many thousands of miles of roads, as well as navigable rivers, afford access to local markets. In the north island there are lofty volcanic peaks, one of which, Ruapehu, is 9,100 feet high, in addition to several low ranges. In the south island are the Southern Alps, extending the whole length of the island near the west coast. Mount Cook, a peak of this range, is 12,349 feet high. Here the higher peaks are covered with perpetual snow, and magnificent glaciers are to be met with. But mountainous though the country be, there are extensive and fertile plains in the north island, mostly on the western side, and in the south island mostly on the eastern side. Streams and rivers abound everywhere. Over a large area snow never falls, and in parts liable to be visited by snow it rarely lies more

than two or three days during the year, except on some of the high lands in the interior, and never interferes with farming operations. The general mildness of the climate is proved by the fact that cattle live and thrive in the open air through the winter. It cannot be denied that, tested by the death rate, which is only 11 per 1,000, New Zealand is one of the most salubrious countries in the world. Not only is the death-rate the lowest in the Australasian colonies, but it is not above one-half that recorded in Great Britain. Besides, the excess of births over deaths, which in England is 57 per cent., is 197 per cent. in New Zealand. The climate ranges from that of the south of England to that of the south of Italy. Its coldest part is milder than can be experienced in any part of Ireland, and its warmest is the home of semi-tropical fruits. As a remedy for bronchial and pulmonary complaints, residence in the warmer section of the colony is highly recommended. There is only a difference of 20° between the hottest and the coldest months. The climate is more equable on the west coast on both the main islands than on the east, and there is more rain on the west side than on the east. The rainfall at Taranaki, on the west, is double that of Napier, on the east. The size of the trees and richness of vegetation generally in the forest country plainly show the soil to be exceedingly fertile, although there is the necessarily attendant drawback that it is difficult to clear. Still its productiveness is undoubtedly remarkable. The average yield per acre during a period of 12 years—1873-84—has been noted, with the following results: 26·28 bushels wheat, 27·28 bushels barley, and 32·32 bushels oats. For the same period New South Wales shows 14·93, 20·38, and 20·31 bushels respectively, the returns in all the other Australian colonies being much lower. Comparison between New Zealand and the vast cereal-producing provinces of Ontario and Manitoba is greatly in favour of New Zealand as regards wheat. All the productions of the British Isles flourish luxuriantly in New Zealand, and in a publication, authorized by the agent-general for the colony in London, occur the following words: "Manure is unnecessary for the rich virgin soils of New Zealand, and potatoes, unblighted, are floury as they were in Great Britain before the failure of 1847. There is not a wild beast or a venomous reptile in New Zealand, nor are the crops ever withered by drought as in Australia and South Africa, or devastated by locusts or grasshoppers."

The land is mainly used for raising sheep and cattle, wool being the staple product, although, as a rule, the sheep and cattle runs are not to be compared in size to those in Australia; but the land, acre for acre, is said to be much more productive to the wool grower. In 1890 there were 345,291 acres more land under crop—or broken up ready for cultivation—than in

1889, the total number actually under cultivation being 7,865,447. Of this total 6,525,049 were in grass, and about 46,000 in hay. The number of dairy farms in connection with arable tillage is large; but while the colony is chiefly devoted to pasturage, it is also increasing rapidly in agricultural importance. It produces more of each kind of grain than any other Australian colony. Moreover, there is now more land used for grain than at any previous period. The figures for 1890 are 826,505 acres, by far the highest on record. The value of the wool exported in the year ending 1892 was £4,313,000, and for the twelve months immediately succeeding £4,129,000. The annual value of frozen meat exported has advanced to more than £1,000,000. The grain exports may be set down at about £1,500,000. The hemp industry, although subject to occasional fluctuations, is, on the whole, prosperous. The exports of butter increase rapidly in quantity, and improve in quality. The coal-mining industry every year has a marked tendency to advance, and the supply of this mineral possessed by the colony is enormous. On the west coast bituminous coal exists in seams from ten to forty feet thick, and deposits amounting to 150,000,000 tons have been proved by actual survey. The present annual output exceeds 500,000 tons, and railways, combined with extensive harbour works, have been undertaken for the development of these coal measures. The colonists employed in manufactures number about 27,000. There are 2,280 different industrial establishments, in which a capital of £5,500,000 sterling is invested, the gross value of their production being upwards of £7,500,000.

A feature in the distribution of the population of New Zealand, which distinguishes it from the Australian colonies, is, that it contains no single large seaport which unwholesomely overshadows, by the number of its inhabitants, the other towns in a colony. Auckland, Dunedin, and Christchurch, approximate closely to each other in population, the largest not exceeding the smallest by more than 5,500. Wellington, the capital, stands fourth in point of numbers, with a population of 32,224 against Auckland, the most populous city, which has 51,287. The population of four other towns ranges from 5,900 to 8,900, and in a still larger number of towns, the population varies from 2,500 to 5,000; 1,800 miles of railway have been open at a cost of £15,000,000. The public debt contracted in the construction of the lines, as well as in the erection of 11,000 miles of telegraph wire and in the suppression of the Maori rebellion, can hardly fail to press somewhat heavily upon so limited a population. But the masses have ceased to be dazzled by the false glitter of borrowed money and the morbid speculation caused by it, and have settled down to honest hard work in developing the resources of the colony,

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and with economical Government administration and careful expenditure in private life, it is confidently believed that the liabilities with which the Government has for some time been burdened, will gradually be lightened.

It is not needful to dilate on New Zealand as one of the most charming resorts for the tourist. A writer intimately acquainted with the colony in this respect conveys his impressions in the following glowing terms: "As regards the scenery of New Zealand, I may make bold to say, after visiting many lands, and seeing many of the finest natural beauties the world has to show, that there is no country which possesses the wonderful variety of scenery which New Zealand can boast of. Switzerland may excel in more beautiful combinations of Alpine scenery and higher Alps; Italy in more dainty lakes; the Yellowstone Park may eclipse the Thermal Springs District for its Geysers, and Norway may grudgingly take the second place for its fiords. But when we consider the fine river and coast scenery in the North island round Hokianga, Russell, and Whangaroa; the wonders of the Hot Lake district round Rotarua and Taupo; the splendid gorge scenery of the coach rides from Nelson to Westport and Greymouth, and from Hokitika or Kumara to Springfield; the Haumer Hot Springs and the charms of Akaroa; the grand summits in the Southern Alps and the glaciers of Aorangi (Mount Cook); the wealth of beauty possessed by the various southern lakes; and lastly, the unique majesty and natural loveliness of the West Coast Sounds: I say when we consider that all these exist in a country about the size of England and Wales, it must be conceded that New Zealand is, indeed, 'that other Eden, demi-paradise.'"

FIJI.

The Fiji archipelago still lingers in the germinal stage of colonial life. These islands are situated between the parallels 15° and 22° south latitude, and the meridians of 177° west and 175° east longitude. They occupy the central portion of Western Polynesia, about midway between the Tongan Islands and the French colony and island of New Caledonia. Their total area is estimated at 4½ to 5 millions of statute acres, but only one-tenth part is owned by Europeans, whose total numbers do not much exceed 2,000, against 108,000 aborigines, 6,000 Indian immigrant labourers, 3,000 Polynesian immigrant labourers, and 800 half castes. Following the rule invariably applicable to the decay of native races in Polynesia, when these are brought permanently in contact with colonists of European descent, the tendency of the native population in Fiji is to decrease. Statistics show that the yearly number of deaths among the native population is about 4,920, against only

3,990 births, while the deaths among Europeans numbered 45, as compared with 77 births. The islands have long suffered from commercial depression, and it is hoped that, under the governorship of Sir J. B. Thurston, who has a more intimate knowledge of the country and the people than any previous governor, a marked revival of prosperity may occur. The total trade of the colony is under £500,000 sterling, and is at present principally carried on with New South Wales, Victoria, and New Zealand, the exports being considerably in excess of the imports. The amount of capital invested in Fiji is upwards of £3,000,000, a large portion being devoted to the cultivation of sugar cane and the manufacture of sugar. Of the numerous islands which constitute the group, the two largest by far are Viti Levu (big Fiji) and Vanua Levu (big land). The soil of the former, which is about 90 miles long and 50 miles wide, is not equal to that of the latter for producing cocoa nuts, but Viti Levu, notwithstanding, continues to thrive, mainly owing to the conveniences offered to shipping by Suva harbour. It is the seat of the sugar industry, and the scenery of the island is enriched by vast clusters of mangrove bushes and other tropical shrubs. The largest of its rivers is Rewa. Vanua Levu is about 95 miles long, and averages 25 miles in width. In common with the larger island is contains abundance of sandal wood, but mostly on the western side. It contains five hot springs about 9 feet above water level, a short distance inland. The main spring is so hot that it cooks yams and taro placed in it by the natives in 20 minutes. Suva was chosen in 1880 to be the capital, and, with its suburbs, contains 690 to 700 whites. Its harbour is free from shoals, with good holding ground, and easy of ingress and egress. It is supplied with water from a reservoir in the mountains five miles distant. The principal thoroughfare is Victoria Parade, which is nearly a mile long and sufficiently broad. It possesses several churches, and many stores, warehouses, and cottages. It also has a hospital, lunatic asylum, jail, Government buildings, mechanics' library, and public school. Levuka, on the east coast of Ovalan, was the former capital, and covers an area of about 40 acres. It is surrounded by hills which, unless terraced, would bar its expansion in the distant future into a great city. Although dethroned from its position of honour as the seat of government, it does not decline in importance. It, too, contains churches, a hospital, and a mechanics' institute. But, on the other hand, it outstrips the present capital in having a fire brigade, a skating rink, a public clock, and bathing places. Heat is not felt to be so intense as might have been anticipated when the proximity of Fiji to the equator is considered. This is accounted for by the tempering influence of the sea breezes. The mean temperature of the islands is about 80°, the lowest reading of the thermometer being 60°, and the highest 122° in the sun. The

hurricane season is from Christmas to March. The dry season, which is also cool, lasts from May to October; the wet season is hot, and lasts from October to May. For nine months the climate is very agreeable and healthy, but during the hot season dysentery prevails.

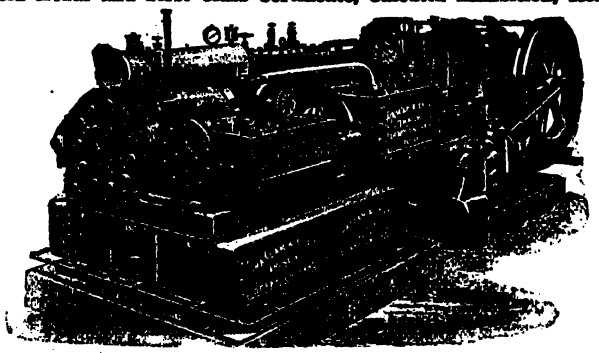
Fiji is now fully recognized as related to the Australasian colonies, and may some day be federated with them. Indeed, a few years ago a majority of the European settlers memorialized Victoria to annex it. But as it is a crown colony and so distant from Melbourne, irrespective altogether of the addition to the public expenditure of the larger colony which would be entailed, the proposal was not seriously entertained by the Victorian Government. But Fiji was invited to send a representative to the Federation Conference held a few years ago at Sydney, and in commerce and defence its relations must become closer every year with Australasia. The country is devoid of indigenous animals excepting flying foxes and a small rat, but of lizards there are at least 100 varieties. The chief articles of export are bêche-de-mer, coffee, copra (including cocoa nuts), cotton, fibre, green fruit (chiefly bananas), hides, maize, molasses, peanuts, pearlshell, sugar, and wool. A drawback to remunerative business with Australasia, especially in green fruit, hitherto, has been the want of a subsidized line of steamers to run regularly and more frequently than at present between Fiji and the Australasian ports. In the absence of this required shipping accommodation large quantities of tropical fruit often perish while awaiting opportunities of shipment. But the development of the fertile and varied resources of the colony can only be a question of time, as, sooner or later, the attention of capitalists will be practically directed to the vast latent wealth locked up in the soil, which only requires money and enterprise for its realization.

THE END.

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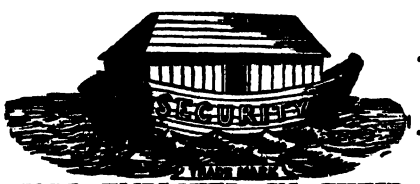
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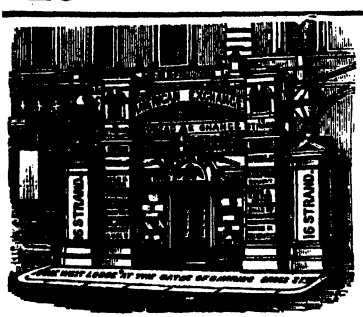
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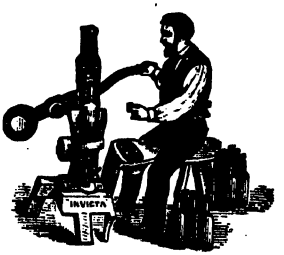
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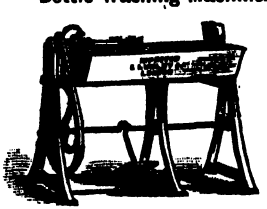
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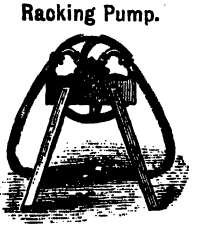
The "Lightning" Bottle Washing Machine.



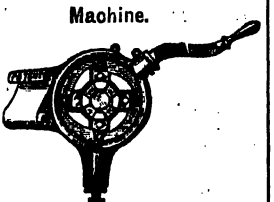
The "Improved" Bottle Washing Machine.



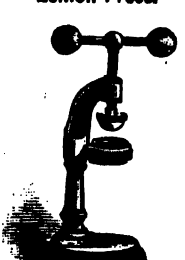
Rotary Racking Pump.



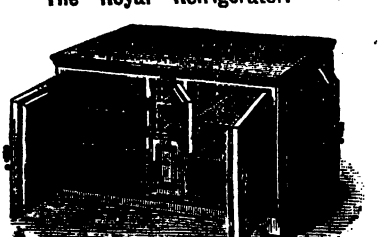
New Patent Capsuling Machine.



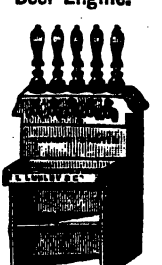
New Improved Lemon Press.



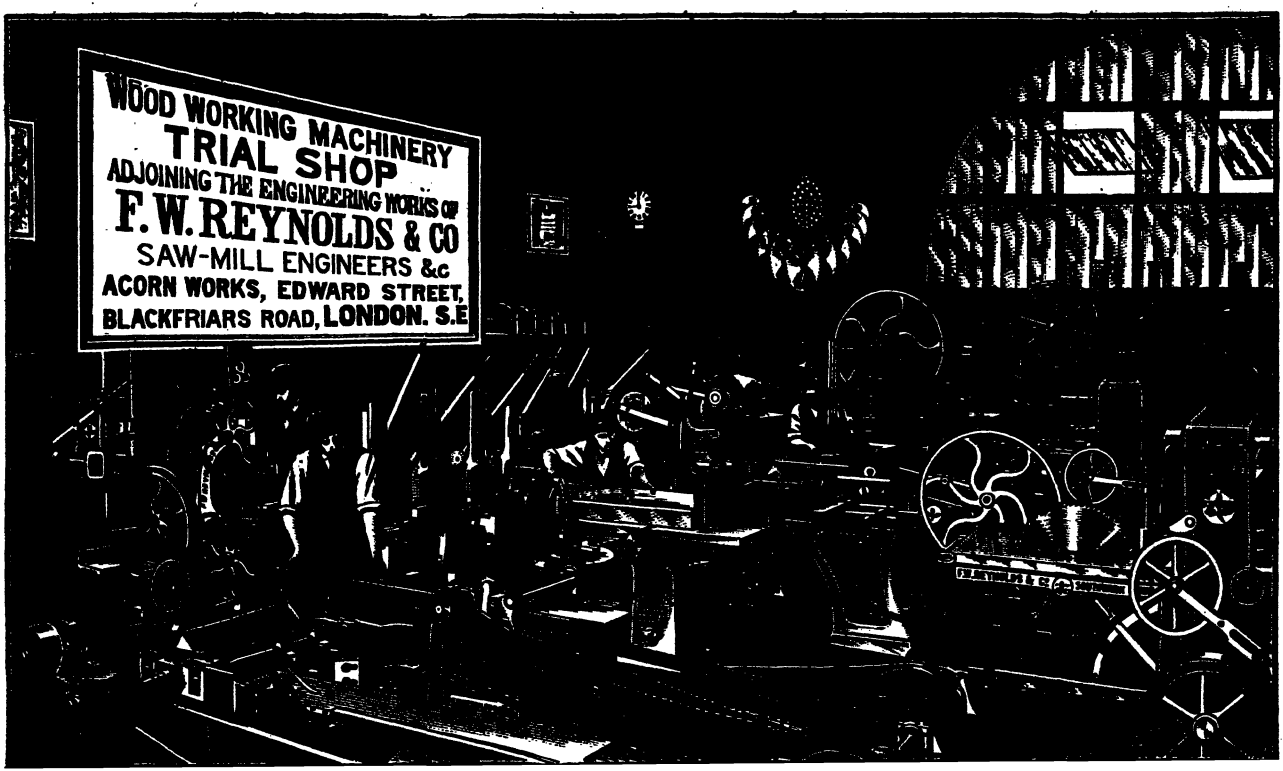
The "Royal" Refrigerator.



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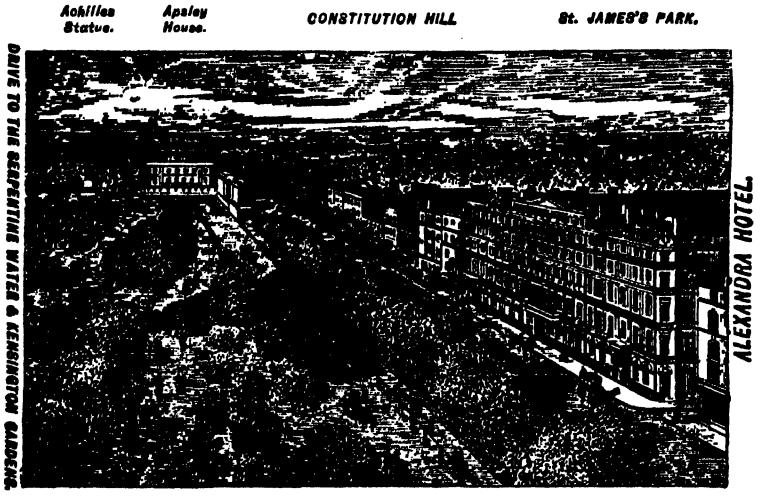
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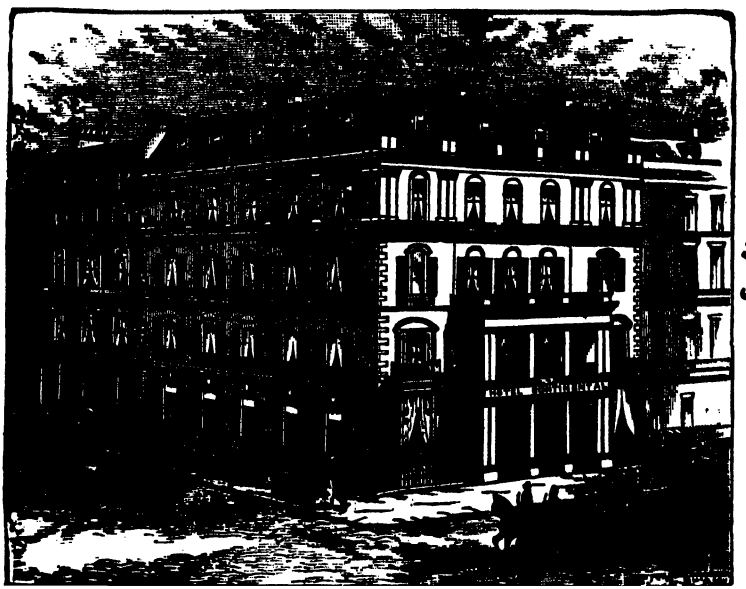
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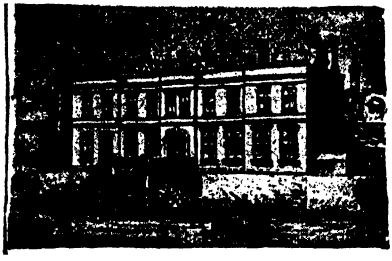
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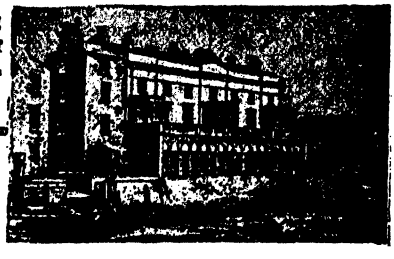
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THE SANITATION IS PERFECT.

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The Charges are exceptionally Low. A Tariff will be forwarded immediately on application to the Proprietors—

Telephone No. 140. **Telegraph—"ARMFIELDS," LONDON.**

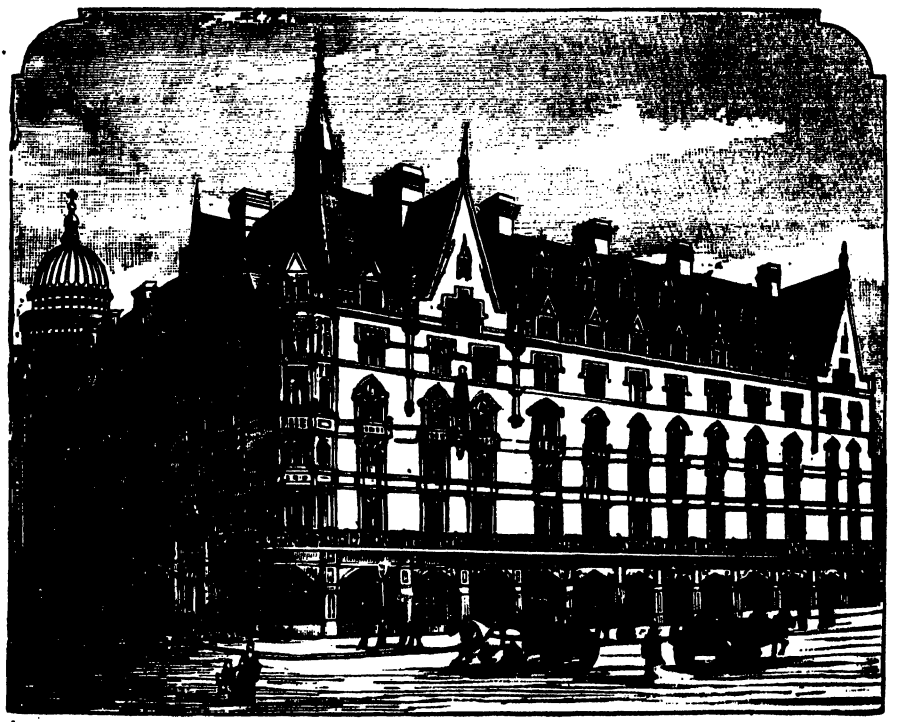
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CENTRAL FOR EVERYWHERE.



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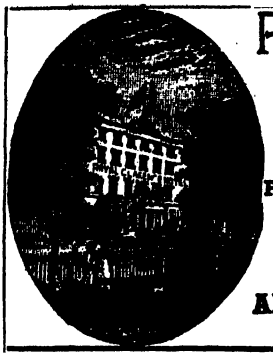
The Hotel contains 800 Bedrooms, Coffee Room, Ladies' Coffee Room, Billiard Room (seven tables), Drawing, Sitting, Arbitration, and numerous well-lighted Sample Rooms.

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Also HALF MOON FAMILY & COMMERCIAL HOTEL.

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JOHN SYMONS & CO., Limited,

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CHAMPAGNE DEVONSHIRE CIDER.

ROYAL EXCELSIOR WINES.

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IMPERIAL CIDER IS THE BEST IN THE MARKET.

BOTTLING AND DRAUGHT CIDERS.

All made on the most Scientific Principle, resulting in a WHOLESOME INVIGORATING DRINK.

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ELECTRIC LIGHT.

Night Porter.

BOURNEMOUTH

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The finest climate in England.

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EN PENSION

TELEGRAPHIC ADDRESS:
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KNOWN ALL OVER THE WORLD. ESTABLISHED 54 YEARS.
PATRONISED BY THE BEST FAMILIES.

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The Electric Light in every room (including Bedrooms). The Sanitary arrangements are absolutely perfect. Excellent Cuisine under the care of an experienced Chef. Fine Coffee Room. Luxurious Reception, Reading, and Smoking Rooms.

TABLE D'HOTE (Separate Tables), from 6 to 8 p.m.

PASSENGER LIFT. MODERATE CHARGES.

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St. Dunstan's House, Fetter Lane, Fleet Street, E.C.

NEW ZEALAND.

1. DESCRIPTION.—This Colony consists of a group of Islands, of which the two principal are called the North and South Islands, and a third, much smaller, called Stewart's Island. The whole group is over 1,000 miles long, with an average breadth of 140 miles. The Coast-line extends over 3,000 miles. There are, besides, some small outlying islands within the limits of the Colony, such as the Chatham Islands, the Auckland Islands, and Bounty Island. The nearest European parallel to the climate is that of Italy.

2. LAND.—Persons desirous of obtaining information as to the Crown Lands of the Colony now open (or shortly to be opened) for sale or lease, can obtain full particulars on application at the General Crown Lands Office, Wellington, or at the Crown Lands Offices at Auckland, New Plymouth, Wellington, Napier, Nelson, Blenheim, Christchurch, Dunedin, Invercargill, and Hokitika, where Plans and Maps can be inspected and obtained. The "Crown Lands Guide" contains full particulars as to the quantity and quality of land open for sale or leasing in different parts of the Colony, and can be obtained at all the Land Offices in the Colony. Improved farms may also be bought from private owners, some of whom acquired large tracts of land at low prices in former times.

3. PRODUCTS.—According to the latest statistics, there were 187,000 horses, 853,000 cattle, and 19,880,369 sheep in the Colony, and the annual value of wool exported amounts to about three-and-a-half millions sterling. In 1892-3 96,736,000 pounds of frozen meat were exported to London, and there is a large and growing export of dairy produce and fruit. The Colony also produces wheat, oats, barley, flax, hemp, hay, linseed, potatoes, tobacco, kauri gum, and all descriptions of fruit and root crops grown in England. The bays and seas surrounding teem with fish, a hundred and forty species of which are known, of which thirty-three have been found of great value as articles of food. The rivers are well stocked with English and American trout.

Extensive coal beds have been found in almost every district, varying from ten to forty feet in thickness. The gold-fields have already produced above forty-five million pounds' sterling worth for export. Iron mines have not yet been worked, but many varieties of iron ore, and in many cases of the purest character, are found in large quantities in many districts of the Colony, a large extent of sea coast being covered with almost pure iron sand.

All English trees grow well in New Zealand, and the forest trees indigenous to the country are of the finest kind and of great commercial value.

4. EDUCATION.—The State system of elementary education is secular, and free of all cost to pupils. There are 1,200 district schools, with 117,400 pupils, and 2,978 teachers. There are endowed colleges and grammar schools for the higher education of boys and of girls in all the cities and large towns. The University of New Zealand has power to confer degrees.

5. RAILWAYS.—Tourists' Excursion Tickets may be obtained on application at the Booking Offices at Auckland, Wellington, Lyttleton, Christchurch, Port Chalmers, Dunedin, Invercargill, and Bluff Railway Stations. There are 1,870 miles of railway open to the public.

Tourists would do well to visit the Sounds of the West Coast of Otago, also the chain of Lakes that stretches North-east from Lake Manapouri in Otago, to Lake Tekapo in Canterbury, then visit the glaciers of Mount Cook, and cross by the Otira Gorge from Canterbury to Westland. The boiling springs, geysers, and terraces of the Auckland Hot Lake district, will also well repay a visit. Tourists' Maps and information generally with regard to the Colony can be obtained at the New Zealand Government Office, 13, Victoria Street, London.

NELSON BROTHERS LIMITED,

IMPORTERS OF

New Zealand & Australian Mutton & Beef.

LONDON.

HEAD OFFICE:—15, Dowgate Hill, E.C.
MARKET OFFICE:—6, West Smithfield, E.C.
REFRIGERATED STORES:—Nelson's Wharf, Lambeth, and 84, Upper Thames Street, E.C.

PROVINCIAL OFFICES & STORES.

BIRMINGHAM:—Lease Lane, and St. Martin's Market.
CARDIFF:—Tressilian Terrace.
LEEDS:—Lawns Lane, Hunslet.
LIVERPOOL:—15a, Richmond Street, and the Abattoirs.
MANCHESTER:—The Abattoirs.
NEWCASTLE-ON-TYNE:—Baltic Chambers, Quayside.

STATISTICS.

The following figures of Importations of Frozen Mutton and Lamb during 1891 indicate the progress that has been made in the Trade, from which it will be seen that the arrivals have been:—

From New Zealand, **1,906,002** carcases, against **1,532,833** in 1890, and **1,080,564** carcases in 1889.
„ Australia, **335,192** „ „ **208,295** „ „ **95,920** „ „

We therefore have the following results:—

New Zealand shows an increase in 1890 over 1889 of **452,269** carcases.
„ „ „ „ „ 1891 „ 1890 „ **373,169** „
Australia „ „ „ 1890 „ 1889 „ **112,375** „
„ „ „ „ 1891 „ 1890 „ **126,896** „

The arrivals of Frozen Beef have been as follows:—

From New Zealand, **73,779** pieces, against **55,536** in 1890, and **43,519** in 1889.
„ Australia, **29,097** „ „ **15,317** „ „ **14,201** „

LONDON TESTIMONY IN FAVOUR OF FROZEN MUTTON.

Lord Onslow, though about to retire from the Governorship of New Zealand, has evidenced his practical interest in the material welfare of the colony to the last. With a view of having a proper comparison instituted between English mutton and the New Zealand frozen article, he some time ago forwarded six selected carcases of Canterbury sheep to Baron H. de Worms, M.P., the Earl of Rosebery, Sir Augustus Harris, sheriff of London, Sir Morell Mackenzie, M.D., M. Waddington, the French Ambassador in London, and General Sir Henry de Bathe, one of the committee of the Beefsteak Club, whose members have a house dinner once a week, at which one member of the committee has to dine, to select the principal dish, and to be responsible for its excellence. In his letter of advice Lord Onslow intimated that the sheep were not sent as a present, for which thanks were expected, but that he might ascertain whether the freezing process in any way caused deterioration in mutton which he had himself found equal to that which careful breeding and considerable expense had enabled him to produce from his own flock of pedigree Southdowns. The result is six excellent testimonials as to the excellence of New Zealand mutton. For instance, Sir H. de Bathe, of the Beefsteak Club, wrote:—"Last Friday we had a large assemblage at the B.S.C. to eat your mutton. The consensus of opinion was that it was most excellent. Dick Grain, Frank Burnand, Bancroft, G. A. Sala, Alf. Watson, and some dozen others also agree. I, who am a dweller on the South Downs, can safely aver that your individual sheep was better than what I can buy in Chichester, where it always wants age and colour. It was as tender as a chicken. Could the club make arrangements for a regular supply of mutton of the same quality; and if so, should we have to pay more than our London butchers' prices?"—*The Daily Chronicle, 6th January*, 1892.

GREAT WESTERN RAILWAY.

Information for Passengers landing at Plymouth.

STEAM TENDERS meet the vessels belonging to the principal Steamship Companies on arrival at Plymouth, and convey passengers and their baggage to the Great Western Docks, situated about 600 yards from the Great Western Railway Station, and contiguous to the Telegraph office and the principal hotels.

Whenever the vessels disembark their passengers (and a sufficient number of passengers land), railway carriages and luggage vans will be placed opposite the Custom House at the Docks, so that passengers for the Great Western Line may, after their baggage is cleared, take their seats and proceed without change of carriage, *via* Millbay Station, to London, or any other station *en route* at which the Train stops.

The Tickets from Plymouth to London are available for seven days from the date of issue, and passengers travelling to London by Great Western Railway may break their journey at any Main Line Station *en route*, provided the journey is completed within that time. Application for the necessary authority to break the journey must be made to the Ticket Clerk at the Docks, or to the Station Master at the Millbay Station.

Reduced Fare Tickets to Exeter, Taunton, Bristol, Bath, Swindon, Didcot, Reading, Salisbury, and London, can be obtained by Passengers landing from Ocean Steamers at Plymouth, on presentation of a voucher signed by the Local Agent of the Steamship Company.

Special Trains will be run whenever there is a sufficient number of passengers, and will be timed to start from the Millbay Station as soon as practicable after the arrival of the vessels. The Company's servants at the Docks and Railway Station will afford passengers every information they may require as to the departure of the Trains and the railway arrangements generally.

TRAIN SERVICE between LONDON and PLYMOUTH (Week Days).

		a.m.	a.m.		a.m.	p.m.	p.m.	p.m.	A p.m.
Paddington ...	*Dep.*	5 30	10 15		11 45	1 15	3 0	5 0	9 0
		p.m.	p.m.		p.m.				a.m.
Exeter	*Arr.*	11 3	2 20		4 5	5 39	7 20	10 35	2 30
		p.m.							
Plymouth ...	*Arr.*	12 53	*3 45		5 54	7 35	9 2	12 25	4 35
		a.m.	a.m.	a.m.		p.m.	p.m.	p.m.	A p.m.
Plymouth ...	*Dep.*	8 45	10 35	10 45	12 0	*2 15	3 22	3 58	8 10
			p.m.	p.m.	p.m.				
Exeter	*Dep.*	10 35	12 12	12 45	1 55	3 40	4 5	5 43	10 30
		p.m.							a.m.
Paddington ...	*Arr.*	2 53	4 30	6 0	6 30	7 45	8 25	10 3	4 0

* North Road.

ORDINARY FARES ARE CHARGED BY ALL TRAINS.

A—A Sleeping Carriage (1st class) works between LONDON and PLYMOUTH by these Trains.

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PADDINGTON, *June*, 1894.

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COLOGNE—M. J. J. NIESSEN, 5-6, Domhof.

CALAIS—Capt. BLOMEFIELD, Gare Maritime.

MONTE-CARLO—Messrs. SMITH & CO., Bankers.

BALE—Messrs. De SPEYER & CO., 56, FREIE STRASSE.

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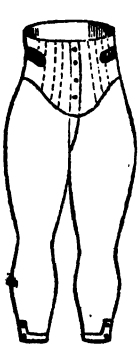
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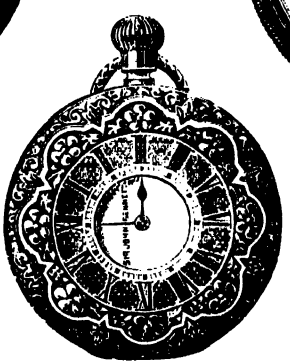
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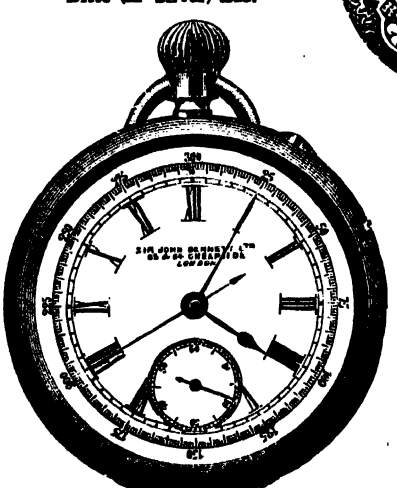


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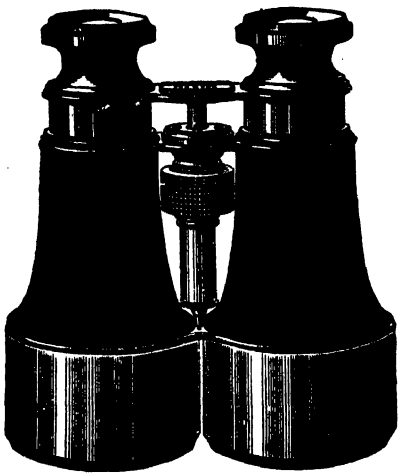


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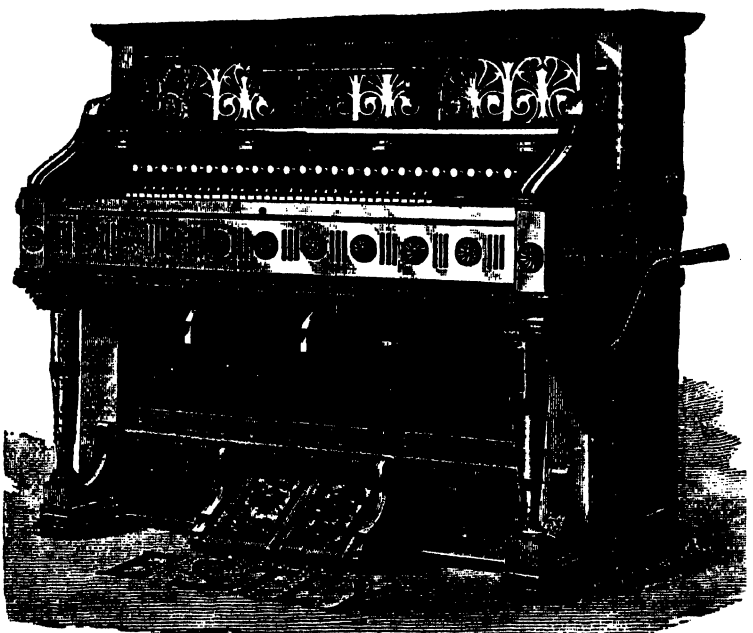
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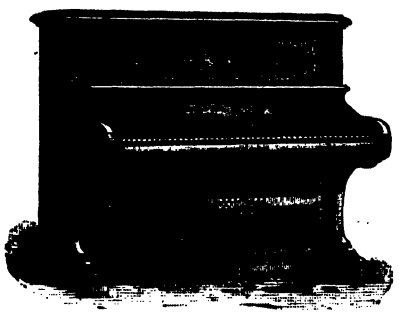
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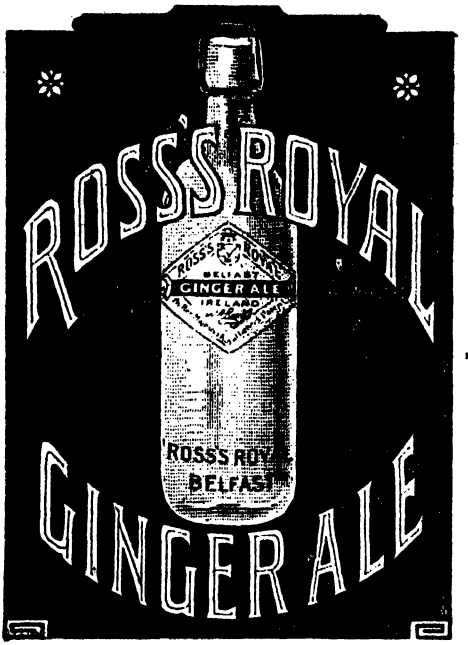
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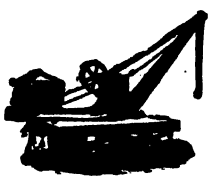
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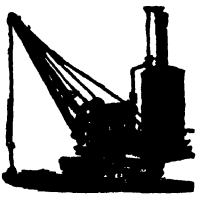
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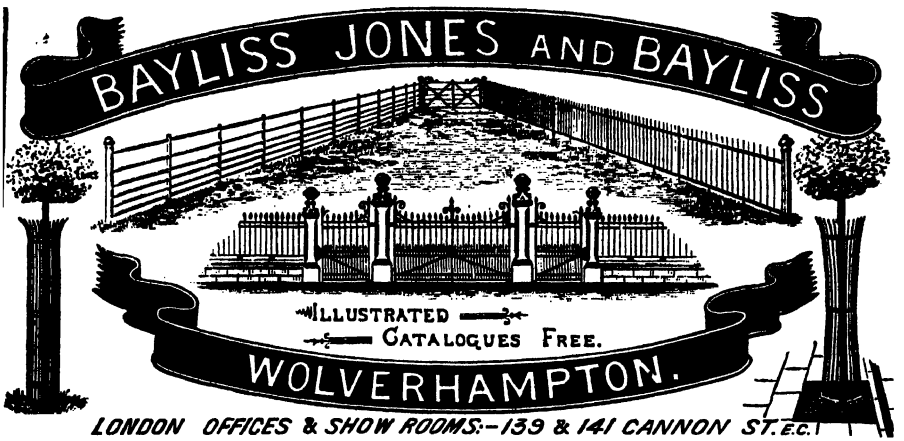
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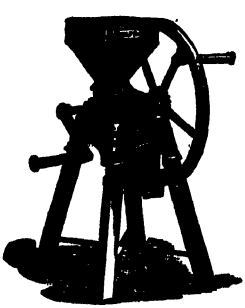
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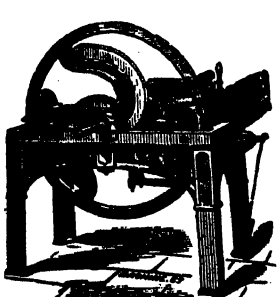


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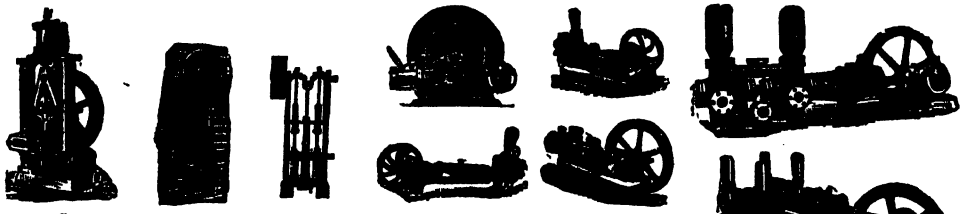
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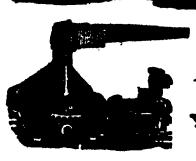


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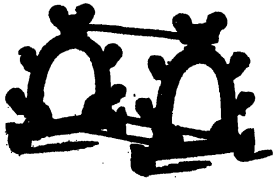
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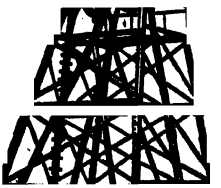
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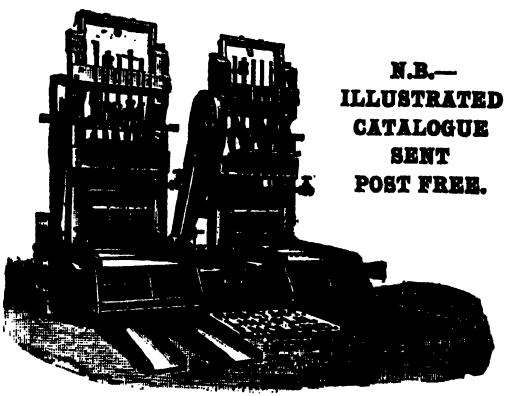
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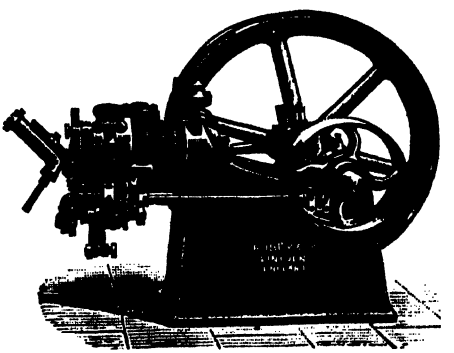


Steel Head Gear.

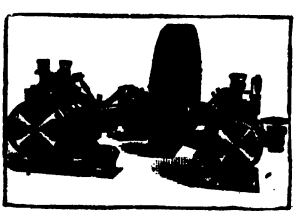


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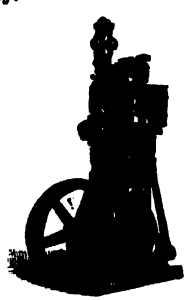
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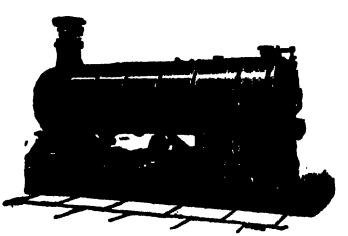
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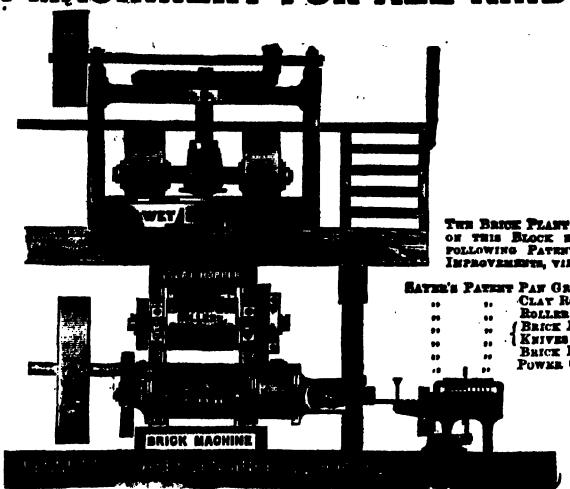


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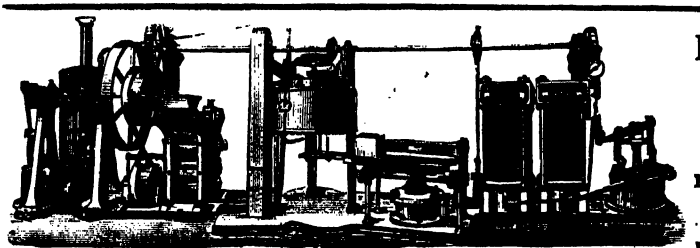


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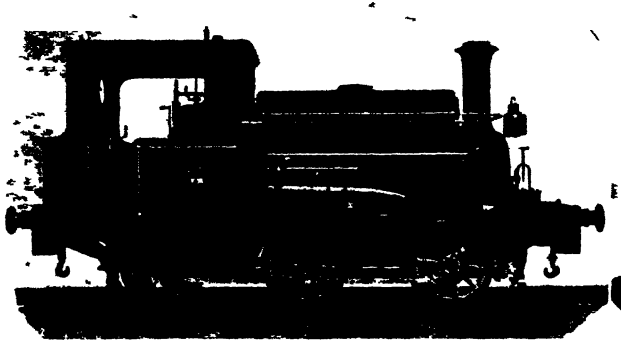
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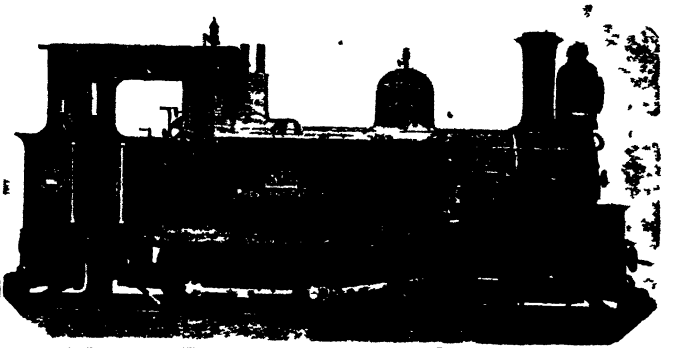
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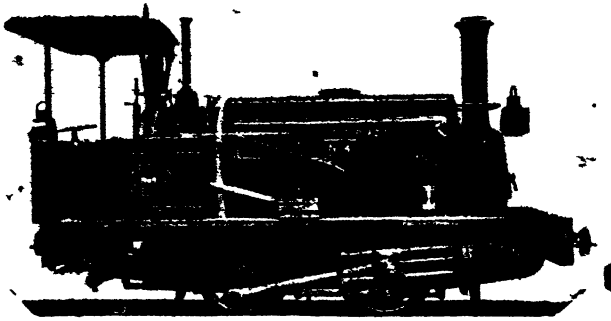
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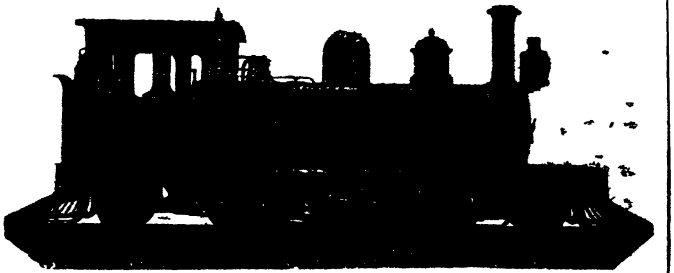




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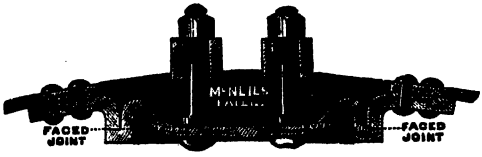
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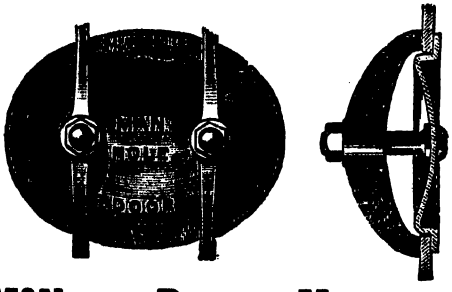
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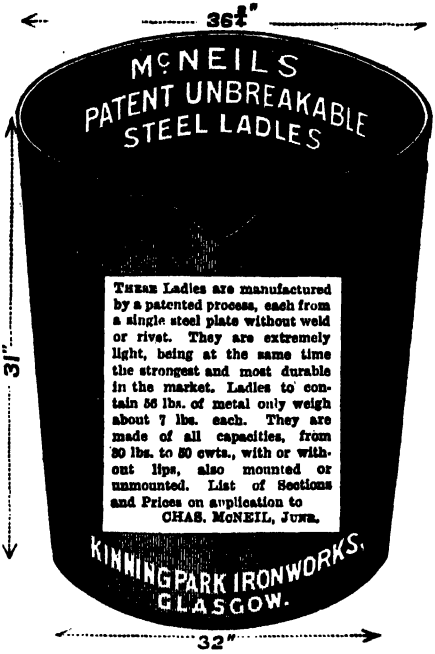
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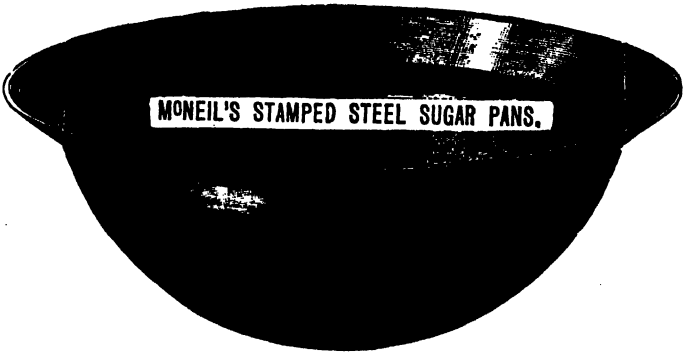
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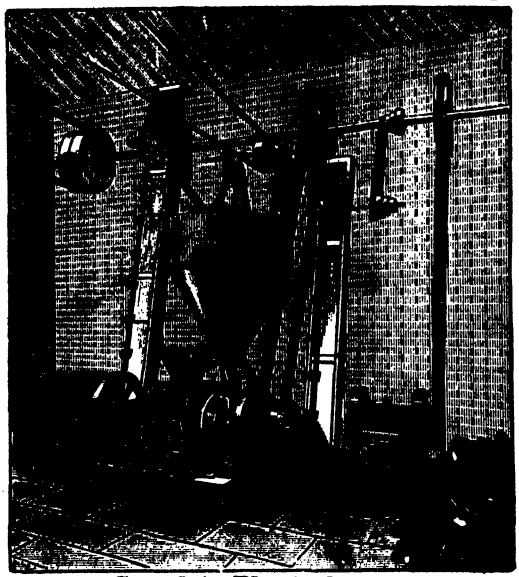
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Stamped G and other Marks.

Every Description of Wrought Nails.

West India, Cape, Australian, &c., Horse Shoes, and Patent Mule and Horse Shoes.

BEST COUNTER CLOUT NAILS, RIVETS, AND CHAINS, FOR EVERY MARKET.

GUEST & Co. purchased the Stock, Trade, Trade Marks, and Trade Name of BADGER & Co., formerly THOMAS & ISAAC BADGER, Dudley.

ALL SPORTSMEN

SHOULD USE

JOYCE'S AMMUNITION.

UNSURPASSED FOR QUALITY.

Solid drawn Metal Cartridges, for Martini-Henry, Winchester, and other Rifles, Webley, Colt, and Smith and Wesson Revolvers.

Sporting Cartridges, loaded with Best T.S. Black Powder, E.C. Schultze, and Smokeless 8.8.

GUN WADDINGS, PERCUSSION CAPS, AND SHOT (SOFT, HARD CHILLED, AND MOULD).

To be had of all Merchants and Dealers.

F. JOYCE & Co., Ltd., 57, Upper Thames St., London, E.C.

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(HENNIKER & HOGGE,)

34, LEADENHALL STREET, LONDON, E.C.,

Shipping, Forwarding, Custom House, and Insurance Agent.

GOODS, LIVE STOCK, PARCELS, &c., SHIPPED TO ALL PARTS OF THE WORLD.

CATTLE INSURANCES EFFECTED

against all Sea Risks, including Mortality, at the very lowest possible rates; risk covering transit from farms in England until safe delivery on farms abroad.

AGENT FOR COMPRESSED FODDER

specially prepared for Cattle and packed in small bales for Export.

PASSAGES TAKEN OUTWARD AND HOMEWARD. BAGGAGE RECEIVED & DESPATCHED.

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PEDIGREE CATTLE AND SHEEP BOUGHT FOR CLIENTS.

Foreign Orders for General Merchandise executed at moderate Commissions.

The Royal

FIRST - CLASS FAMILY HOTEL,

PLYMOUTH.

HANDSOME GENERAL COFFEE ROOM. WRITING AND SMOKING ROOM.

LADIES' DRAWING ROOM.

The situation of this Hotel is most convenient for business or pleasure.

SUPERIOR STABLES AND LOCK-UP COACH HOUSES.

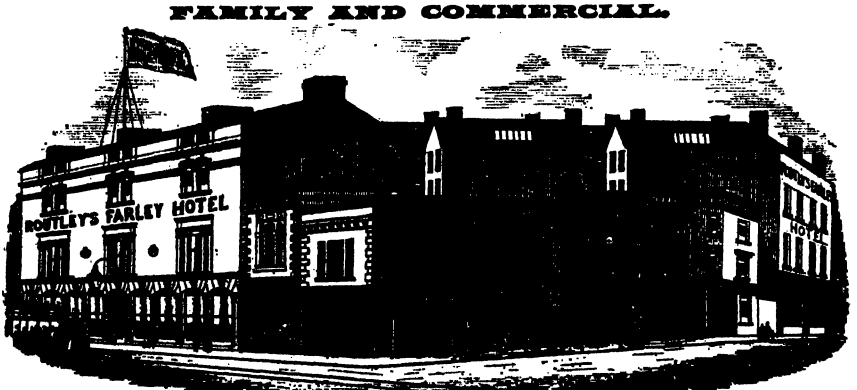
Every variety of Carriages for Posting and Excursions.

Omnibuses meet all Trains, Great Western and South Western.

CARRIAGES IF ORDERED. S. PEARSE, Proprietor.

FARLEY HOTEL, PLYMOUTH.

FAMILY AND COMMERCIAL.



Good Coffee Room and Sitting Rooms.

THREE MINUTES' WALK FROM GREAT WESTERN STATION AND DOCKS.

CENTRAL FOR THE THREE TOWNS. BUS MEETS ALL TRAINS. NIGHT PORTER.

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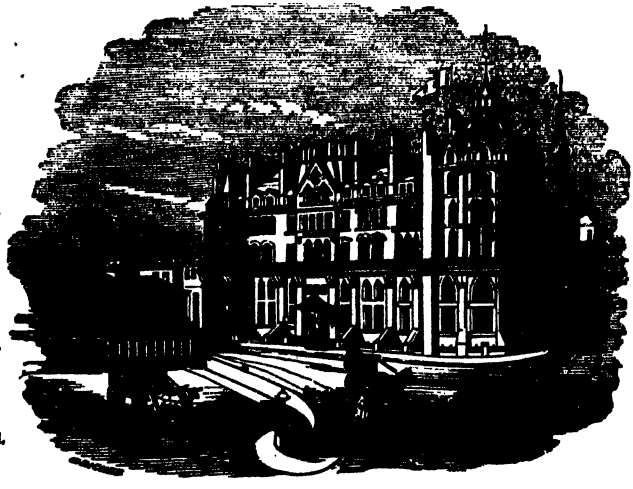
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(OPPOSITE THE RAILWAY TERMINUS.)

ORIENT STEAM SHIP COMPANY'S OFFICES.

SPACIOUS COFFEE ROOM.

LADIES' DRAWING ROOM.



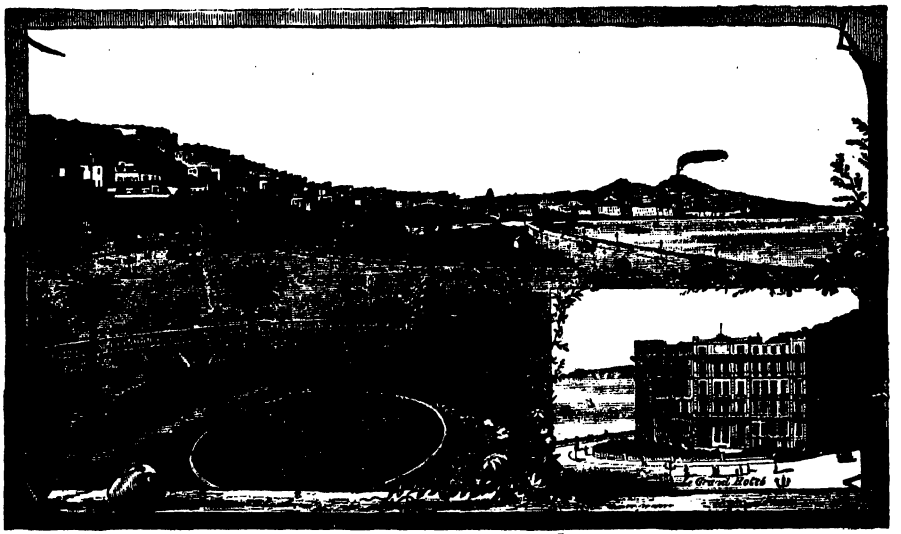
HOT and COLD BATHS.

BILLIARD and SMOKING ROOMS

TABLE D'HOTE DAILY.

N.B.—This Hotel is the most commodious and convenient in Plymouth. It is distant only five minutes' walk from the SEA, the Great Western Docks, and from the business centre of the TOWN.

GRAND HOTEL



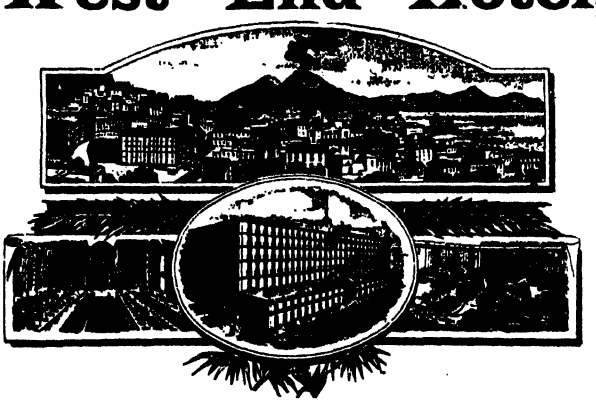
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NAPLES. NAPOLI.

First-class and most comfortable Hotel, situated in the finest and most select part of Naples, with magnificent views of the Town, Vesuvius, and the Bay. Hydraulic Lift.

ALFRED HAUSER, Proprietor.

West End Hotel, Naples.



(Late Grand Hotel Nobile),

ON THE

New Rione Principe Amedeo.

FIRST-CLASS HOTEL, entirely renovated. Healthy elevated position, with fine view of Vesuvius and the Bay. Lift.

HAUSER & MULLER,

Proprietors.

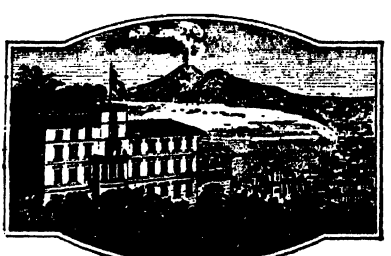
HOTEL BRISTOL, NAPLES.



Kept by A. LANDRY, Proprietor.

Situated in the highest and healthiest part of the City. Excellent sanitary arrangements.
Every comfort. First-class cuisine. Polite and ready attendance. Elevator.
Prices moderate. Pension.

HOTEL QUISISANA,



CASTELLAMARE

NEAR

POMPEII.

Centre of EXCURSIONS for

VESUVIUS, POMPEII, SORRENTO, CAPRI, CAVA, AMALFI, PÆSTUM, &c.

TELEGRAPH OFFICE IN THE HOTEL.

DOMBRÈ & CANNAVALE,

Proprietors.

ISOTTA BROTHERS, NAPLES.

HOTEL GENEVE (Piazza Medina).

In the centre of the town, in proximity to the Port, General Post Office, and Telegraph, the principal Banks and Theatres. Telephone and Hydraulic Lift. Good attendance and moderate prices.

HOTEL CENTRAL (Piazza Medina).

Close by the Hotel de Geneve. Highly recommended for business men.

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PARKER'S HOTEL (late TRAMONTANO).

AN ENGLISH HOTEL UNDER ENGLISH MANAGEMENT.

On the high CORSO VITTORIO EMANUELE, the healthiest part of the Town.

THE MOST LOVELY VIEW OVER

VESUVIUS, CAPRI, AND THE WHOLE BAY.

Passed by the Trams; close to the Stations of the Vomero Funicular and the Cumæan Railways.

SANITARY SYSTEM PERFECT, with the latest English appliances.

ALL ORIENT LINE STEAMERS MET.

ELECTRIC LIGHT IN ALL ROOMS. LIFT.

57, VIA SISTINA.

COMFORTABLE FAMILY HOME.

Kept by Mrs. DAWES, formerly of Hôtel Grande Bretagne, Pozzuoli, near Naples.

Successor to the late Miss SKED.

Healthy and central position, being on the Pincian Hill, and near to the Piazza di Spagna. Terms from 8 to 12 francs per day, wine included.

Hotel Royal, Naples,

CAPRANI,

SITUATED ON THE NEW EMBANKMENT, FULL SOUTH.

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First Modern Hotel established here (1876).

OPEN ALL THE YEAR ROUND.

Attendance, etc., specially adapted to the requirements of Overland Travellers to and from the far East. Manager and Servants speaking the principal languages.

This House is patronised by the élite of society for health, scenery, comfort and elegance.

English Sanitary Appliances, Bath Rooms, etc.

Telegraphic Address—"CAPRANI, NAPLES."

The Old Maltese Bazaar,

By CHARLES YELLA,

PORT SAID, MAIN STREET,

Three Minutes' walk from the Landing Place on the Left Hand Side.

Established A.D. 1871.

MALTA LACE MERCHANT.

Jewellery and Turkish Goods.

All SORTS of TOBACCO, CIGARS & CAIRO CIGARETTES.

Attends regularly on Board all Passenger Steamers.

ORDERS PROMPTLY EXECUTED.

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HOTEL DU NIL.

THIS favourite first-class Hotel is situated in the centre of all curiosities of the City, with full aspect of the south. It has been lately enlarged by several new apartments, replete with every modern comfort.

Bath, Music, and Reading Rooms, with English, German, French, and American Newspapers.

Omnibus and Dragoman at the arrival of each train.

H. FRIEDMANN,
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HÔTEL CONTINENTAL,

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This first-class Hotel, newly built and most comfortably and handsomely furnished, is situated in the finest and healthiest part of the Ismailieh quarter, near the English and Catholic Churches.

PERFECT ENGLISH SANITARY ARRANGEMENTS.

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DRAWING ROOM AND LADIES' SALOONS.

READING, SMOKING, AND BILLIARD ROOMS.

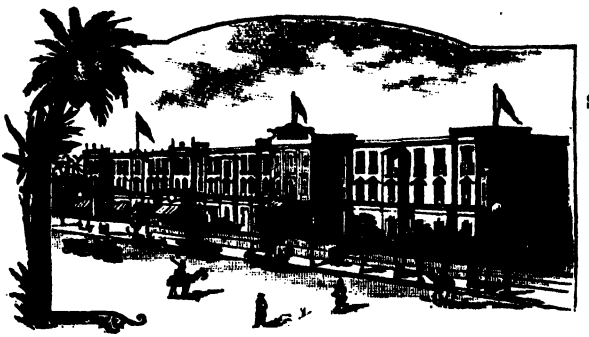
BEST CUISINE. MODERATE TERMS. HYDRAULIC LIFT.

GEORGE NUNGOVICH, Proprietor,
Same Proprietor of the HOTEL D'ANGLETERRE.

A. AULICH, *Manager.*

Shepheard's Hotel, Cairo.

Patronised by Imperial and Royal Families.



This world-famed Establishment, situated in the most healthy and interesting part of the city, combines the comforts of home with the luxury of the finest Hotels in Europe.

THE SURROUNDING GARDENS AND PALM-GROVES ARE THE PROPERTY OF THE HOTEL.

ROOMS & SUITES OF APARTMENTS FACING FULL SOUTH. PRIVATE STREET ENTRANCES. FIRE-PLACES.

HAIR-DRESSING SALOON. TENNIS COURT.

Drainage and Sanitary Arrangements on the most modern principles, fitted up by eminent English Engineers, and approved by the Sanitary Engineer to the Egyptian Government.

A Thick Layer of Hydraulic Concrete preventing humidity and noxious emanations.

FIREPROOF STAIRCASES. Electric Light throughout the Building. HYDRAULIC LIFTS.

SPECIAL DISINFECTION HOUSE ON THE MOST MODERN PRINCIPLES.

Branch Offices of the Egyptian Post and Telegraph, and the Eastern Telegraph Co., Ltd.

FOR TERMS AND PARTICULARS APPLY TO THE MANAGER. **PH. ZECH**, *Proprietor.*

(ÉGYPTE) **LE CAIRE** (ÉGYPTE)

GRAND NEW-HOTEL.

P. MAYER, Directeur.

MAGNIFIQUE HÔTEL DE PREMIER ORDRE,

Situé en face du jardin public de l'Esbekié et du Théâtre de l'Opéra

Le New-Hotel vient d'être remis à neuf et complètement remeublé avec tout le luxe et le confort désirables.

Salons de lecture, Salon des Dames, Salon arabe,

Salle de bal, Fumoir, grand Bar oriental, Bains chauds et froids.

20 FRANCS PAR JOUR.

—Arrangements avantageux pour familles.—

Omnibus à l'arrivée de chaque train.—INTERPRÈTE.

GALLE FACE HOTEL,

COLOMBO.

THE COOLEST HOTEL IN COLOMBO.

THIS FAVOURITE HOTEL is beautifully situated by the Sea in the best part of Colombo.

It adjoins the large Esplanade and Promenade known as Galle Face, and is within five minutes' drive of the Harbour.

The Hotel always enjoys a cool and delightful sea breeze.

Upstairs, Bedrooms afford cool and refreshing sleep in the hottest weather.

A SEA WATER SWIMMING BATH IN THE COMPOUND.

Excellent Cuisine. *Carriages.* *Billiards.*

TERMS MODERATE.

J. MAITLAND & CO., Proprietors.

BRISTOL HOTEL, COLOMBO,

CEYLON.

THIS HOTEL occupies one of the most prominent sites in Colombo. It is within two minutes' walk of the Landing Jetty, in the immediate vicinity of the Custom House, Post and Telegraph Offices, and one mile from the Railway Terminus.

SPECIAL ATTENTION IS PAID TO THE CUISINE, which is known for its uniform excellence; the Wines have been carefully selected. Private Dining Rooms and cool Verandahs.

VISITORS to the "BRISTOL" will find it the most convenient and best appointed Hotel in the East.

F. M. DAWSON, *Secretary.*

Telegrams:—BRISTOL, COLOMBO, CEYLON.

TURKISH BATHS CLOSE TO THE "BRISTOL."

NOTICE.

THE CEYLON TEA COMPANY, LIMITED.

Under the Patronage of the

Head Office:

KANDY, CEYLON.



A. PHILIP, *Secretary*,
KANDY.

* *Registered.*

Drink Pure Ceylon Tea at the Ceylon Tea Kiosk,

ON THE LEFT OF THE PASSENGER LANDING JETTY,

And opposite the Grand Oriental Hotel, COLOMBO, where

PURE CEYLON TEA

In the CUP or PACKET can at all times be obtained.

ICES, [illegible]

TARIFF IN THE KIOSK.

HOW TO MAKE PERFECT TEA.

Use fresh Boiling Water—that is, fresh water that has just commenced to boil.

Have the Tea-Pot Hot; pour the boiling water on the Tea, and in five minutes pour into cups or another hot Tea-Pot. Do not let the Tea stand with the leaves longer than five minutes.

PURE CEYLON TEA.

Visitors to Ceylon and others can obtain this favorite and well-known Tea with a guarantee of purity and quality at **The Ceylon Tea Kiosk, York Street, Colombo,** and at the Registered Office of the Company, **42, King Street, Kandy.**

	X	Y	Z		X	Y	Z
1-lb. Packet Tea..	Rs. 1·25	Rs. 0·95	Rs. 0·80	20-lb. Boxes Tea..	Rs 24·00	Rs. 18·00	Rs. 15·00
5-lb. Boxes „	„ 6·00	„ 4·50	„ 3·75	50-lb. Half-Chests	„ 45·00	„ 35·00	„ 30·00
10-lb. „	„ 12·00	„ 9·00	„ 7·50	100-lb. Chests ..	„ 90·00	„ 70·00	„ 60·00

XX.—EXTRA SUPERFINE TEA.

1 lb. Packet .. Rs. 2·00 | 5 lb. Boxes .. Rs. 10·00

* *Every Packet, Box, and Chest bears the Trade Mark of the Company shown above.*

English and other Money

BRITISH INDIA HOTEL, COLOMBO.

This Establishment is under Experienced Management, and contains Clean, Airy Bedrooms, Spacious Dining Hall, Ladies', and Public Sitting Rooms, and is celebrated for its Excellent Cuisine, Choice Wines, and Cleanliness. It is well-known as an Hotel where every want and requirement of Passengers can be satisfactorily supplied.

This First Class Hotel is situated on the Sea Front, near the Flag Staff, is unrivalled for coolness and position, and commands a splendid view of the Breakwater and Harbour. It is within a few minutes of the principal Railway Stations, and four minutes' walk from the Landing Jetty.

TERMS MODERATE. CARRIAGES ALWAYS READY.

Meals at all Hours and Special Suppers Provided at an Hour's Notice.

Passengers will find the BRITISH INDIA HOTEL the most convenient Calling Place.

First Class Billiards, the Tariff for which is the Lowest in Colombo.

G. V. LAMBE, *Manager.*

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THE BEST HOTEL IN PERTH & NEAREST THE STATION.

HAS the best Table, the best Billiard Room, best Bar, and best Accommodation for Visitors of any Hotel in the Colony.

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The Colombo Public Hall Company, Limited.

This Company's Spacious Hall, capable of accommodating an audience of 500 persons, and suitable for

Concerts, Dramatic Performances, and Dances,

can be engaged on the most favourable terms, to be ascertained from the

Honorary Secretary, COLOMBO.

TRAVELLING COMPANIES PLEASE NOTE.

W. D. PEACOCK'S

FRUIT EXPORT AGENCY,

NEW WHARF, HOBART.

Tasmanian Fruits forwarded on account of Producers to the United Kingdom, America, and the Colonies.

ANNUAL SHIPMENTS EXCEED 100,000 BUSHELS.

Original Account Sales and Proceeds promptly remitted to Growers.

CHARGES MODERATE.

THE WESTERN AUSTRALIAN BANK.

ESTABLISHED 1841.

Authorised Capital, £250,000; Paid-up Capital, £70,000.
Reserved Profits, £98,491.

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London Agents:—THE BANK OF ADELAIDE, 79, CORNHILL, E.C.

Directors.

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W. F. LOTON, Esq., M.L.A. W. D. MOORE, Esq. J. B. ROE, Esq.
J. F. STONE, Esq.

General Manager—H. D. HOLMES. **Accountant**—JOHN F. LAW.

Branches in Beverley, Bunbury, Busselton, Dongara, Fremantle, Geraldton, Newcastle, Northam, York.

AGENTS in all the Australian Colonies, New Zealand, Tasmania, and in all parts of the World.

The Bank Purchases Bills in England and other Countries, issues Drafts on its several Agents, and transacts every description of Banking Business.

The Tasmanian Fruitgrowers' Co-operative, Shipping, and Agency Company, Limited,

HOBART.

(Registered as a Limited Liability Company under the "Companies' Act, 1869.")

Directorate.

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RUSSELL YOUNG, Esq., *Vice-Chairman.*

A. HILMER CATO, Esq. — Dr. BENJAFIELD.
A. R. BOWCHER, Esq. — JOHN HAY, Esq., No. 2.
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Solicitors.

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THE BANK OF AUSTRALASIA.

Manager.

J. LOWE CONACHER.

Fruit Shipped to European, American, Intercolonial, and all Foreign Ports.

Correspondence invited from Fruit Centres in all Foreign Ports where the Company is not already represented. Bank References must accompany all enquiries.

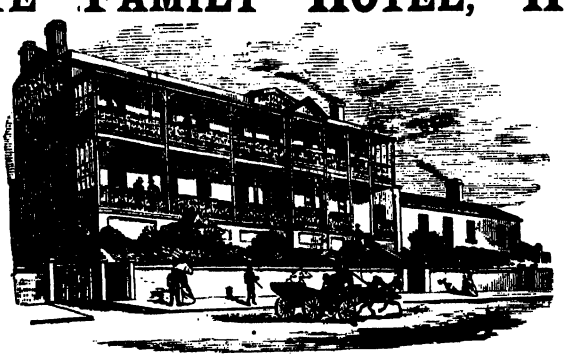
AGENTS IN TASMANIA FOR—

THE ANGLO-AUSTRALASIAN STEAM NAVIGATION COMPANY.

PRIVATE FAMILY HOTEL, HOBART.

Pressland House —AND— Cottages.

Mrs. CLEMENTS, *Proprietress.*



Pressland House —AND— Cottages.

Mrs. CLEMENTS, *Proprietress.*

Suites of Apartments—each containing a Piano.

TABLE D'HÔTE.

TERMS: Per Day or Week, according to arrangement.

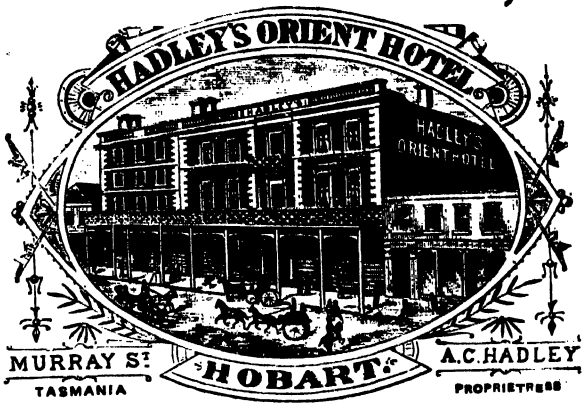
Public Drawing Room and every convenience appertaining to a First-class Establishment.

FINE ASPHALTE TENNIS COURT.

This Establishment commands a splendid view of the River, and is within five minutes' walk of the Railway Station, Wharves, and the centre of the Town.

HADLEY'S ORIENT HOTEL, HOBART.

The best and most centrally-situated Family and Commercial Hotel in Tasmania.



Visitors from England, Foreign Countries or the neighbouring Colonies will find every comfort and convenience.

SUITES OF PRIVATE APARTMENTS (with Piano in each).

PUBLIC DRAWING-ROOM FOR LADIES.

COMMERCIAL AND READING ROOMS.
SAMPLE ROOMS FOR COMMERCIAL TRAVELLERS.
FIRST-CLASS BILLIARD SALOON, BATHS, &c.



Heathorn's Hotel,

LIVERPOOL STREET, HOBART.

(Six doors from Railway Station.)

THIS FAMILY, TOURIST and COMMERCIAL HOTEL is situated close to the Railway Station, Domain, and Sea Water Baths.

Suites of Rooms with separate attendance if required.

This Hotel is recently erected, with every convenience for visitors.

HOT and COLD BATHS.

Private arrangements for Visitors and Boarders from one month and upwards.

COMMERCIAL GENTLEMEN AS ARRANGED.

WELL LAID-OUT GARDEN AND BOWLING GREEN.

TERMS MODERATE.

H. NICKOLLS,

Legal Manager, Accountant & Auditor,

Agent Reuter's Telegram Co., Ld.,

Patent Agent,

Elizabeth Street,

HOBART,

TASMANIA.

TASMANIA.

1. Description.—The Colony of Tasmania is situated in the Southern Hemisphere, between the parallels of 40° 33′ and 43° 39′ south latitude, and between 144° 39′ and 148° 23′ meridians of east longitude, and corresponds nearly with Southern France and Northern Italy in northern latitude. It is irregularly heart-shaped, and occupies an area of 26,215 square miles, *i.e.*, about the same extent as Scotland.

2. Land.—Persons desirous of obtaining information with respect to Crown Lands open for sale or lease, can obtain full particulars from the Crown Lands Offices at Hobart and Launceston. The "Crown Lands Guide," published yearly, contains all the necessary information respecting the quality and extent of land open for purchase or selection, together with terms of purchase. This work may be obtained at the Crown Lands Office, Hobart, or from the leading booksellers in Hobart and Launceston, and may be seen at the Office of the Agent General for the Colony.

3. Products.—Among the products of the Colony, the following are the most important: Tin, Gold, Silver, Lead, Wool, Timber, Bark, Fruits of various kinds, Hops, Wheat, Oats, Barley, Hay, and Potatoes. The export of minerals forms a large proportion of the trade of the Colony, and now that the Silver Fields on the West Coast of Tasmania are engaging so much attention, it is anticipated that the preparation of Silver for export will make an important increase in the trade of the Colony.

Important Coal Fields exist in various parts of the Colony, but little has been done yet to develop them. The seams vary from 2 feet to 12 feet in thickness, some of which are of very fair quality.

Fish abound in the lakes, rivers, and seas, some, such as the "*Hobart Trumpeter*," of excellent quality. There are over 220 species of fish known to naturalists, and about one-third of these are edible. Tasmania has succeeded in the acclimatisation of the following important European and American fishes: *Salmo salar*, *S. trutta*, *S. fario*, *S. fontinalis*, *Perca fluviatilis*, *Tinca vulgaris*. The most important native timber trees are the Blue Gum, the Huon Pine, and the Blackwood.

4. Education.—The State System of elementary education is secular and compulsory for children at the school age (7 to 13 years). In 1890 there were 240 State schools, with an average daily attendance of 8,898 children. Besides the State schools there were in the same year private schools with a good muster roll.

5. Railways.—During the year 1891 there were 376½ miles of railway open for traffic, and 43¾ miles in course of construction. These lines are constructed upon the 3′ 6″ gauge, and connect the principal centres of population.

All general information about the Colony can be obtained on application to the AGENT GENERAL FOR TASMANIA,
5, VICTORIA STREET, LONDON, S.W.

ERNEST T. SIMONDS,

Stock and Share Broker,

16, Elizabeth Street,

HOBART,

Member of the Hobart, Launceston, and

Mt. Zeehan Exchanges.

LONDON AND SOUTH WESTERN RAILWAY.

THE SHORTEST ROUTE

— BETWEEN —

LONDON & PLYMOUTH.

The only Railway route between Plymouth, Portsmouth, and Southampton, and the South West and South Coasts.

THE LONDON AND SOUTH WESTERN RAILWAY is in direct communication from Plymouth to all parts of Great Britain. IT IS THE SHORTEST AND MOST DIRECT ROUTE TO LONDON, and passes through some of the finest scenery in Devonshire.

THE COMPANY'S STATIONS IN PLYMOUTH ARE "FRIARY," "MUTLEY," AND "NORTH ROAD," the latter being about 15 minutes from Millbay Pier, where all ocean passengers are landed.

EXPRESS "SOUTH WESTERN" TRAINS RUN FROM THE FRIARY, MUTLEY, AND NORTH ROAD, ALSO DEVONPORT STATIONS to Exeter, Yeovil, Salisbury, Portsmouth, Southampton, London, and all parts of the country.

FAST EXPRESS TRAIN; LONDON TO PLYMOUTH, IN 5½ HOURS.

Reduced Fare Tickets

For Ocean Passengers from Plymouth to London can be obtained at the Central Offices, Bank of England Place, Plymouth, and also at the North Road and Friary Stations.

Friary Station, Plymouth.

The New Plymouth Station at the Friary is open for Passenger, Goods, Fish and Cattle traffic, and a fast through service of Trains runs between Plymouth and London and all parts of the Kingdom.

Passengers, Goods, &c., will also be conveyed between Plymouth and Bristol and Bath, *viâ* Templecombe, and to the Midland Counties and the North of England, either *viâ* the Midland, the London and North Western, or Great Northern Railways.

Trucks containing Goods for shipment go direct into the Plymouth Docks.

Every information as to the Train Service, Fares, &c., can be had on application to—

Mr. F. P. WHARTON, Offices, Bank of England Place, Plymouth; Mr. R. SAMSON, Station-master, Devonport Station and North Road Station, Plymouth; Mr. AVERY, Station-master, Friary Station, Plymouth; the DISTRICT SUPERINTENDENT, Queen Street Station, Exeter; or to Mr. G. T. WHITE, Superintendent of the Line, Waterloo Station, London, S.E.

WATERLOO STATION,
LONDON, 1894.

CHAS. SCOTTER, General Manager.

MELBOURNE.

ESTABLISHED 1854.

MULLALY & BYRNE,

Customs and Shipping Agents.

Head Office - - CUSTOM HOUSE.

Goods Cleared and Delivered ex Ship or ex Bond, and all Branches of Shipping Agency transacted.

Branch Office - 350, FLINDERS LANE.

PARCELS promptly forwarded to all parts of the World at Minimum Charges.

LUGGAGE Collected and Despatched, Cleared, and Delivered, or taken into Store.

N.B.—MULLALY & BYRNE, under authority from the **Orient Steam Navigation Company,** attend the Arrival and Departure of all their Steamers, in and from the Port of Melbourne.

Travellers' Information Office - - FREE STORE.

Furnishing & General Ironmongers,

Corner of COLLINS & SWANSTON STREETS,

(OPPOSITE THE TOWN HALL)

MELBOURNE.

House Furnishing Ironmongery. Table and Pocket Cutlery.

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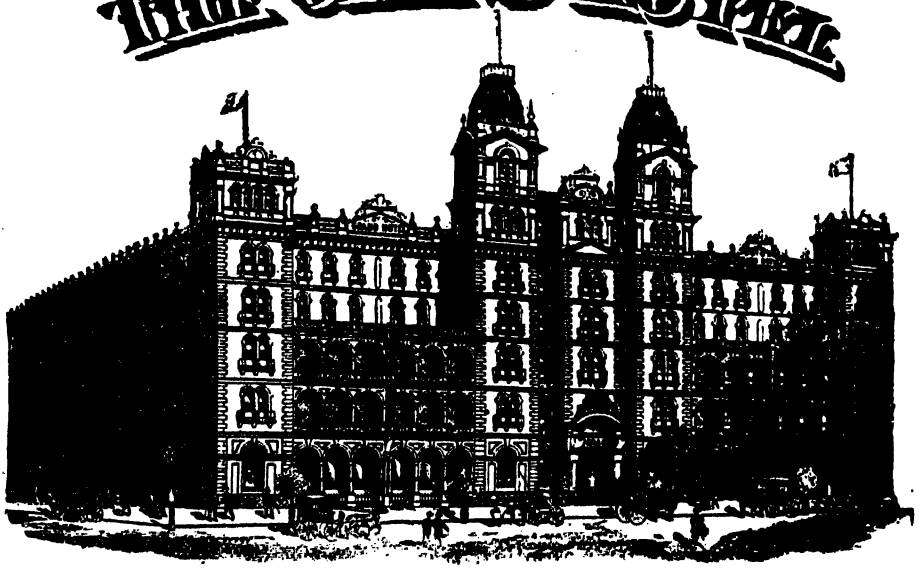
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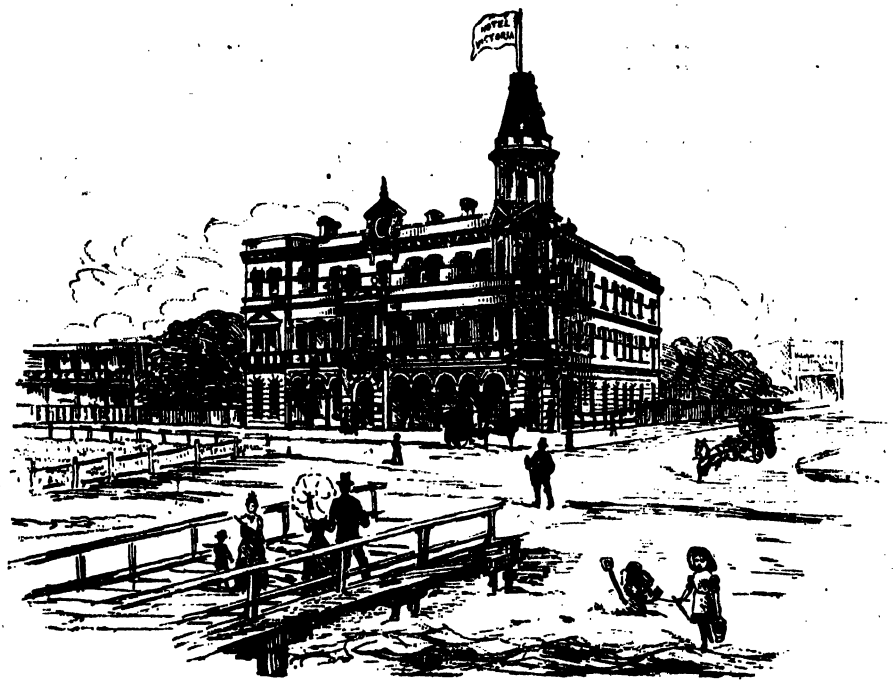
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THE CONDITIONS UNDER WHICH CROWN LANDS MAY BE ACQUIRED BY SELECTION IN QUEENSLAND ARE SUBSTANTIALLY AS UNDER.

AGRICULTURAL FARMS.—Selections not to exceed 1,280 acres; term of lease, 50 years; rent 3d. per acre minimum, and liable to reassessment at 10 years and every 5 years afterwards, but no increase to be over 50 per cent. on the rent of the preceding period; cost of survey payable at time of application. Selector must be 18 years of age, and unmarried if female; must continuously occupy the land, either by self or registered agent, and must fence or make other equivalent improvements within 5 years after selection. The land may be made freehold on payment of the prescribed price (not to be less than 15s. per acre) after residence by one lessee for 5 years, or of two or more successive lessees for a period of 10 years, immediately preceding application to purchase. If this privilege is not availed of within 12 years after selection, the price will be readjusted like the rent. All rent paid during the period of personal residence to be counted as part payment. The holding, after improvements effected, may be sold, subdivided, mortgaged, or, with the consent of the Land Board, sublet.

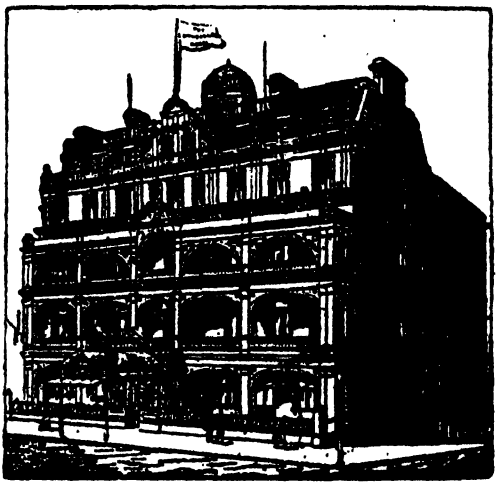
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UNCONDITIONAL SELECTION.—Selections not to exceed 1,280 acres. Subject to no conditions or restrictions as to age or condition of selector. Purchasing price to be not less than £1 per acre, and payable in 20 equal instalments. Cost of survey to be paid with application.

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SALES BY AUCTION.—Land may be purchased at or after auction in areas not exceeding 320 acres on 3 years terms without interest; minimum price, £1 per acre for agricultural, and 10/- for other land. Or when more than 20 miles from railway or navigable stream, in areas of 5,120 acres, at price not less than 10/- per acre, with interest if on extended terms beyond 6 months.

N.B.—Full information can be obtained gratis, and pamphlets of Land Acts and plans of lands open at a small charge, from the Government Agent of each district, or at the Department of Public Lands, Brisbane.



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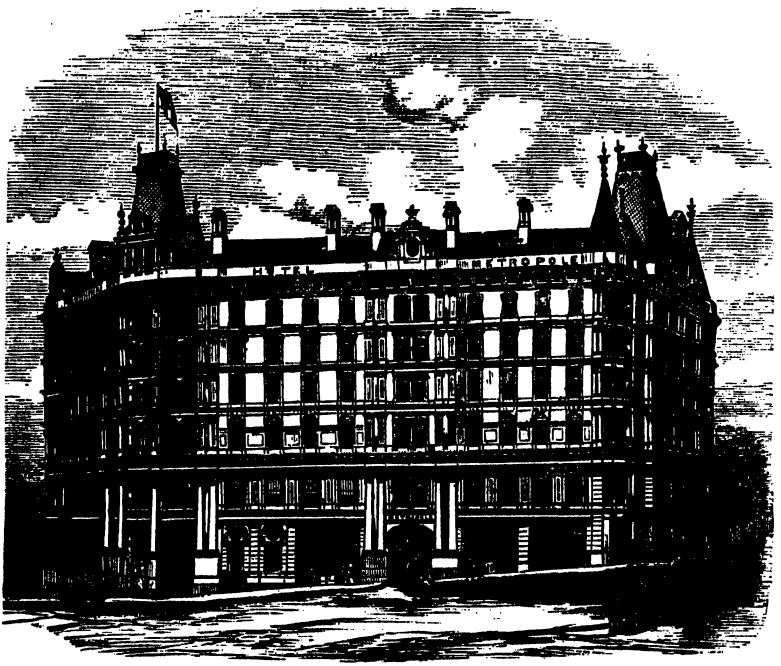
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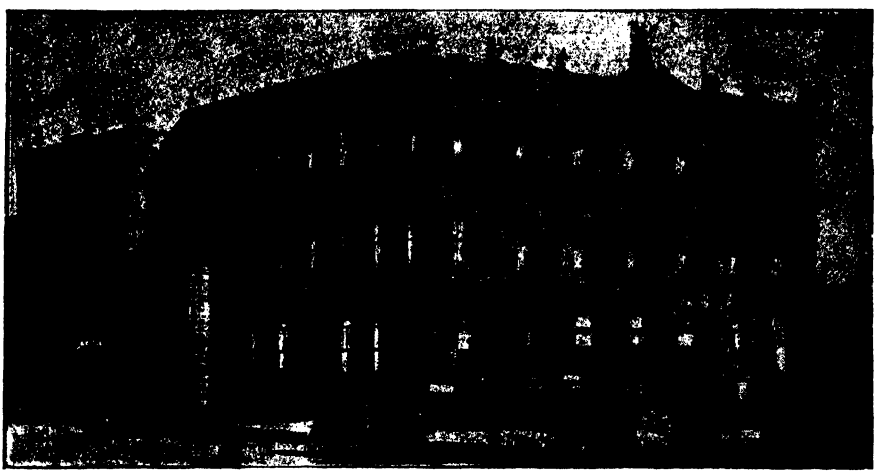
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