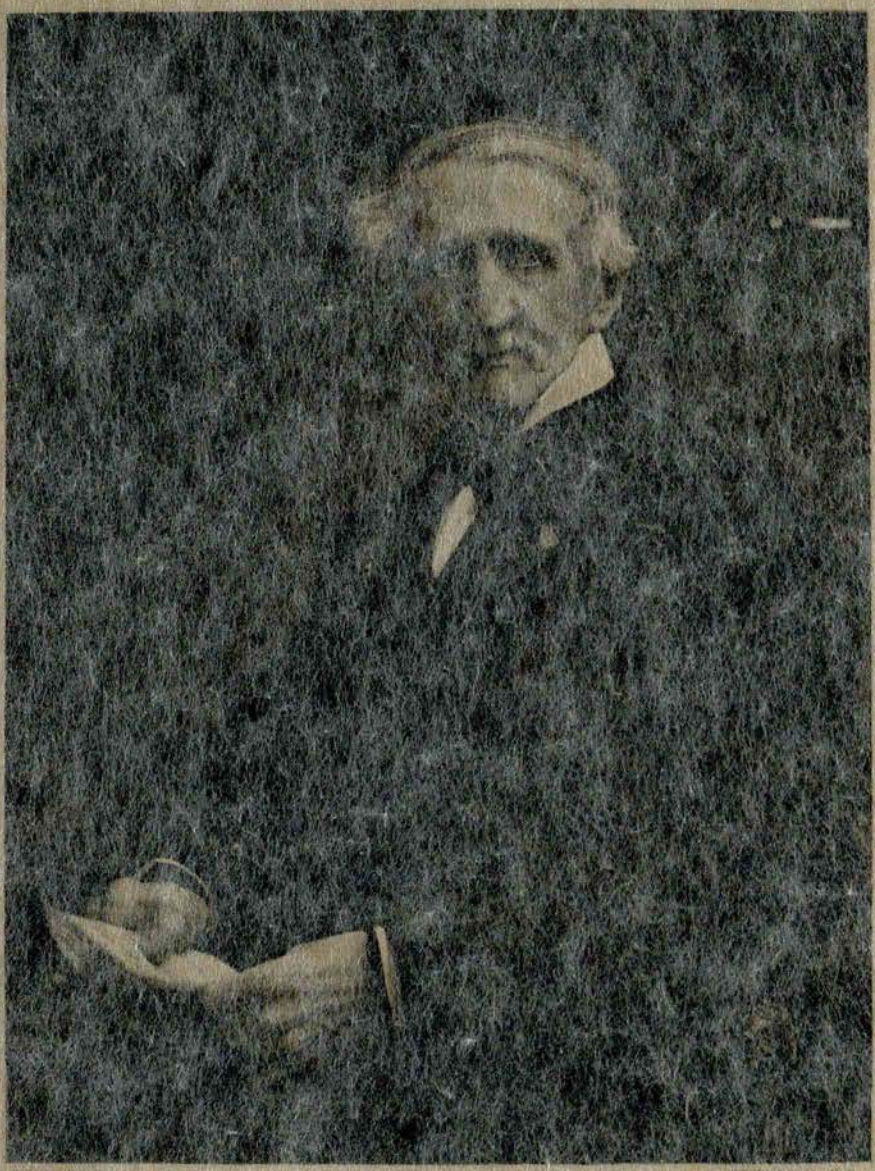
To the Right Hon^ble
Lord Curzon
Viceroy of India
with R Scott's
Cheerful Regards
London 24^th October 1900.

SIR ARTHUR COTTON
R.E. K.C.S.I



Arthur Cotton

GENERAL SIR ARTHUR COTTON

R.E. K.C.S.I

HIS LIFE AND WORK

BY HIS DAUGHTER

LADY HOPE

WITH SOME

FAMINE PREVENTION STUDIES

BY

WILLIAM DIGBY C.I.E

PORTRAITS MAPS AND ILLUSTRATIONS

His "were imperial works and worthy kings"—MILTON

LONDON
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TO

MY BELOVED MOTHER

WHOSE INTEREST AND SYMPATHY

THROUGH A LONG LIFE

CHEERED AND SUPPORTED

MY FATHER

IN HIS ARDUOUS TASKS

FOR THE BENEFIT OF

HUMANITY

THIS RECORD OF HIS

LIFE AND WORK

IS

DEDICATED

Preface

IN placing before my readers the Memoir of my Father, and his life work for the benefit of India, in its deliverance from the disastrous effects of Famine, as well as its increased prosperity, I have felt that I am only undertaking a task which it was my bounden duty to accomplish to the best of my ability.

So near his heart lay this ever burning question, so fervent were his desires that his schemes for a far more general irrigation of the country should be carried out to the full, and so heart-breaking was the grief to him, as time rolled on, that the absolute fulfilment of his dearest wishes was either postponed, or neglected, that when his long and earnest life had closed, I felt it incumbent upon me to obey the request he had so often made, in his own touching and pathetic way, that I would gather together the various papers and documents which he had left, and make use of them for the benefit of India, and the supplying of its vast needs.

A duty thus inculcated by one so beloved, whose slightest wish had always been a law to me, could only be undertaken in the spirit of loyal obedience, and a true desire to further his highest ideals.

My father was truly an empire maker, as he was an empire lover; no one ever more zealously longed for the spread of England's civilisation, her privileges and her blessings over distant lands where, hidden too often behind the curtain of natural beauty, or surface intellectuality, there lies a hidden depth of misery and darkness, such as we, in our favoured country, can scarcely know.

With regard to India's temporal interests, he always felt that vast quantities of water might be saved from rushing wastefully into the ocean by tank storage and canal distribution, thus both irrigating and navigating the country as a preliminary to all questions of railway locomotion. "First," he would say, "enrich the country, and then lay down railway lines as advisable."

All these points are fully entered into in the book which I have ventured to place before the British public. Careful calculations are given as regards the increase of revenue by these simple means; and when we compare the statements of profit and loss we have to throw into the famine balance the gigantic consideration of the loss of human life, which, after all, is infinitely more precious than any monetary revenue, or the value of funds spent on irrigation works.

So serious is this subject, so vast in its various phases, that it commands from us a definite and diligent enquiry as to the possibility of lessening these dire evils, and effecting a universal improvement throughout our Indian possessions. My father used sometimes to say,—"I am a man of one idea"; but though it was true that the

question of Indian irrigation was the leading feature of his public life, he had a vast number of other interests, every one of them tending towards the benefit of mankind, and the increased prosperity of our own nation, with its multitude of dependencies, and its ever-widening interests throughout the world. He carried on his own shoulders, as few men do, the weight of the needs of others,—other men's sorrows affecting him as though they were his own; in fact, through sheer sympathy and a strong sense of responsibility, he *felt* them to be his own.

In his ceaseless study of these great considerations he discovered remedies, and his practical nature seemed to show him at once how these remedies were to be applied.

Now that his lips are silenced, and his pen is laid down, I fervently ask that my readers may themselves look into these great questions, and study them from his point of view, in the light of information now freshly placed before them.

With regard to the writing of the book, I have to acknowledge very gratefully the help given to me by Mr. William Digby, C.I.E., the devoted ardour he has shown in the arrangement of some of its chapters, and the information he has collected in support of this great question of irrigation in India, and its consequent prevention of famine.

I also thank Mr. Walch for his kindness in permitting me to use quotations from some of the pages of his book, on *The Engineering Works of the Godavari Delta*, with photographs of both its scenery and irrigation systems,

and I am indebted to the India Office for latest particulars regarding irrigation canals which have been incorporated in the irrigation and navigation map.

To other friends who have shown their sympathy with me, and have helped in various ways to forward my labours in connection with this volume, I here tender my grateful and lasting thanks.

E. R. HOPE.

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IRRIGATION AND NAVIGATION MAP OF INDIA, prepared by Sir A. Cotton, and brought up to date from statistics at the India Office	*in pocket at end of book*

"If we have done our duty at least to this part of India, and have founded a system which will be a source of strength and wealth and credit to us as a nation, it is due to

ONE MASTER MIND,

which, with admirable industry and perseverance, in spite of every discouragement, has worked out this great result. Other able and devoted officers have caught Colonel Cotton's spirit and have rendered invaluable aid under his advice and direction, but for this first creation of genius we are indebted to him alone.

"Colonel Cotton's name will be venerated by millions yet unborn, when many, who now occupy a much larger place in the public view, will be forgotten; but, although it concerns not him, it would be, for our own sake, a matter of regret if Colonel Cotton were not to receive due acknowledgment during his lifetime."—*Minute by the Government of Madras*, SIR CHARLES TREVELYAN, *Governor*.

An Appreciation of Sir Arthur Cotton

THE biographies of eminent Anglo-Indians constitute a large library in themselves. Probably there is not one of the biographies of which its subject was not worthy of the honour of permanent record. India has afforded unequalled opportunities for the display of the highest altruistic qualities of which our race is capable. "Englishmen and Englishwomen will work, and have worked, for India until they drop."[1] In the foremost rank of such Englishmen, Arthur Thomas Cotton stands second to none. It is no biographer's enthusiasm which declares that he is, without doubt, the greatest benefactor of British birth the Indian people have ever known. More people have had enough to eat day by day, have worn sufficient and comfortable clothing, have lived in good houses, have had something to spare for the conveniences of life, because Sir Arthur Cotton laboured for India, than can be placed to the credit of any other man of whom I have read or heard. Again, I say this is no biassed eulogium. In chapter XIV. of this work will be found, in statistical form, so far as that is possible, what Arthur Cotton's work

[1] Mr. Vaughan Nash, Special Famine Correspondent of the *Manchester Guardian*, in letter dated April, 1900.

represents to the Indian Government and to the people themselves. To that chapter I ask attention if any reader should consider my words overstrained.

Sir Arthur Cotton's influence is ineffaceably stamped on three portions of the eastern coast of the Madras Presidency. What is true of this region might have been true, in a modified measure, of many other parts of India, especially of some of those provinces which now (July, 1900) are the scenes of awful suffering, had Sir Arthur Cotton's ripe experience not been overborne by administrative jealousy and by official unacquaintance with what really could be done by means of irrigation in almost every part of India.

In the homes of many thousands of families in India, living in comfort, "Cōtōn,"[1] with what he did, is an honoured, almost worshipped, entity; in Britain, it is probable that, owing to his manifold activities by voice and pen throughout many years, no other Anglo-Indian has ever been so widely known. A discussion recently took place in a London assemblage on the causes of famines in India. Incidentally, Sir Arthur Cotton's name was mentioned. Subsequently, one of the leading public men of the metropolis remarked: "Sir Arthur Cotton's name has been mentioned. We, here, know Sir Arthur Cotton; we believe in Sir Arthur Cotton and in what he did for India. He came to us here, and he told us what India needs; we want to see his policy prevail."

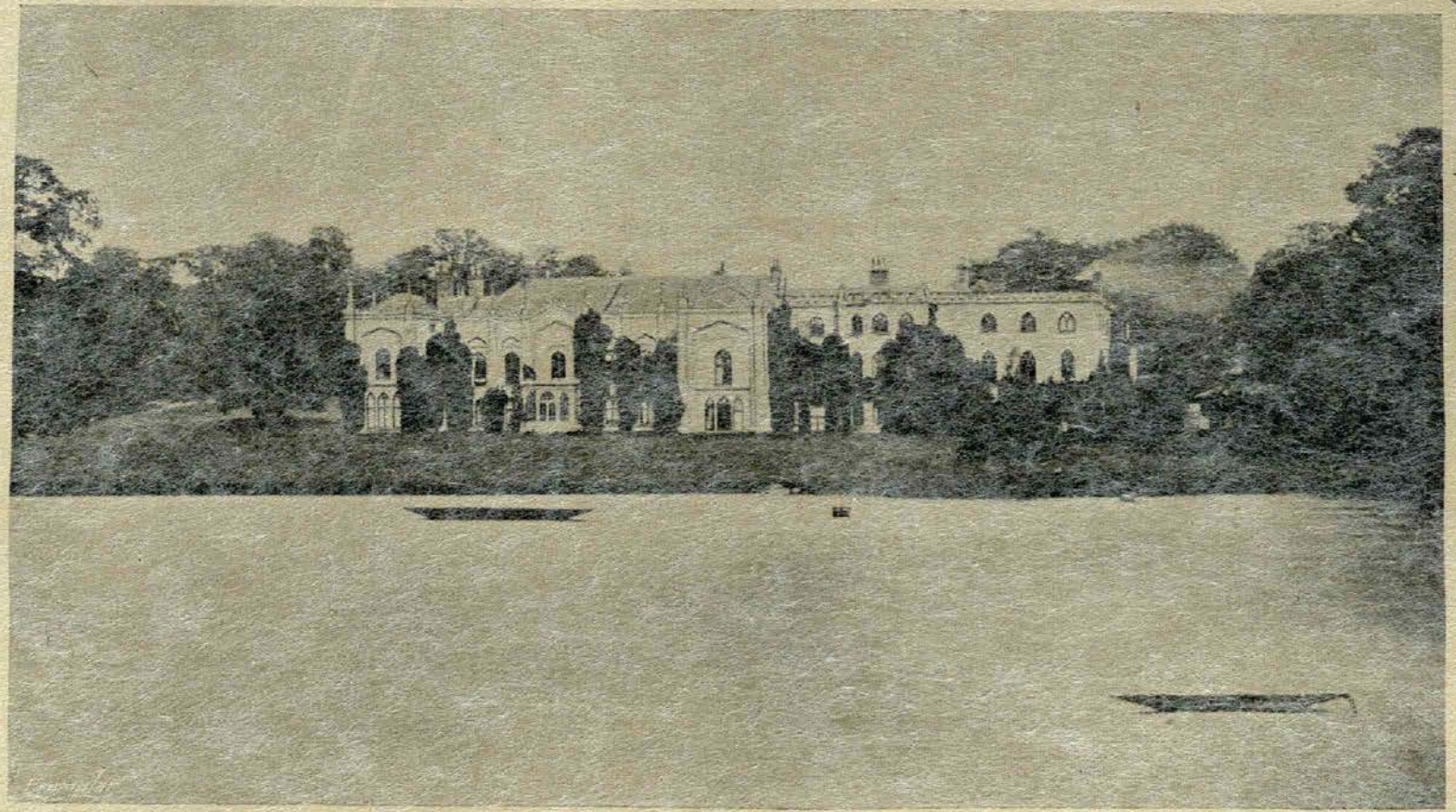
What Arthur Cotton did in India was sorely needed. What he would have done is still more sorely needed.

[1] In one of his letters, quoted later, Sir Arthur Cotton asks his correspondent whether the people, to whom reference was made, could really pronounce the short "o," adding that in Northern Madras his name was pronounced as though the "o" were long.

Because his counsel was not followed, again and again have destitution and hideous suffering overtaken vast multitudes, while the progress of one-sixth of the population of the whole world has been arrested. What has been will again be. A few years hence, an even more disastrous famine than that of to-day will afflict our Indian fellow-subjects, a continuing decadence of country and people will prevail, *unless* the readers of this biography, and the English people generally, determine that Sir Arthur Cotton's works shall follow him.

Therefore

is it that this biography is offered to Arthur Cotton's countrymen and countrywomen, with the hope that its narrative of his work and teaching will carry conviction to many minds and produce such beneficent consequences that the present sorrowful condition of India's population shall, so far as widespread irrigation can ensure this, become a matter of regretful historical interest only.



COMBERMERE ABBEY.

CHAPTER I

Family History—A Notable Band of Brothers —Early Days and Characteristics

GENERAL SIR ARTHUR COTTON, R.E., K.C.S.I., was born on May 15, 1803. He was the tenth son of Mr. Henry Calveley Cotton, who was himself the tenth son of Sir Lynch Cotton, the fourth holder of a baronetcy created, in 1677, in the person of Sir Robert Cotton, K.B., M.P. for Cheshire. The family is of considerable antiquity. As early as the twelfth century, the Abbey of Combermere, with its "surrounding demesne, lands, woods, and timbers," is described by an early historian. In the year 1153, its first abbot was "still surviving." He was followed by other abbots, several of whom were granted fresh privileges and additional lands. In the year 1535, "the site of the monastery, with its church, bell tower, the lake of Combermere, and cemetery, was granted to George Cotton, and Mary his wife, by the King's letters patent," the king being Henry VIII.

Through the handsome Catherine of Beragne the descent of the Cottons may be traced from the Plantagenets. They appear to have served their king and country through several centuries. Sir George Cotton, the second son of John Cotton, of Cotton, in Shropshire, was an esquire of the body to Henry VIII. His younger brother, Sir Richard Cotton, Knight Comptroller of the Household, was a Privy Councillor in the reign of Edward VI. Henry Cotton, younger son of Sir Richard Cotton, was appointed by Queen Elizabeth to the see of Salisbury.

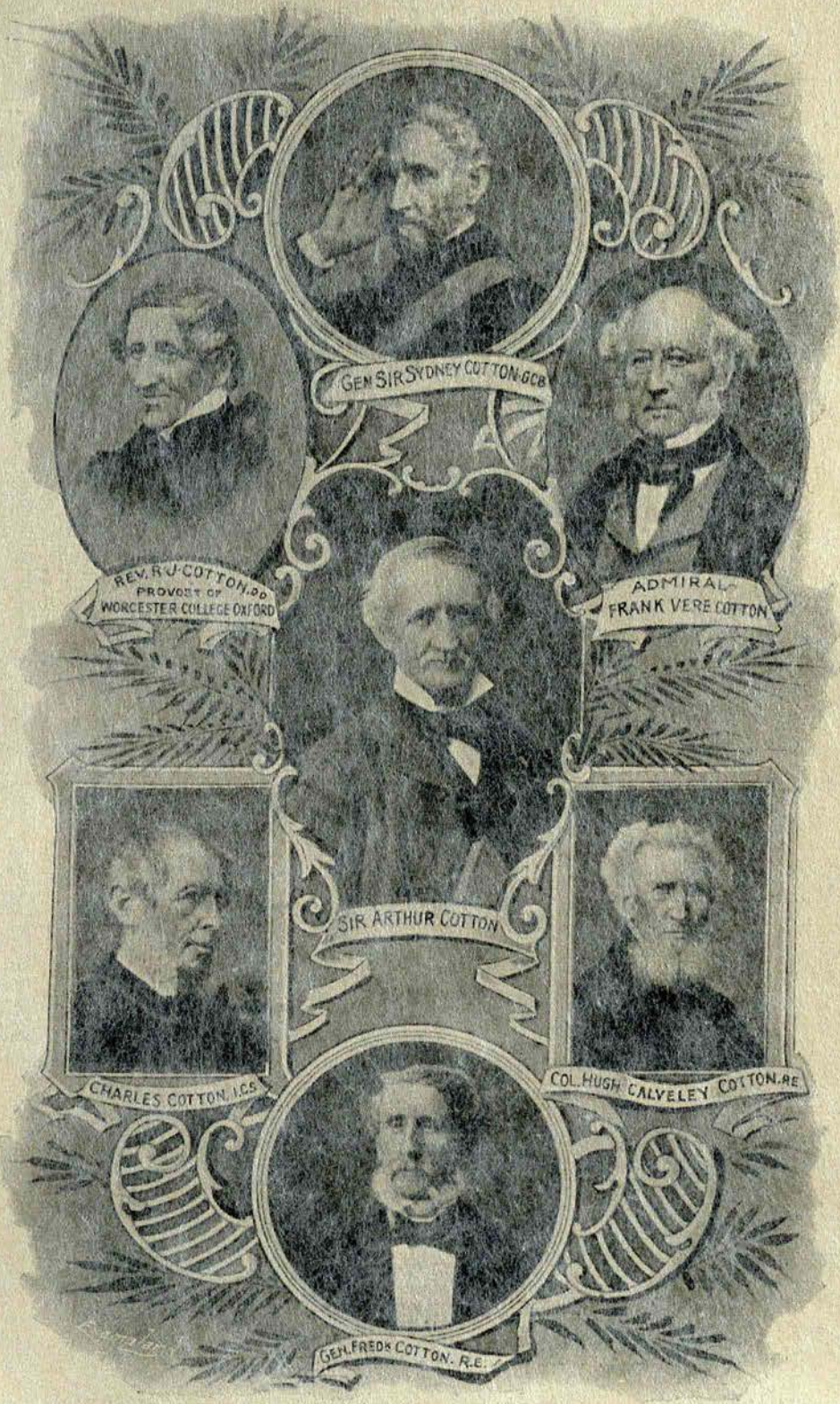
Sir Robert Cotton, grandson of Sir Richard, added

largely to the wealth and importance of the family by his marriage with Hester, daughter of Sir Robert Salisbury, of Llewenny, county Denbigh.

Sir Robert Salisbury Cotton, his grandson, is described as "a most frank and hospitable gentleman, and as having dispensed a daily hospitality even more than proverbially Cheshire." His descendant, Sir Stapleton Cotton, distinguished himself in military service in 1817, and received the title of Baron Combermere. Like his kinsman, the subject of this memoir, Sir Stapleton gained his distinction in India. He was the hero of Bhurtpore. He displayed great personal bravery, even wished to lead the storming-party when a breach had been made. The would-be stormer of the breach was Commander-in-Chief in India at the time! He was afterwards Field-Marshal, Constable of the Tower, and Colonel of the 1st Life Guards. This is the testimony which is given to his courage: "Lord Combermere, commonly so careful of the life of the humblest soldier, too imprudent with his own, could with difficulty be restrained from leading the foremost of the stormers of the breach his sappers and miners had made in the walls."

Arthur Cotton was not the only distinguished member of his family. Six of his brothers made their mark in their day, and did useful service for mankind. A portrait of each of them, with Arthur in the centre, faces this page. Of his brothers Sir Arthur has left some record.

Sir Sydney Cotton was a very able officer. He commanded at Peshawur during the Mutiny, and had, as prisoners, five thousand of the mutineers, whom he had disarmed. Among his other services was the raising of the 21st Lancers. When he had been some months in command at Peshawur, a friend of mine sent one of the senior officers of the Adjutant-General's Department at Calcutta, and asked: "How is Sydney Cotton getting on in Peshawur?" The reply was: "This is the way he is getting on. Before he went there we never had an hour's



SIR ARTHUR COTTON AND HIS BROTHERS.

freedom from anxiety, night or day, about the place Since he went there we have never had one hour's anxiety." Happily he had to work with two of the finest men in India at the time: Sir Herbert Edwardes, the Commissioner, and General Lushington. Peshawur was at that time the station on which more depended than upon any other. It was one of the principal providential facts in the Mutiny that the defence was in the hands of three such officers as those I have named.

In the second volume of Bosworth-Smith's *Life of Lord Lawrence*, the references to General Cotton are many. John Lawrence found in the intrepid commander at Peshawur one who seconded all the stern measures which the civil ruler felt necessary. The manner in which incipient mutiny was checked by some of the disaffected regiments being sent to outpost duty "against an imaginary invasion of the Mohmunds," or nearly marched off their legs "in their amazing race for Delhi," was masterly. Lord Lawrence's biographer remarks that it was fortunate for Lawrence himself that he had such trustworthy coadjutors. ". . . in Edwardes, in Nicholson, in Cotton, at Peshawur, he had admirable lieutenants, men with whom to think was to act, to see a danger was to overcome it, men who worked behind his back as hard as, perhaps harder than, they would have worked under his eye."[1] Again: "No officer could have managed better than Brigadier S. Cotton, and if he is superseded, I do not know what will happen."[2]

One most important matter provided occasion for a difference of opinion between Lawrence on the one hand, and Cotton, Edwardes, and others, on the other. The peril which existed while Delhi remained untaken led Lawrence to look ahead, and to seek permission from Lord Canning to abandon Peshawur if he thought well. While he was in correspondence with the Viceroy, he wrote to Edwardes: "Pray think of what I have said, and consult Brigadiers

[1] *Life of Lord Lawrence.* By R. Bosworth-Smith, M.A., vol. ii. p. 45.

[2] *Ibid.*, p. 69.

S. Cotton and Nicholson, but nobody else. No man will retrace his steps more unwillingly than myself. But there is a point when to hold on savours more of obstinacy than of wisdom." General Cotton was not convinced, nor were the other officers consulted. They could not conceive that, under any circumstances, it was wise to abandon Peshawur. They resisted the civil head of affairs by argument and persuasion. Lord Canning took a like view with those who were for holding on, and, on August 7, telegraphed to Lawrence, "Hold on to Peshawur to the last." By this time, however, the tide had turned against the mutineers, and Lawrence no longer urged even the possibility of retirement. It may be interesting to add that the Prince Consort, at Windsor, said to Sir John Lawrence, "I have read your paper on the abandonment of Peshawur, and entirely agree with you."

Richard Lynch Cotton was educated at the Charterhouse, and became an undergraduate at Worcester College in Oxford. In 1815 he was elected to a Fellowship at Oriel, and in 1823 became Vicar of Denchworth. He resigned this living on being appointed Provost of the college by the Duke of Wellington, who was then Chancellor of the University.

Charles Conyers Cotton was, for many years, in the Civil Service of India, retiring when he married Miss Egerton, of Oulton Hall. He lived at Knolton Hall, in Cheshire.

Hugh Calveley Cotton worked with his brother Arthur in the Indian Irrigation Works, and eventually had the sole charge of the Kurnool Anicut.

Admiral Francis Vere Cotton retired early from his naval command, and lived during the latter years of his life in Shropshire.

General Frederick Cotton, C.S.I., was the youngest of the brothers, and is the only one now surviving of that large family. He was in the Royal Engineers in India, and assisted his brother in the Tanjore, Godavari, and other works. He was born in 1807, is a retired Major-General, H.E.I.C.S., and received the Companionship of

the Star of India in 1868 for his meritorious service in the Public Works Department. He is ninety-two years of age, and, though suffering from impaired sight, is still mentally alert, proof of which may be seen in an article from his pen in *Blackwood's Magazine* for May, 1900. It is entitled, "Value of the Water of the Great Rivers of India." The good sense with which he deals with this question, and with the prospects of future extension of irrigation, is most marked.[1]

It was an interesting sight to see these brothers together when they happened to meet, as they did occasionally, at some family gathering. They were a noble body of men, handsome, clever, brilliant in conversation; their callings were useful and without a blemish; not one of them had

[1] Much will be found in later chapters concerning the great use to which Indian rivers may be put. On this point the veteran Engineer remarks: "We have an example, set us by some engineer of former ages, which is so to the point of what is wanted at the present day that I must quote it. Quite in the south of the Peninsula there is a river—the Viga, if I remember right—the water of which was so admirably utilized that only in exceptional years did a drop of it reach the sea. The river was dammed here and there, and the channels, leading the water off for irrigation, had tanks to store water for the perfecting of the crop after the freshes ended, which is exactly the principle on which the great rivers should be treated as far as possible. There has been an idea of late that if water is to be stored it will be necessary to find sites for enormous lakes in which to collect it. It is true that the larger the reservoirs are the cheaper the cost of storing water will be. But, if the value of the water is what I hope I have proved it to be, that is not the first consideration. To explain how sites may be formed everywhere, I would ask my readers to look at the Trigonometrical survey map of the Peninsula of India, where they will find that almost any shallow valley is made, by an embankment across it, into a retaining reservoir. These tanks, so called, being dependent upon the local rains, are valueless in seasons of drought, and, in consequence, do nothing to secure the Peninsula from famine. This would not be the case if a stream, led from a never-failing river, ran through the country to supply them. Indeed, our great hydraulic engineer, Sir Arthur Cotton, had a scheme for making such an artificial river to secure the supply of these tanks. But I only call attention to the possibility to show that, as every part of India has its valleys, there is no good reason why water should not be stored on the old native river Viga system in all parts of the country."

a personal enemy, so honourable had been their lives through all the vicissitudes of their different careers. Some of them, however, because of the strength and honesty of their convictions, had very determined opponents, Arthur in particular. But his most inveterate opponent, who, perhaps, was the late Sir George Campbell, K.C.S.I., testified to his great ability and the nobleness of his aims.

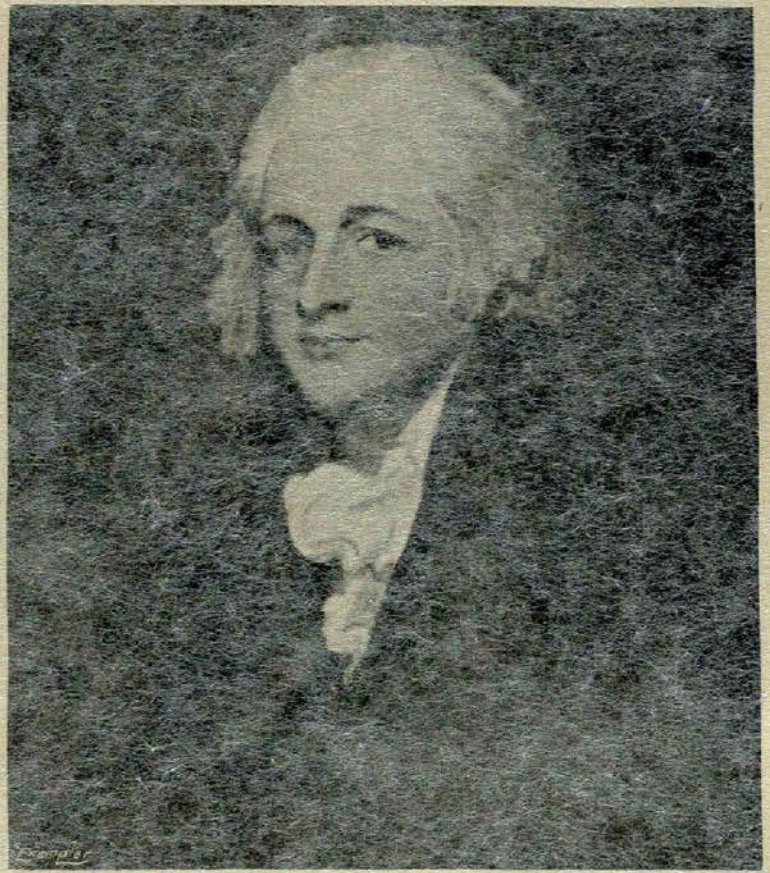
Arthur's early life, as well as his future career, owed much to the careful training and admirable judgment of his mother. Mrs. Calveley Cotton was a very remarkable woman, strong both mentally and physically.

Arthur's bent of mind was curiously shadowed forth in his earliest days in certain traits of character and conduct which were observed by one of his sisters. She and her mother were one day walking in a town with young Arthur by their side, when they remarked on the strange look of the water running in the gutter, wondering what could have given it the colour of blood. Suddenly Arthur disappeared. Hours after the little fellow returned home, having traced to its source the cause of the discoloured stream,—dye works, some distance away. She remembered, too, that often in the nursery he would play with his bread and milk, instead of eating it. When asked the cause of his delay, he replied, "I am making canals."

His brothers, also, remembered that when they were out walking on a rainy day, Arthur would be continually lagging behind, busily tracing small channels in the road with the point of his stick; he would divert the rain-water through the channels, making systems of communication between them.

As an instance of his fearlessness, we are told that, when a boy at school, he had a younger brother (George, one of those who died early) with him, who, unfortunately, incurred the dislike of the head-master, and was bullied and ill-treated in such a way that he was losing both health and spirits, much to Arthur's distress. Finding no means of relief, and having to submit to the rule of the school,

MRS. HENRY CALVELEY COTTON
(Mother of Arthur Cotton).



MR. HENRY CALVELEY COTTON
(Father of Arthur Cotton).

which was that every boy should place his home letters upon the master's desk before despatching them, the elder brother wrote a full account of the grievances to which the younger one was subjected by the cruelty of a master, and described the effect they were having upon him ; this done, he placed the open letter upon the master's desk for inspection. The master read apparently every word of its contents and allowed the letter to be sent, evidently cowed by the boy's decision and firmness of resolution.

At the age of fifteen he obtained a cadetship for India, and joined the military seminary at Addiscombe, near Croydon, where the cadets intended for the Artillery and Engineer service of the East India Company then received their education.

CHAPTER II

Young Manhood—The Beginnings of Great Issues

ARTHUR COTTON was a boy of only sixteen and a half when, towards the end of 1819, he left Addiscombe, after a career marked by much diligence in study and uniform good conduct. Nowadays few careers are begun so early as was his. More than that, when begun, they are not often pursued with assiduity. Life is taken much more easily by the young at the end of the century than it was at the beginning. This is becoming matter of common complaint and is engaging literary attention simultaneously in London and New York at the time these pages are being revised for the printer. "There is no doubt," says one distinguished writer, "that a very large number of young persons are not willing to work hard. They are anxious to do, in return for their pay, just as little as they can." These pages will show that Arthur Cotton's strenuous nature had no sympathy with any disposition of that kind. So well had he worked at Addiscombe, that he obtained an appointment in the Royal Engineers without having to undergo any examination. To him an examination would have been as naught. But the honour of admission without paying a toll was his, and he deserved it. I believe this is the only instance on record of admission into the scientific corps of Royal Engineers being obtained without an examination.

Second-Lieutenant Cotton was stationed at Chatham, but he was not allowed to remain long at the Depôt. In

a short time (on the 31st of January, 1820) he was posted to the Ordnance Survey in Wales. Not unnaturally his early experience was subsequently often in his mind. He was at the most impressionable of ages. His duties took him on foot from place to place, through what was at that time a very wild and lonely country, sparsely populated, and difficult of access on account of the fewness of roads. His surveying tour was successful. He presented an admirable report, covering all the phases of the work entrusted to him, and received high praise for what he had done.

For a year and a half he remained at Chatham, and, in May, 1821, when he was just eighteen, having been appointed to service in India, he embarked for Madras, at which city he arrived in September, after what, for those days, was not a long voyage, extending, as it did, over only four months;—now, the globe may be circled in a little more than half that time. He was attached to the office of the Chief Engineer for the Presidency, and spent nearly a year acquainting himself with the character of the public works he was likely to be called upon to undertake.

In May, 1822, office work came to an end; Lieut. Cotton received the appointment of Assistant to Captain Fullerton, Superintending Engineer of the Tank Department, Southern Division. A most responsible duty was assigned to him, nothing less than the survey of the Paumben Pass, a narrow channel in the causeway of rocks, which forms what is known as Adam's Bridge, between the mainland of India and the island of Ceylon—a bridge of religious and historic importance to Hindus, inasmuch as across it Hanumān, the Monkey-god,[1] led his forces for the conflict with Rāvana and the Rākshasas, which occurred in Ceylon. This was the beginning of a work upon which, at a later date, the young Engineer found useful occupation; the passage now allows of vessels of a few hundred tons

[1] Hanumān himself jumped from India to Ceylon at one bound; his followers found the rocks, which a young Englishman, in after ages, was to remove, useful in following their chief.

passing through. Fifty years after, Sir James Elphinstone, Bart., M.P., made a strenuous effort in the House of Commons to secure imperial funds for the enlarging of the passage to such an extent that ocean-going steamers for Madras and Calcutta and the East Coast ports could reach their destination without passing around Ceylon. Again and again, during the course of the agitation, it seemed as if the work might be taken in hand, but, eventually, the effort was in vain; nothing was accomplished. One notable engineering work still awaits its engineer. Little beyond survey work was done by the young Lieutenant in 1822, as he was recalled to the supervision of tank repairs in the districts of Coimbatore, Madura, Tinnevelly, Trichinopoly, and Tanjore, where was laid the foundation of that complete knowledge of water—its storage and distribution—which was to bear such wonderful fruit there and in other parts of the Presidency.

Lieutenant Cotton soon after proceeded to headquarters, where he remained until 1824. During this time his outdoor work was chiefly in connection with the erection of military buildings at St. Thomas' Mount, a military station a few miles south of Madras.

The first Burmese war was pending, and troops were being drafted from India to the Land of Pagodas. Among those who expressed a desire to join the expedition was Lieutenant Cotton, who, then only twenty, proceeded to the front. He was associated for some time with the gunboats, reconnoitring, fighting, and eventually with the storming of the fortresses of Mergui and Tavoy. He was engaged in defending Rangoon, and afterwards took part in the assault on the stockades of Kakien. Here he distinguished himself by taking the lead, as the only engineer officer with one of the columns of the main army. He led the storming party against seven forts and stockades; he served also in the trenches, and was engaged in all the most notable actions of that time.

One of these exploits is thus described in his own words:—

LIEUTENANT ARTHUR COTTON, R.E. *p.* 16.

"The place taken was Mergui, the southern fort of the coast of Tenasserim, in Burma, not far from the north of Penang. The force was detached from Rangoon about August 24, and sailed direct to Tavoy, in the centre of the coast of Tenasserim, which surrendered, and we then sailed to Mergui, which is beautifully situated on rising ground some miles up the river, where there is good anchorage for ships. One face of the fort is on the river bank, with batteries which were silenced by the men-of-war, while the transports were at anchor half a mile below. The west face of the fort was built, on a line perpendicular to the river, of solid teak timber twelve or fifteen feet high, and had a gate about a quarter of a mile from the river. The force was landed near the shipping, and, according to the utter want of anything like military order usual at that time, the men—soldiers, sepoys, and pioneers—all rushed up to the gate without any arrangement.

"When we reached the gate, exposed to the fire from some flankers, I found there was only one ladder at the spot, which I planted beside the gate, and looked round for others, when a young officer of the 60th called to two or three officers and men by name to follow him, and leading them in—all four—he dropped down on the inside, cut off from all possible help. I looked for more ladders, and was planting a second against the gate, when it was opened by our fine fellow inside, and we rushed in, and carried the whole place in half an hour, capturing the Governor.

"All this without a single order from the officer in command, and if we had not had the most contemptible enemy in the world, we should at least have suffered terrible loss. As it was, our loss was only thirty or forty men.

"The splendid young officer who led, and who would now, of course, have been a V.C., was never mentioned; nor do I believe the staff officer, who wrote the report, knew what had happened, for he was not at the gate, I think. This is a specimen of the whole war. Nobody could now believe the way in which things were then done. Every loss we suffered was solely from the want of any

sort of preparation or military arrangement. The Burmese are the greatest cowards in the world, and had not an idea of stratagem. They never thought of fighting us in the open. When the Governor of Tavoy, who was on board one of our vessels, saw the men rush up to the fort, as if it were play, he threw down the telescope, saying, 'If that's the way you fight, who can stand before you?' Then he went and hid himself in his cabin."

It will be readily realized that if in actual fighting such loose arrangements prevailed, in commissariat and general control of supplies the defects would be very bad. They were bad indeed. Great hardships were suffered by all the force. Not only were the provisions scant in quantity, but they were exceedingly bad in quality. The sick in hospital died by hundreds owing to the want of suitable food.

My father, even after a lapse of so many years, retained detailed memories of those days of peril. He used to tell us that once he was with a small party of men every one of whom was shot down except himself. Several officers, who were his contemporaries, have told us how one day, when the fight was at its hottest, he was seen alone leading a troop of men into the thick of the battle, cheering them on, and cutting his way through the enemy's flank as he went.

It was whilst stationed in Burma that he acquired a dislike to card-playing, a dislike which lasted all his life. He was invited by one of the principal officers to dine with him. This officer was a man of high standing in the army, and much looked up to by the younger men. After dinner Lieutenant Cotton was asked to play. Although he had been well accustomed to the card table in his parent's home in Cheshire, he had never played for money, but being a very youthful subaltern he accepted this invitation as a command, and thought it his duty to play. The more he played, the more deeply he lost, and when he rose from the table he was a poorer man by twenty pounds. His pay was very small, but he had in his possession bank-notes of that exact value, sent to him by his father in a

recent letter, that he might purchase some necessaries which otherwise he would have wanted—and wanted in vain. For the moment he could hardly realize the fact that every penny of his money had now to be handed over to his superior officer; however, so it was. Needing the money very badly, he greatly regretted this loss. But he had lost. He might have refused to play, but having consented to take a hand, he had no resource save to part with the much cherished bank-notes, and, of course, he paid. However, he had learned his lesson, and vowed that, so long as he lived, he would never play cards again. This resolution was a lasting one; he could never bear the sight of cards in the house, and never allowed his children to play with them.

Lieutenant Cotton returned to Madras after the Burmese campaign was ended. During the voyage, while sitting on the deck of the ship one evening, admiring the sea and the sky illuminated with stars, the thought struck him forcibly: "Who made these worlds? Upon whose handiwork am I gazing now? It is the work of God, the great Creator." He had never been what is called a religious man, and had never specially studied his Bible. This thought so impressed him that it brought naturally with it the practical enquiry: "If there be a great Creator, if He made the world, the sun, the moon, and the stars, what do I know of Him? Has He ever spoken? If so, what are His words? The Bible is the Word of God. I ought to read it; I should like to know what He says."

There and then, on the impulse of the moment, he went into the saloon where the ship's officers and some of the passengers were playing cards. As he entered, he asked the question: "Is there a Bible on board the ship?"

A loud shout of laughter greeted this question; he was asked if he were going to turn religious. However, on again making his request, it was suggested that some one present possessed a Bible, which was packed in the bottom of his box. It was brought and handed over to him. It may be said, from that hour until the last day of his life,

his chief delight was in the study of the Scriptures. He pored over the Bible that was lent him; the rest of the voyage was full of the deepest interest, as he drank in its new life-giving truth, new and precious to him.

The result of this experience, and the change that now took place in his life and thoughts, were in no sense transient. His future career was in every way influenced by it; his hours, both of toil and pleasure, were marked by a sense of the presence of the Unseen Saviour. His whole nature was characterized by devotion to his Bible, which he always spoke of as "The Word of God," to the teachings of which everything must be subordinated. His motives, pursuits, and interests were all coloured by his prevailing study.

On reporting himself, after arrival in Madras, Lieutenant Cotton was appointed to act as Superintendent Engineer, Central Division, Tank Department. Early in the following year he was confirmed in the appointment. His duties were of the same character as those he performed before he proceeded to Burma, the inspection and repair of Irrigation Works, but now with more of personal responsibility than before. The arduous nature of the work, towards the end of 1827, led to a breakdown of health in the shape of an attack of jungle fever and inflammation of the lungs; short leave to the Neilgherries, the chief mountain range in Southern India, was granted. Leave over and health restored, the young Engineer was ordered to the Paumben Pass to make a thorough survey of it, and to commence trifling improvements. Work was really begun, but only in a tentative way. A mere pittance of £300 to £400 was granted, but with this small sum the worst obstacles in the channel were removed and the Pass deepened two or three feet.

After eight years' service, he was promoted to the rank of Captain. Then opportunity offered for the beginning of one of the great works which will, through all time, be associated with the name of Arthur Cotton. He was appointed to the separate charge of the Cauveri Irriga-

tion, which formed part of the Southern Division, with oversight and responsibility in regard to the Paumben works. Special study was given to the needs of the Tanjore district, and the moods of the Coleroon River were regarded in almost every possible light, with the view of making that great stream of the utmost possible service. The need for wide-reaching works was exceptionally great. Absolute ruin stared Tanjore and the adjoining districts in the face. "Since the completion of the scheme they are reckoned the richest parts of the Presidency, and Tanjore returns the largest revenue [of any district] in the Empire. Land under the silt-charged waters of the Kistna yields at the most Rs. 8 per acre, while in Tanjore the State often receives twice as much." [1]

Plans for the earlier works were evolved and received sanction. They were the product of 1828 and 1829, and on the first of January, 1830, the great work was begun by Lieutenant Fred. Cotton, younger brother of the Superintending Engineer, cutting through the Grand Anicut to construct the sluices. Having got the work started Captain Cotton had perforce to surrender to repeated attacks of jungle fever, and obtained sick leave to Europe, delivering over charge during January, 1830. He was away from his sphere of labour for two and a half years, twelve months of which were spent on the return journey.[2]

When he returned to England life had a new aspect for him; he saw everything in a fresh light. Hunting, card-playing, dancing, and other amusements and recreations, which formed a great portion of the interests of those among whom he spent his leisure time, were distasteful to him. He used often to describe what he felt when asked to join in these amusements, the hollowness of such a life, the way in which it pained him to see reasonable men and women thus employing their time; and I have heard some of his relatives describe him as

[1] *Irrigated India*, p. 158, by the Hon. A. Deakin.
[2] See Chapter iii.; "Sir Arthur Cotton as a Traveller."

sitting thoughtfully and quietly in one corner of the room while the others were engaged in various ways. The fact was, that he was seeking the Higher Life; he longed to know more of the true foundations of belief; he wanted to consecrate his energies to the Lord Who had so manifested Himself to his heart; his sole enquiry was: "How shall I live my life for Him? What shall I do for His glory and for the benefit of men?"

These questions he felt could not be answered amidst the county society in which he was then living. So, making his own choice, as usual, he went to a village in Oxfordshire, where one of his brothers, an earnest and devoted Christian, was a clergyman of the Church of England and a devoted student of Scripture. There my father remained for a time, helping him in his parish work.

So strongly had Captain Cotton impressed himself and his views in regard to the Cauveri upon the authorities that, despite his prolonged leave, his position was kept open for him, and he resumed charge in the autumn of 1832. The energy with which he threw himself into his duties may be judged from the fact that he had his completed project for the two Coleroon anicuts before the Government and sanction obtained in time for the preliminary works to be finished before the monsoon freshes in June occurred. What the work of the next half-dozen years really meant—alike to the district in which the Superintendent Engineer served and to his own reputation—requires separate treatment. It may suffice to state that prolonged and devoted toil brought about another breakdown in health. Complete change was again necessary, and, mindful of all the pleasure and strength he derived from a southern clime, Captain Cotton turned his steps towards Tasmania.[1] His visit on this occasion was destined to have important consequences upon the whole of his after life; there he was to find the partner of his

[1] The Service Rules at that time prevented his going again to England, and his choice lay between South Africa and Australia.

remaining days, the true, the loving, the cherished, companion in every scene through which he subsequently passed.

Captain Cotton was again in Hobart Town. One day as he was walking with his host, Captain Beecher, they saw a young lady coming towards them. Captain Beecher said to him: "Now I am going to introduce you to a girl whom I should really like you to know." He then told him of the self-denying, earnest, Christian life of his young friend, what a blessing she was in her own home, and how devoted and kind to the sick and poor living in the outskirts of the town. At this moment she came up to them: Captain Cotton was introduced, and he there and then made up his mind "if God would give him so great a gift, he would marry that girl." The young lady was Miss Elizabeth Learmonth, the daughter of Thomas Learmonth, Esq., a gentleman who had become a large landed proprietor in Australia, but who was at that time living with his family in Tasmania.

Her gentle smile and attractive manner won his heart at once; they met day after day. She found in him just what her heart needed—a wise, Christian, sympathising friend, who could help her in every way she desired.

After this, the accident described on pp. 38–39 made additional sick leave necessary, as Captain Cotton's health had been much impaired; he had to spend another year in the colony. Before the end of that time he and Miss Learmonth were engaged. The state of his health was the only objection in the mind of her parents to their union; of this they said, quite gravely: "To all appearance he won't live two years." Over these fears they often laughed in after life, especially when the day for keeping their golden wedding drew near.

So he returned to Madras alone, but only for a short time, the doctors saying that a longer rest and stay in the fine climate of Tasmania was necessary for him. October, 1841, saw him again in the island, and the marriage took place on the 29th of that month.

After another year and a half, spent in Tasmania, Captain and Mrs. Cotton returned to India, their voyaging made happier by the presence of a little daughter, two months old.

Two extracts from letters, written by him at this time, may be made. One gives Captain Cotton's ideas about books suitable for a Christian's reading.

"I wish," writes Captain Cotton, "to remind you of one thing, that it would be well, so far as you can judge or ascertain, for you to read none but first-rate books: I mention this, as it may not perhaps occur to you. If we were led into a treasury, and told to help ourselves, why should we fill our pockets with silver, when there was a heap of gold by its side? 'Take unto you the whole armour' (Eph. vi. 13). Naturally we seek for all sorts of things to arm ourselves with: the favour of great men, health, shutting our eyes to the light—anything but the armour of God—things which, so far from being armour themselves, are so vain that no armour can preserve them; nothing but the armour of God—that to which we are directed in His Word—can stand in the evil day. Let us hear what it is—'Having your loins girt about with truth.' The first thing that is done in hot climates, to prepare for great fatigues, is to wind something round the body to support it; for strength is the first thing required."

Again, to the same correspondent:—

"We arrived here (in Tasmania) without trouble; and found a home ready provided for us, with everything we could want. We can remain in this house for some time, and have almost arranged to take a little farm of Mr. D——'s, adjoining the Parsonage. It has a small cottage on it, is capable of irrigation, and has nearly every qualification that I wanted. I believe we shall be able to take possession of it at once, and as I have one engine already complete and put together, I can at once begin to irrigate. There is a garden in full cultivation with fruit trees."

There the first year of the married life of my parents

was spent in great happiness. My narrative will now go back to incidents, some of which happened prior to my father's marriage,—his various voyages and journeys, all of which I have gathered into one chapter.

CHAPTER III

Arthur Cotton as a Traveller

SEVENTY years ago it was possible to take things more leisurely than is now conceivable. Those were unhurried days; such days are never likely to return. My father's health was re-established by the rest and recreation he found in England; he was eager once more to be at work. Yet he could calmly contemplate an overland journey to India, which differed vastly from the two days' rapid run from London to Brindisi, and water journeying all the rest of the way. Our traveller zig-zagged through France and Switzerland, visited the Holy Land, crossed the Syrian desert with an Arab caravan, sojourned in Persia and at Bagdad, and made some of the most lasting and valued friendships of his life. He has left on record, in a number of letters to his relatives, entertaining glimpses of his travel-experiences. In the altered circumstances of travelling to-day they are of special interest.

Arthur's first letter was from Namur, reached by way of Ostend. He had proceeded thence to Bruges by the broad canal, handsomely bordered with trees and kept in beautiful order, in a boat extremely well fitted up. This is a mode of travel now unknown. Yet it had many charms. But for such an easy and quiet manner of journeying it is probable that Robert Browning could not have taken his ailing bride to sunny Italy and a new lease of life. From Bruges, my father travelled to

Ghent and Brussels, crossing and inspecting the field of Waterloo, on which he remarks with characteristic acumen :—

"With the help of a book we had with us we made out the site of the battle perfectly. It appeared to me the finest piece of ground for a general action that could be imagined; there was sufficient variety of level to show clearly the state of the field throughout, and at the same time not so much broken as to prevent any army from being used with full effect."

From Geneva to Lyons and other regions, and so by way of Avignon to Marseilles, he leisurely proceeded. Much of the country was of a dreary character, rocky and barren, and reminded him vividly of the worst parts of India.

"A very stony, bare, country with many low, rocky, hills quite destitute of vegetation, and several of them with old fortifications on them, like the very small Polygar forts in the Carnatic. If it had had the advantage of a few clumps of trees near the villages it would have been exactly like the worst parts of Coimbatore and Mysore." The advantage apparently was with the Indian scenery.

When at Marseilles he was told of the quarantine harbour formed by a breakwater uniting two islands five miles from the coast. He was not able to visit this work, though anxious to do so; ever on the watch for that which would help him in India, he wanted to see the breakwater so as to obtain a "hint with respect to the Madras Roads." His mind, it will be seen, was already anticipating the project, which he afterwards initiated, of a breakwater at Madras.

Society at Alexandria he found to be "an odd mixture of English, French, Italians, and various compounds of these people, with Greeks, Syrians, and others, some sitting on their heels, some on the ground, and some on their proper points of support; all the males had pipes or cigars in their mouths, and some had large beards, and wore the Arab dress." "It makes me quite sick," he adds,

"to see Englishmen and Christians ashamed of their own dress and customs." The town, miserable place as it was then, had, however, "many beauties in his eyes, for everything looked like India."

From Alexandria he proceeded, again by canal, to the Nile; thence to Cairo, after a voyage of one hundred and twenty-five miles in six days. The Nile, he says, was "nearly full, and level with the surface of the country, which has a fine effect, but, in point of size, the river is nothing, not more than from three hundred to seven hundred yards broad, and the other branch is much smaller." Still comparing everything with the standard of India, he remarks: "Englishmen here are nearly in the same circumstances as in India; the Pasha treats them as well as possible, and, in general, all in authority do the same."

Of the Pyramids he expresses the disappointment so frequently felt as to their apparent diminutiveness. There is nothing with which to compare them. "There is," he remarks, "no high ground in their neighbourhood, so that they stand 'quite independent,' as C—— would observe. I could not, except once or twice for a moment, perceive that they were above thirty or forty feet high. The illusion is so complete and so extraordinary that, though I had heard of it, both respecting the Pyramids and also other stupendous objects of a similar kind, I could not have imagined it possible unless I had experienced it myself."

I was travelling in Egypt, in 1894, when my mother wrote: "Your letter of March 8 came this morning—such a treat to us both. Your father has such lovely, delightful, recollections of desert air and desert life, although his travels were not made under such comfortable circumstances as yours. He had no opportunity either of seeing the wonders you are seeing, having to keep with his caravan."

Arthur Cotton returned through the Nile delta to Alexandria. He carefully examined the system of irri-