

her, tossed about more than twenty feet above our heads, like a nutshell, among pieces of ice twenty times her own weight, and sustain so little damage. The crew soon got her safe on the land, and we succeeded in saving nearly all the gear."

It is fortunate, perhaps, the crew were absent; some attempt to interfere with Nature might have caused loss of life or severe injury. Mr. Loney's sextant was severely injured, indeed ruined, the arc being twisted. This dose is one of the prevailing liabilities to boats and ships.

At eight A.M. on the 11th they left the south shore in the two boats, and reached Barrow Island about four P.M., both boats rather leaky. To us Barrow Island, viewed on all sides, appeared to rise rather abruptly on the low land, but Richards describes it as so smooth as to render it difficult to determine its apex, much resembling the back of a turtle. This is a deceptive point to determine, to any but a practised eye, on any very extensive swell of land. A cairn was built, and at six A.M. on the morning of the 12th of July they pushed forward, landed on Spit Island, saw the ship, and came on, reaching our floe as before stated, and bringing despatches from Captain Kellett, at Melville Island, in thirty-five days.

CHAPTER III.

Run of the Ice.—Driven aground.—Barrier Limits.—Crystal Palace.—Reflections on Nature's Gifts.—Tidal Effects on Ship.—Last View of the Sun.—Ice lifting the Ship.—Visit of a Wolf.—Inauguration of Crystal Palace.—Frost-bites.—Increased Comfort.—Peculiar Coincidence of Temperature.—Coast-line Figures.—Freezing beneath the Floe.—State of the Crews.—Christmas Day.—Thermometers inserted in the Snow.—Effect of Wind on Snow.

THE excitement and duties attending our late flow of events has almost withdrawn our attention from our merciful escape,—not forgotten, indeed, but clouded by anticipation of the eventful future. We are indeed to be compared to the unfledged young of the tern, born and left upon the rock at the termination of the season, to perish, unless "He who all protects" extends his shield over us. Day by day events confuse all our fine-spun theories, and we find ourselves again cast upon our backs. On this, the 20th of October, and late in the season, we are as much bereft of any rational feeling of security, as in August last. Such may be our case in the November gale!

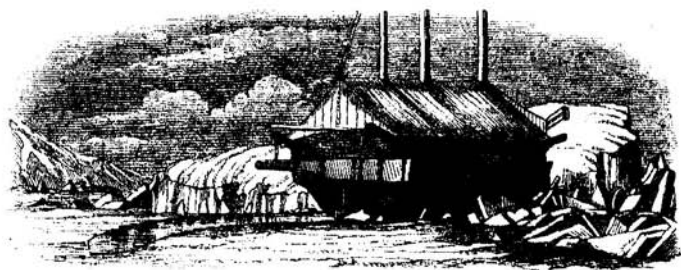
Hardly had these observations been penned, when that peculiar unmusical sound resulting from squeezing

ice, by some termed "cat agony," not much unlike the wet finger over a plate of glass, added to an unmistakable roar of moving gravel on the beach,—intimated one of Nature's movements. Oh that pen or pencil could portray on paper the extraordinary sensations, or the sublimity of the changes in but a few short hours! even minutes might have determined our fate, but it was not "His will."

The scene I will endeavour, but I fear very inadequately, to describe. I had gone on deck to witness, as I imagined, simply one of Nature's freaks, and foreseeing possible mischief, determined to aid in turning to advantage what must otherwise inevitably result in disaster. It was an exhibition—a period of command never to be erased from my memory; we were, nevertheless, in imminent danger. The outer floe was in action, pressing heavily on the shore. The newly-formed outer ice was buckling, piling, and threatening to overwhelm all within. Unless the ship could be withdrawn, and that by an inclination away from the grounded ice, she must be overwhelmed or driven ashore in such a position as to leave her subject to be rolled over on her broadside.

The hands being at their stations, a canal was most expeditiously cut with a long radial curve, coaxing, much in the same manner as in railway practice, her motion off the nearest mass of ice. I clearly foresaw that the instant her bow became pressed, the ship, acting on the ice astern, would force it under the smooth surface, and gradually help herself to a new dock. Causing our men to depress the inner pointed end, the force commenced; cable was veered, and beautifully did she glide into her

new berth, doing all the work herself, as if it had been an every-day evolution! Not an inch was there to spare. She had, it is true, imbedded her sternpost, and risen abaft about fifteen inches: the piling ice had ceased at her bow, and the cable was taut. But who shall describe the chaos without? Horrible! worse than the old nightmare floe which had been blown off. Such was



our position; and the 'Pioneer' also grounded when the movement ceased, and left us to view the effects of the external forces from which we had escaped.

Our position before this catastrophe seemed to promise not only comfort, but also security. Both within, as well as without, a fine glassy level sheet of nine-inch ice had formed up to the very beach, causing us to congratulate ourselves on the smooth travelling it would afford to our spring parties. Over this extensive white sheet but a few masses (apparently berg pieces) of ice here and there dotted the surface, and afforded safe barriers, as we had anticipated, from any pressure from without. When ice has once formed to such thickness, it is seldom that we notice more than partial disruption, and that in lines or "rips." But in the present case it was

ordained that we should witness the effect of one of Nature's sullen, certainly not silent, motions.

The first notice we had of this action was a rushing noise, caused by the displacement of the small stones at the beach and the forcing slab over slab, to perhaps twenty thicknesses. This merely broke the ice directly in contact with the coast-line. But to seaward all was confusion; slabs were turned over, forced erect, and jumbled together with quiet but appalling grandeur, each motion causing inquiry if that which you stood upon might not instantly turn upon and annihilate you!

Nature seemed to have lined out its action, and determined "Thus far shalt thou come, and no further." But the exterior ice, enraged, as it were, that it could not reach us, trembling as we might be supposed to be like mice in a trap, vented its spleen on the barriers aground, piling slab on slab until all was one chaotic confused outline, but barring us within a clear radius of two hundred yards from the shore astern of the ship, until at length it became, by its own accumulation, grounded.

This outer barrier I should imagine to be composed of plates of bay-ice, varying from nine inches to a foot in thickness, and even when grounded, raised above the mean level about twelve feet, forming a natural rampart, including the 'Assistance' and 'Pioneer' within its bounds, with a still smooth carpet up to the shore! Notwithstanding, all within was calm; and this, our second deliverance, seemed to warrant security; still, the conflicting roar of the outer ice, and the squeezing up to our bows and no further, continued to harass us much, as it kept all hands on the alert, and did not afford us relief from anxiety night or day.

We were now aground : what the next motion might effect we could only await in patience ; all that human power could avail had reached its limit. In the general feeling each man thinks of himself, the Captain has to think for all ; what his feelings were it is needless to describe, but the means of future security were, in his mind, uppermost. Our changes of late left us cause for gratitude and ground for hope ; we were now safe from drowning.

Before this *bouleversement* the beach offered nothing but finely comminuted stones and but very little snow, —nothing indeed adapted for building. As a few hours more might compel us to seek for refuge on the shore, I landed to examine for materials. Before me Nature had, by this late act, provided amply for our necessities ; the slabs of ice, all of nine inches in thickness and of every required surface, were thickly strewed at my feet. I determined instantly on the construction of a Crystal Palace, perhaps to live, like its predecessor, in history ! The officers were summoned, the ground lines marked out, navvies sinking the foundations, moulds made, blocks sawn out, and the first house in Victoria Town well in progress before we retired to rest ; its dimensions were eighty feet in length by twenty feet in width, its walls eighteen inches in thickness. The cement being formed of wet snow at a temperature of -6° , soon reduced the work to solidity, and, in justice to the builders, I must say that their work was as accurate as if Her Majesty had intended to inspect it in person ; each ice-brick is cut by hand or cross-cut saws, and the building presents a very substantial appearance. The Crystal

Palace, of which I had long joked, now rose in real grandeur, under the principal superintendence of Commander Richards, aided by our trusty Boatswain,—the essence of any work to be done; always ready, master of every trade, and of an extraordinary even temper. Verily, sailors are wonderful animals!

But, amid all this mixture of fun and seriousness, for both had their alternations, can the philosophic mind fail to perceive the merciful dispensation of Providence pervading all around us? The peculiar bed, of soft plastic clay, on which the ship is grounded; the crescent of huge masses of ice grounded and cemented together, forming an outer arc constituting the present piled rampart of broken ice, momentarily increasing, and thus shielding us more effectually from further danger; and last, but not least important, the smooth, unbroken carpet within, on which we may have yet to convey our provisions to the shore, possibly to our future domicile! The terraced land itself, hitherto our unpromising surface, already smoothed and prepared for our convenience, not forgetting too the upheaved, cast-on-shore slabs of ice, without which we should have been reduced to the stores saved from the wreck. Wonderful indeed to the contemplative mind are all these matters, and all their adaptations to the ends of science. Shall it be again inquired, "What is the use of science?" Without it, all the gifts of Nature, their application, beauty, and gratitude for their enjoyment, would cease to exist! Throughout our progress we cannot but maintain, wonderful have been our pursuits, our escapes, preservation in health, etc.; these last are but a continuation of the blessings we have enjoyed.

October 23, Sunday.—At present it is calm ! Another run of the ice towards the shore must decide the fate of these vessels ; it may lift us quietly up, and leave us aground. It is our day of rest, and Nature herself seems disposed to permit of its enjoyment.

October 24.—Feverish, restless gusts from south to west still continue to tantalize us. We continue landing provision, to be prepared for the worst, as well as fuel and other necessities ; but, in my own mind, I begin to think we have seen the worst.

November 1.—The month of October has terminated, but still I regret to say that a dreary uncertainty seems to hang over us. The temperatures have continued high, and consequently the ice has but now attained one foot in thickness. Our principal changes seem to occur in these latitudes more at the first and last quarters of the moon, but this morning, at low water of the new, we experienced a slight shock ; but, as I had long suspected the cause, it did not surprise me. It was occasioned by the falling away of the ice from the sides, on the keel taking her whole weight on the ground. This I expect to be repeated, until having at each grounding interposed a fresh layer of water when the ice detaches itself, she will gradually become lifted, and eventually completely ice-borne, free from the ground.

Our old enemy, the external floe, has been in motion during the week, and opened a space of water about half a mile outside of us, but it has again become frozen. The Crystal Palace progresses rapidly, being at present five feet above the level, very firm, and promises to afford substantial shelter. The windows, constructed of one

single plate, have been specially refrozen on a neighbouring lake for this purpose, fresh water affording more brilliant and transparent ice: they measure three feet by two, and are four inches in thickness. In this particular we beat the Crystal Palace, as we can have them of any size "to order," and without additional expense!

The sun should be asleep, but his rays continue to illumine a considerable arch of the horizon, and his countenance was so far refracted yesterday as to be seen from the maintop. About 40° to the westward of the meridian, or of his position, a luminous prismatic tinted mass of light appeared to represent one of his parhelia, the other was obscured by intervening land. The temperature ranges at present between $+10^{\circ}$ and -18° .

November 5.—Experiments were attempted last season on the rate of freezing of the sea, or positive increase of floe-ice: but as they were not satisfactory, and moreover so much at variance with any probable facts, I determined to repeat them this season under proper inspection, and to continue them up to the time of thaw in spring.

In order to secure the entire range, a smooth place on the floe was selected, and an open parallel gauge inserted, which would not be extricated until the end of the season. All measurements were to be made in radii near this centre. This gauge was formed by a square tube, open on two sides, and inserted five feet six inches beneath and eighteen inches above the floe, the thickness of the ice at the moment of insertion being eighteen inches.

The arrangements on board for maintaining a more

equable, dry, and satisfactory temperature have been completely arrested, until winter places our fate undeniably in our own hands; as until the ship is beyond doubt "frozen in" we are unable to secure the hatchways. As far as present experience affords a test, all our experiments have so far proved satisfactory, that we experience a much purer air below, less condensation of vapour, and more general comfort; but until the outer cold air can be entirely cut off, the plan is incomplete. At present no less than 12° difference of temperature is apparent between the external temperature and that on the quarter-deck, the former being -6° , and the latter $+6^{\circ}$.

It is strange, however, that even with thermometer proof, some will obstinately cling to "former cruises" and impressions, even in questions where health and life are hazarded.

According to my notions of Arctic visitations, I anticipated the first notice of intense, or winter, cold between the 6th and 10th of November, or by last season between the 5th and 12th. Yesterday, the 6th, it fell as low as -12.5° , but rose again on the noon following to -6° .

The observations as to the lifting of the ship have been completely realized. A batten nailed to the stern-post indicates at present an elevation above the previous ice level of eighteen inches at the stern, or a depression at the bow nearly equal to two feet on her true line of floatation: and this difference of level has, I suspect, aided Sylvester's warming apparatus to work more to my annoyance, as well as that of the officers; not by warm air, but conveying to the after-cabins the nauseous perfumes of the boiled cabbage, tobacco-smoke, etc., from the

lower deck. I cannot imagine that any seaman would sail his ship two feet by the bows, on the chances of deriving benefit from his warm air apparatus.

Quitting this subject, and turning my thoughts seriously to this fact of uplifting, the natural question arises, For what purpose is this interference of Nature? Has it any connection with our safety? Will it tend to our destruction or preservation? Most undoubtedly, on scientific reasoning, it must conduce to the latter: each succeeding lift will aid in taking her keel out of the clayey bottom, and should another "run of the ice" recur, merely pass her higher up, leaving her keel unhurt. To those far distant the natural impression would induce the belief that for the winter we might consider ourselves free from further disturbance. But the Americans we know experienced drift of the main pack in Wellington Channel late in December, and beyond Lancaster Sound during the whole winter. We know full well that about the 9th of November we have to expect one of our strongest gales; and bearing in mind that "forearmed is forewarned," all our preparations must be continued to meet the worst.

Our Crystal Palace is far advanced, glazed, and merely awaits the roofing. A smaller house for magnetic and astronomical purposes has also been completed, and a very convenient copper stove and piping will render it comfortable. The entire buildings present from the ship rather a formidable appearance; the Palace, with its windows, resembling casemated embrasures, and the Observatory a flanking bastion.

Eventually, should it not be the will of Providence to

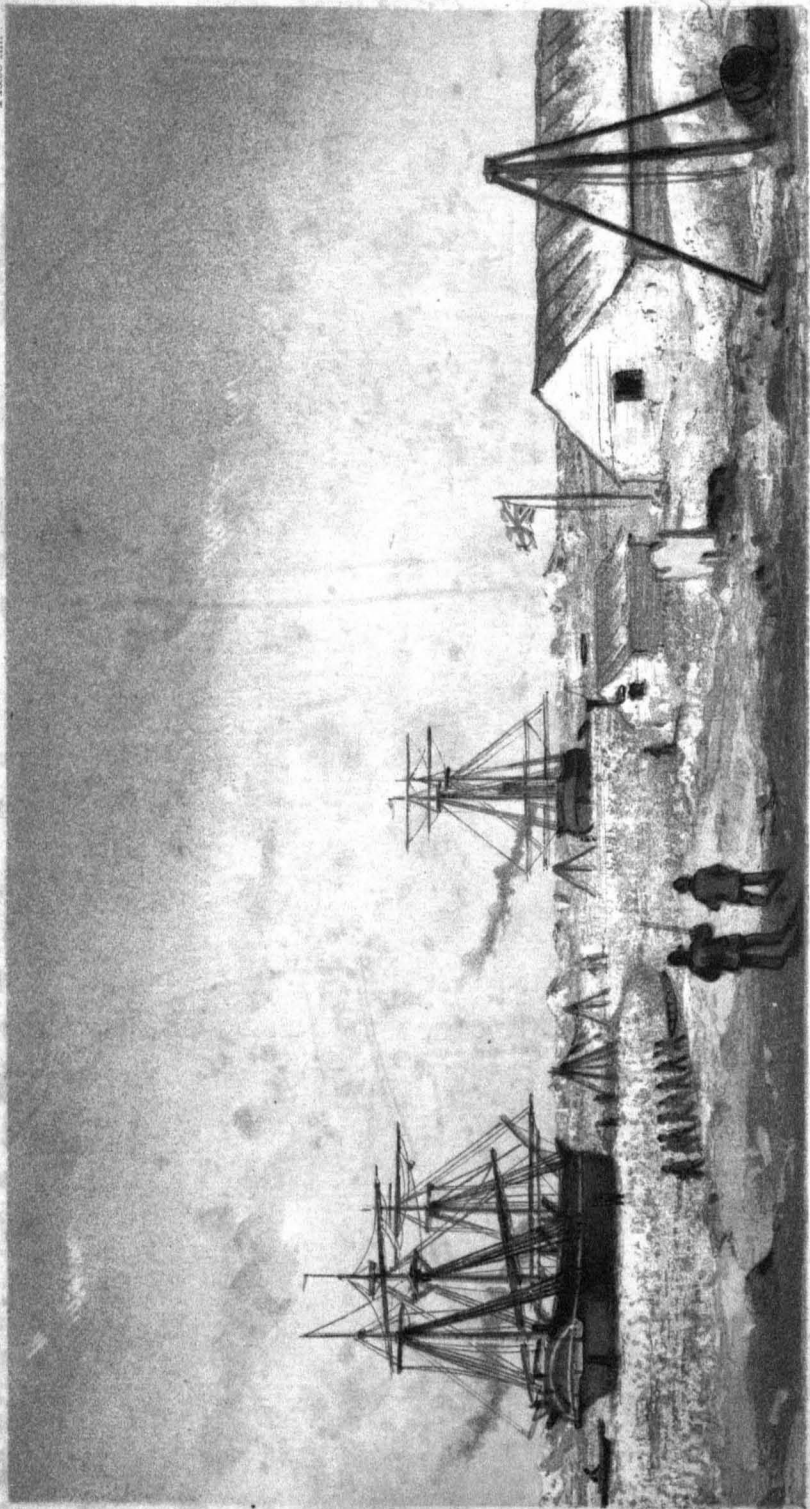
force us to seek its shelter, it will afford an admirable retreat for healthy exercise and amusement, possibly for the seamen's theatricals. The latter did not take so well as expected last season with the officers; indeed, most of them were of a more serious turn, and I cannot observe any chance of their resuscitation. For myself I did not enter into the spirit of or admire them much, and to make a man *malgré lui* render himself ridiculous by failure, is little less than a miserable attempt at buffoonery; such, too, I believe to be the prevailing opinion. Nevertheless, even to kill time, I shall use my best endeavours to promote them, should our "indefatigable proprietor" intimate any such disposition, particularly on the part of the seamen. The mere act of learning their parts frequently inculcates some moral which may prove the keystone to future development of abilities.

November 7.—This morning the officer of the watch, Mr. Pim, on his visit at two A.M. to the external thermometer under the stern, noticed, as he imagined, a strange and taller dog than any belonging to our establishment, and not liking his appearance, returned on board to assure himself of their presence. This satisfied him that the visitor was no less than a wolf: not at all a pleasant companion at that early hour, and unarmed. These matters seldom lose by telling, and the version first promulgated was, that Pim was about to pat him, when he discovered his mistake: but his own version I prefer:—"he did not approach nearer than ten yards; the weather was thick and sleety, and he did not feel the slightest inclination to fraternize." Was this our mysterious wolf from Arthur's Strait?

In addition to the rate of the freezing of the sea, we commenced the construction of another snow-bank, for further trials on the immersion of thermometers; a tube was also inserted four feet beneath the gravel, for a similar purpose; but as ice invariably presents itself at ten inches beneath the surface, this can only after all be deemed as inserted in ice. All these experiments are however dependent for their commencement on the rise of the thermometer to zero.

Our thermometric comparisons for this season have, owing to our insecurity and chances of destruction to the instruments, been confined to the floe, and, in order to avoid any influence from the ship, they have been fitted in a small boat, inverted and suspended from the driver-boom astern of the ship, their bulbs being five feet above the present upper level of the ice. In addition to this, at six feet from the ship's stern, very substantial snow-walls of eighteen inches' thickness are also interposed. This leaves them fully exposed from our prevailing winds, or from east round by the south to south-west.

November 9.—Today the temperature fell as low as -33° , and this being below that experienced about this date last season, tends to verify my theory as to our first visitation of winter occurring between the 1st and 10th of November. But, notwithstanding the barometer continues to fall gradually, we have not as yet any notice of our annual gale. The Crystal Palace being complete, and flag-staff erected; on this the natal day of His Royal Highness the Heir Apparent, the national colours were displayed, the crews assembled, the healths of our Gracious Queen, the Prince and Royal Family drunk, and



F.M. Douglas del.

Crystal Palace Winter Quarters 1853-4.

Vincent Brooks's lith.

the Palace duly christened "Albert House, of Victoria Town," with three times three hearty cheers. The Observatory also obtained the honour of "Cornwall Lodge." This concluded the ceremony, except that which was perhaps almost as acceptable to the spirited builders,—the repetition of the toast at their warm meal in Allsopp's universally applauded "best."

Out of good evil will oft arise : and thus it happened to some of our zealous and loyal party, who had incautiously ventured direct from their warm quarters to participate in this important ceremony, exchanging a temperature of 60° to -23° , = 83° of cold. This immediately touched fingers and noses, rendering them of that peculiar deadly white known as frost-bite. This affliction has long afforded the old Arctics the privilege of taking their friends by the nose, in order to restore animation. But it has now lapsed into the simple application of the back of the warm hand, as the more inoffensive and approved mode of conveying kind attention.

Our gale, although not felt by us under the protection of the land within us, evidently blows strong aloft, the temperature rising to -14° , and the scud aloft flying rapidly from the south-south-east. On the 11th of November it had increased considerably, but still aloft, raising the temperature to -6° ; but the whistling of the breeze, added to the rattling of the frozen ropes about our mastheads and mizentopmast, afforded music sufficiently discordant to materially interfere with pleasant dreams. The dryness, as well as lightness, of the ship renders her almost as sonorous as a musical instrument; and the sounds resulting from pacing the deck, or even

the floe cracking near the ship's sides, are far from aiding our slumbers, which on this second winter we find somewhat impaired. In addition to this, the appetite is almost wanting, wine is not appreciated, and it would require infinite labour to afford even Monsieur Soyer definite instructions as to what would be palatable. Yet eat and drink we must, in order to sustain nature, and prevent our falling so far behind as to render recovery of strength even doubtful.

November 20.—I shall now recur to our fitting for winter, warming operations, etc. The system, in so far as our experience affords a drier condition of the lower deck, appears to answer completely, considering the restricted means at our command. But our experiments with imperfect fittings remind me much of a leaky ship, the air in the present instance forcing its way in by every unstopped crevice. However, such as our success has been, may easily be derived from the following. The nearest approach to our present temperature occurred about the 14th of December last season.

| | Dec. 14, 1852. | Nov. 9, 1853. | Difference. |
|-------------------|----------------|---------------|-------------|
| Shore | —36° | —33° | 3° |
| Deck | —33 | —14 | 19 |
| Main hatchway . . | —33 | +28 | 61 |
| Bows (ld.) . . . | +48 | +49 | 1 |
| Mainmast | +42 | +50 | 8 |
| Gun-room | +43 | +56 | 13 |
| Cabin | +42 | +53 | 11 |

By the above it is apparent that we obtain 19° on

deck, and moreover free from any breeze or draught; 61° at the condenser over the main hatchway, and about 40° above the old snow-house for washing: to expatiate on such advantages would be idle. But what amount of perfection one would be warranted in anticipating under adequate fittings for Arctic service would probably still more astonish those who have hitherto been incredulous. The great point to which my present interest is directed will not undergo a fair trial until the spring, when with glazed windows adapted to our housing, I fully anticipate great advantage to the invalids, invariably invigorated under scorbutic affection by the sight of light and the sun's rays: in fact, in a deck hospital, under a temperature not much lower than that of our lower deck during the last season. Last evening, notwithstanding such imperfect fittings, we had an opportunity of testing the result of a strong gale, 5 to 8 from south by east, attended with considerable drift. Although the drift penetrated, abundantly showing every imperfection of our workmen, we contrived to preserve -8° on the quarter-deck, when the external air ranged -17 . During this breeze I momentarily expected some movement of the ice; but beyond heavy cracks and jarring of the outer ice, no perceptible disturbance could be traced.

We have now pretty well settled the true cause which produced the sensation to those ice-bound, and termed hitherto the snapping of bolts, etc. I have watched it narrowly, and for every crack so heard read "a crack in the floe, which instantly communicates itself to our musical box." I have traced them all satisfactorily, and I further notice, that as the ice increases in thickness, that

the sound is not so sensibly communicated. If the noise had resulted from bolts breaking, where, I would ask, would the 'Assistance' be now? But who ever discovered a bolt broken? And so convinced am I now that these noises will cease as the cold becomes more intense, that I intend to direct "every crack heard to be registered." If they should cease, even when we know the ice to be cracking extensively, the ship being isolated in her own piece of floe, surely no one will contend against what we experience and register! or let some better informed person instruct us why the 'Assistance' ceases to crack; or are all her bolts and trenails destroyed?

To meet the ideas of those who contended for ventilation, I tried an experiment on our main hatchway condenser, fitting two ventilators with the elbows of the cabin stove-pipes, of copper. The result was speedily determined: the temperature fell to 9° , instead of 24° . The lower-deck sleepers protested against the cold; moisture ensued: they were abolished, and all went right. Did I convince any one?

November 25.—Upon examination of the ice-gauge for the last twenty days, it affords a mean of 0.5 inches, or half an inch per diem increase, the mean temperature being -25.756° . This appears to approach to something like reason; for we find, with a temperature of -26° , that the ice at the surface of the sea will freeze more than four inches during twenty-four hours. This must also be much influenced by the depth, currents, nature of the bottom, whether rock, sand, or mud, as well as by any gaseous formation beneath, affecting the general temperature of the underlying sea.

As a table will be formed, exhibiting the progressive increments of ice during the season, it will be needless to state here what will then, I trust, be satisfactorily demonstrated by experiment, as well as the whole mode of proceeding.

The average temperature of this season seems to indicate a more severe winter than last: thus, last year we experienced, between the 20th and 27th of November, 1852, 'Assistance,' max. $+17^{\circ}$; min. -12.5° ; mean, $+0.380^{\circ}$; between the 20th and 27th of November, 1853, max. -14° ; min. -37.0° ; mean, -27.714° . The mean for the month, unless we have higher temperatures, must be low; that of the 'Hecla,' at Melville Island, in 1819, being -20.6° .

November 30.—Having completed the month, we will compare the results:—

| | Max. | Min. | Mean. |
|--|--------------|---------------|-------------------|
| 'Assistance,' month of November, 1853, | $+7^{\circ}$ | -37° | -18.330° |
| 'Hecla,' ,, ,, 1819, | $+6^{\circ}$ | -47° | -20.600° |

Carefully turning these matters over in my mind, it occurred to me that in the higher latitudes it would probably be found that a mean minimum temperature would prevail, notwithstanding sudden and unaccountable extremes, below anything experienced by our predecessors. I therefore referred to the records of the following vessels, as likely to afford me some insight into this presumed law. I found them to coincide most wonderfully, omitting for the present our own tables for 1853 until the completion of the seven or nine months.

| | |
|---|------------------|
| Hecla,' Melville Island, mean of nine months, } | -09.07° |
| October to June } | |

| | |
|--|---------|
| 'Enterprise,' Leopold Island | —10.44° |
| 'Resolute,' Griffith Island | — 9.57° |
| 'Assistance,' Northumberland Sound, 1852-3 | —10.03° |

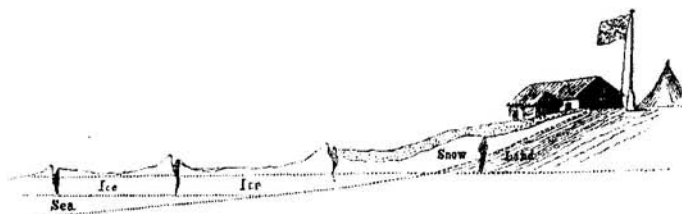
It certainly appears very strange that the results should so nearly agree, but it reminds me strongly of the general guesses which have been made since we reached these regions, not only in our times of starting, but in our general estimates of the operations to be executed, and the written orders issued in consequence.

It is true that the records of Parry's voyages, and some chance private manuscript extracts from those of Sir James Ross and Austin, happen to be in my possession, from which various questions have suggested themselves, and so far experience may be said to have lent its aid; but it may naturally occur to my readers, Why cannot all officers commanding such voyages adopt the law of the profession? Why is Parry's the sole official authority? We have no published information from Sir James Ross, Austin, or Saunders, to aid us either in temperatures, tracks, *homeward* or outward! no seamanlike observations to guide us in the selection of a homeward route. The profession may exclaim, You must exercise your own ability. That I am prepared for, in so far as experience has been gained; but when called on to write instructions, and to direct a vessel to pursue a certain course, for her safe as well as rapid voyage to England, I should be prepared with some reason to give for the selection of a route which may differ from the only record supplied by Parry in his voyages of 1819 and 1824.

Here I am sent to discover quite as much as Parry was on his first voyage, and, in many instances, find

the aspect of affairs in 1853-54 to differ materially from that recorded in 1819 to 1824; and yet five Expeditions have since visited Lancaster Sound, without having recorded their opinions or furnished tables of temperature, or remarks upon the ice navigation of Baffin's Bay! Fortunately, some previous acquaintance with the peculiarity of cold climates, and a close study of certain theories connected therewith, have enabled me to form, as they have eventuated, just conclusions, but nothing to warrant deviation from the beaten track,—nothing but presumption,—should failure have occurred. Too true the adage, "Success is wisdom;" but, had misfortune resulted, no one but myself can feel how many disappointed opinions would have been hurled at my arrogance! It is a very slippery climate and a very slippery service. Prosperous as we have hitherto been, I still shall rejoice with no common joy at my completion without disaster.

Today I examined the tidal fissures on the coast-line; it was nearly high water, and the cracks did not afford



so perfect an exhibition; nevertheless the upper gaps were wide, and convinced me that the general motion of the ice must be insensibly, as we have no gauge to determine its action, drawing off-shore. In some in-

stances the in-shore pressure was visible by the arching or buckling of the ice, which I have endeavoured to exhibit in one of the Plates, as well as at page 149, Vol. I. The curvature, in a span of eighteen feet of the in-shore ice, was three feet; in twelve outside, two; but nine cracks altogether between the ship and the beach.

The angular edges of the gravel terraces, numbering twelve from the beach-line to our nearest rise or first plateau, were completely denuded of snow, and exhibited the formation due to about one hundred feet vertical elevation very prettily.

Our Allsopp's ale being expended, we commenced our ship brewery last week, as well as the cultivation of mustard and cress, the results of which will be found tabulated in the Appendix.

December 5.—Our experiments on the freezing of the floe seem to preserve a very regular progress, not exceeding half an inch per diem; indeed, considering that the floe has now attained a thickness of three feet, I cannot imagine that any further decrease of temperature above the floe-surface will materially affect this apparent fixed scale. The increase at present must depend on the temperature of the sea beneath, which during winter we have found to maintain nearly the freezing temperature. Last year I noticed that water taken at six fathoms below the surface, and suddenly brought into my cabin in the bottle by which it was procured, exhibited a floating white surface of two inches, which, on close examination, was found to be composed of fine detached stellar crystals. I further noticed that the main body of the fluid was also fully charged with these crystals, and

that until the temperature rose they maintained a constant motion towards the surface. No ice formed; it was like brilliant snow, and not cohering. • It immediately occurred to me that such a process, constantly in action beneath the floe, may possibly, by cohesion, afford the small daily increment which we have just noticed.

At noon today the light was as clear and bright as a December morning in England; the stars were still brightly visible to the northward, but the southern arch of light, only illumined to about twenty degrees of altitude, and tinted pale rose and yellow, rendered even those of the first magnitude very indistinct. We have not now for some time experienced any decided motion of the ice, and begin to feel that we have a chance of resting quietly in our ships for the remainder of the winter.

The cold has undoubtedly penetrated the ships laterally, and to such a degree that some of Allsopp's ale, stowed at the end of Sylvester's apparatus, and which does not freeze until the temperature falls to $22\cdot5^{\circ}$, was found congealed in the neck of the bottle. I have therefore had an ice wall built round the after-part of the ship, and filled in with loose snow. To those who may take bottled fluids to such climates it may be useful to know that, if champagne bottles be used, the ice forms in the neck, expels the cork, and performs its duty.

The deck temperatures now average from nineteen to twenty degrees warmer than the external air, excepting when we have a strong wind, when the bare hangings, of loose sails, will not of course impede the passage of snow-drift; but this does not at all affect our internal tempe-

rature, which ranges between 40° and 50° , and 35° to 45° in my cabin, where Sylvester does not aid.

The loading the decks with gravel and snow has of course been superseded by the dry wood deck, the temperature of which cannot well be proved. A very great advantage is thus secured, as the removal of the snow and gravel (literally ice) damages our decks and glass-illuminators considerably. Last season the cabin skylight was filled in with oakum, and became almost a mass of ice. It is at this moment free even from internal frost on the glass! The clock occupies its summer position, and is read off from my upper condensing house by the sentry on duty on deck.

December 8.—I was agreeably surprised to find a very refreshing salad of mustard and cress placed on my table, and further, that an issue of seven pounds had been administered among the crew generally. This exceeds our gardening of last season, when I perceive that our first issue of three pounds took place on the 1st of January. Certainly that before me was rather deficient in its natural colour; but our eyes are now so very weak and jaundiced, that I must imagine they deceive me; in flavour however it was perceptibly grateful. We have also commenced brewing spruce beer, for the use of the invalids. The first porter brewery has proved more successful, so that we are evidently becoming more *au fait* at these matters. As regards the condition of the crew generally, they appear to increase in size, probably the result of additional clothing; they are nevertheless fuller in countenance, and the brightness of the eye assures me that their general health and cheerfulness are not im-

paired. On the 1st and 14th of each month they undergo a close inspection by the surgeon, but specially as to any indication of scorbutic affection. I regret however that two of our invalids furnish very anxious cases. One, attached to the 'Pioneer,' exhibited symptoms of scurvy in June last; the other, in this ship, commenced with disease in the bones of the right foot, evidently scrofulous. These have remained much the same for the last six months; but within the last few days it is very apparent that they are much reduced by inaction and confinement to their cots.

We have been particularly exempt of late from even moderate breezes, but the lofty fleecy clouds seem to travel with some rapidity from the southward. This evening I went out to look at the moon passing our meridian, north. I found it encircled with a peculiar dancing image, which I at first ascribed to defective vision. Shifting my view to the stars, I found my sight to be perfect. Determined not to be put out of countenance by the lady, I again faced her. I now discovered a very beautiful play of radial coruscations, expanding and contracting like the pupil of the eye under sudden changes of light. One cause probably might be referred to the increased or diminished light on my own optics; but the other I detected to proceed from very light fleecy vapours passing over the surface of the planet, and, according to the number of laminæ or their density, producing this flickering radiating appearance. Although calm below, the breeze aloft urged these mists with great rapidity.

At a later hour a very clear exhibition of paraselena

occurred, nothing however to compare with the splendour of that noticed last season; but two well-defined luminous spots were observed horizontally, and a trace of one vertical to the planet. To the southward the horizon reminded me of the reflected gas illumination so well known to pervade the atmosphere above London; at times I fancied I could almost distinguish some brilliant lamp. Last year Venus exhibited herself something in this manner above the pack, and presented a most beautiful pharos, but at present she has at least forty-five degrees of azimuth to the eastward. It may yet have been a reflected star, or one of imagination, and rather forcibly brought to my mind, "What would I not give to wander?" However, duty keeps us here, and a cold one too!

On the 17th the weather proved beautifully clear; shortly after noon I strolled towards the Crystal Palace, which has lately been devoted to the use of the skittle-players. At these springs the tide rose higher than usual, and my attention was attracted by the repeated noise resulting from the cracking of ice, as well as snow. It occurred to me that part of the noise resulted from my walking over the floating ice. I stopped five minutes and listened attentively, when the nearer cracking noise apparently subsided. As I again proceeded it increased decidedly; and on entering the snow its peculiar rushing noise, as of the escape of air, became very apparent. In the summer this latter sensation is at times startling, and, I believe, results from the air generated beneath by the sun's rays forming an ice-crust, thus causing a rushing sound in the ears as it escapes at the fracture made by

fort a severe hardship. This is merely my private opinion, not discussed; for we had not the most distant idea of going home last season; indeed, although I should have left the 'North Star' at Beechey Island, I had already determined, if I passed that position, to have wintered in Pond's Bay, the Clyde, and other positions, where I am now convinced that search for traces of Sir John should be made, convinced as I am that he never passed up this Channel.

December 25.—Here then we have reached Christmas Day,—not unlike any other, but Sunday adds to its solemnity, and brings our day of rest from bodily, but not mental labour. This morning the ice was gauged, and found to be three feet eight inches, = 44 inches, or at the rate of 0·45 during the last ten days, the previous ten being 0·35; which will hereafter be reduced to a tabular form, as well as the effects of fittings, which afford 19° increased temperature on the quarter-deck, without wind, and in the main condenser over the main hatchway (open) 46°, the external air being only —19°.

I first visited the 'Pioneer,' and although that is now our hospital, and some allowance must be made for two invalids in a very doubtful state, still there appeared to be some attention to the comforts of the season. One of the invalids indeed appeared to be in higher spirits, and took a fancy to a glass of champagne, in which, of course, he was, with the doctor's permission, indulged.

At noon I examined the good cheer and admirable taste and comfort displayed on board the 'Assistance;' and as I saw enough to describe, I shall not omit giving

an outline, commencing with the Marines' mess, on the port or left side aft, of which our Sergeant, George Jeffries (formerly one of the heroes of the 41st at the Cabul Pass, etc., in 1842, and a most exemplary soldier here) presided.

No. 1.—*Motto*: "ROYAL AND LOYAL."

A very neat chandelier, tastefully got up with coloured paper, tinfoil, etc., having the National flags on the circumference, supporting the colours of the Royal Marines.

No. 2.—*Motto*: "THE OLD HOUSE AT HOME."

A very gaily fitted chandelier, bearing the National Colours, above which was an excellent representation of the misletoe, the whole surmounted by a large crown, formed with coloured papers. Two tablets with English ensigns worked and painted on them.—(Briant, Artist.)

No. 3.—*Motto*: "THE WEDDED MANSION."

A portrait of the wife of W. R. Huggett, A.R., and a neat chandelier. The dinner appeared tempting, and everything emblematic of home: but I looked in vain for the wives who had so tastefully laid it out. I at once thought of the domestic sailors.

No. 4.—The Bows (artificers' workshop). *Mottoes*: "WISH YOU A VERY MERRY CHRISTMAS," "THE WELCOME HALF-WAY."

This space was enclosed with a new white St. George's Ensign, hiding the sides, etc., and forming a very chaste alcove. In the centre a throne, and above a small regal crown, awaiting only Her Majesty's presence. It was expected, I imagine, that I would be seated there: but it was a bad bait, although one's loyalty can hardly be doubted here. Two large crowns on either side, Plates of the Queen, Prince Albert, and the Royal children, supported by the Crystal Palace, and Jenny Lind, occupied the back ground, the whole lighted by a very tasteful chandelier, bearing the National flags. Entering on the left the passage was labelled "Albert Street," that leading out "Queen Street."

No. 5.—*Motto*: "THE JOLLY BACHELORS."

Starboard side, "Bachelors' Hall" (opposite to last), "God Save the Queen," "Dieu et mon droit." A chandelier tastefully fitted and surmounted by the war medal of J. Galavan, Captain Forecastle; seven-

the foot. In the case before me I can only imagine the surface snow to be supporting in the arc the warmer air resulting from the radiating tendency beneath, which any vibration would assist in breaking at the arc. On board I have frequently watched footsteps from the 'Pioneer' to the ship, and detected the sharp crack of the ice as the party reached the gangway; or, in olden phrase, "a bolt cracked." At each operation of breaking the ice at the fire-hole a similar noise is detected, and in my bed-place is particularly perceptible.

On the 18th I inspected the 'Pioneer' hospital, but found her close, and not, to my senses, so completely ventilated as the 'Assistance;' odours from rope, tobacco, etc., reminding one very much of the first night after leaving a dockyard. On my return the clerk, by the light on the floor, was able to read small print, but "love" was the word he hit on.

December 22.—Our mid-winter is past, or the supposed winter of England commences; why so termed I cannot conceive, as from the 1st of November until the 10th of March, or later, the actual cold continues: the 15th of January is nearer the true period; however, to us the shortest day, and, even with a diminished moon, it is perceptibly lighter. This may arise from the sun's rays to the southward being less obstructed by clouds; for the illuminated vault must, in some measure, be affected, either by the absence or presence of vapour or atmosphere at a sufficient elevation to reflect the light. One decided proof of an intervening medium is the diminished brilliancy of the stars.

December 24.—Mighty preparations for the morrow

no riveting up of armour for the battle, rather the destruction of iron cases labelled 'Hogarth,' 'Fortnum and Mason,' 'Masson,' etc., which have confined within their iron bounds the customary issues of extras for Christmas cheer, not forgetting some of the despised *lummes* brought up by the sledges from 'North Star.' The bill of fare for this season may not prove as luxurious as the last; nevertheless even *lummes* are acceptable: a flock of sheep would have been more to our purpose. It brings very forcibly to my mind poor Sir John Franklin and the stories about such birds, of one-tenth the weight of *lummes*, salted down by him, possibly for some similar purpose,—a gratuitous addition to some festive meal! May God's blessing attend their enjoyments! No man can be happy unless happiness is reflected from the enjoyments of those around him, and I see with very different eyes what I beheld at the last anniversary. Then, each was actuated by the novelty of the first Christmas in the Polar regions; now, many feel the disappointment at being hemmed in here, without further prospect in spring than double and very severe duty, with very diminished appetites. Let not closet schemers discuss the question of supplies; we have abundance; but two seasons sadly cut down the appetite, and it would fare hard with many fine men here if they were compelled, without sufficient excitement, to undergo another season north of Beechey Island. Volunteers as we are, or the fact of being caught like the 'Investigator,' would enable us to go through our imprisonment better than our neighbours, for we are amply provided; but at the very threshold of the English post-office married men will pine, and think even com-

ral good plates, one of roast beef, too good to be true; some carvings of the Arctic ships under sail.

No. 6.—*Motto*: "THIS POOR MESS IS LOST FOR WANT OF TOOLS." A neat chandelier, and a good sketch of a good English Christmas dinner.

The following decorations were noted on board the 'Pioneer':—

No. 1.—A neat chandelier, with the national flags.

No. 2.—A neat chandelier.

No. 3.—A neat chandelier, national flags, and a print of Britannia.

No. 4.—A gay chandelier, surmounted by a figure of Her Majesty; several scenes taken from the 'Illustrated London News.'

The Christmas cheer was disposed with great effect, and although at the time I was rather an invalid, still I felt some inclination to sit down and gratify them by participating. At the moment I felt suddenly weak, and had barely time to accept from the wedded mansion the cake and wine presented.

One wish I did secretly breathe,—that these fine fellows may find their next Christmas cheered by those of whom they now evidently thought so much. But to my toast:—"Our Gracious Queen, Victoria, God bless her!" "Prince Albert, and all the Royal Family!" "Our absent Squadron companions, who will not forget us; may they be as safe, happy, and comfortable as yourselves, and God bless them!" And now, "May you enjoy as happy a Christmas as I wish you! May you be as well, even better, should it be our fate to be detained here another year,—and may God bless you all!" I then left them to their revels, and never do I recollect a more orderly conducted Christmas.

December 29.—The week has passed quietly, but

cheerfully, singing during the evenings appearing to be the prevailing humour among the messes. Last night heavy sounds were distinguished in the direction of the outer ice, consequent on splitting, by tidal or other causes. The pack outside of us is also much cut up by the unequal pressure of the masses, exhibiting some very awkward cracks for travellers. At noon the light was sufficiently bright to read small print, the atmosphere also very clear.

The principal exercise and amusement now,—for it is very hard to make men amuse themselves, or to find matter on which to work,—is skittles, which is played in the Crystal Palace. A wolf has paid frequent visits, and at times appeared inclined to fight our dogs; but Lady Fanny, ever on the alert, is sure to arrive in time to rescue poor Punch, who, though game enough, is very uneasy on his pins, and has but few serviceable teeth remaining.

December 31.—They are now singing the year 1853 out; but, from all I can collect, the greater number are inclined to do the thing more sensibly by sleeping the New Year in.

Fortunately a change of temperature enables us to place our thermometers in the snow bank, but the period was but short, falling during the operation to -10° : the result will appear hereafter in a separate Plate, when they are read off. On this occasion they were in a more sheltered position, filling up the angle formed by the western and northern sides of the Crystal Palace and the Observatory. As the numbers will indicate, they were placed respectively that distance in feet below the

surface and from the exposed sides of the block: that placed in the ground tube occupied a position between the block and the Observatory. Our anticipations of decrease of temperature were in this instance groundless, as with the increase of wind it rose rapidly to $+25^{\circ}$. Aloft it evidently blew a heavy gale, of which we were merely entertained with the whistling and rattling of our loose gear aloft. On the floe, however, a very considerable accumulation of snow-drift was deposited, much in the same manner as last season, and although not so high, afforded a comfortable promenade around the ship.

The recurrence of this forcibly brings to my mind the reports of houses, tents, etc., overwhelmed by the snow-drift of a night. There can be little doubt that under circumstances favourable to deposit, as flocculent snow, low temperature, and no reverberatory action by state of the wind, this could easily happen. But our observations here teach us that the drift snow of an Arctic winter is of an entirely different disposition. I have before remarked, that it is not properly snow, but very fine drift ice, which is transferred by the slightest action of the wind. This is particularly apparent on every abrupt angle of the terraces, or smooth rounded summits, of the coast-line. Last winter it did not surround the Observatory, nor the boat under which the standard thermometers were placed, nor the washhouse,—on one side it rested, but not to press on or incommode. Indeed it so happened, although on opposite sides, and within a few yards, that the reverberatory breeze deeply scored, or furrowed out, spaces where absolutely convenient; forming indeed a protecting guard, with a space between it

and our objects of some five or six feet. This any rational mind will comprehend as the effect of an eddy wind, and the elevation and firmness of such a deposition, reaching to that exhibited in the former volume, depends entirely on the force and continuance of the breeze, as well as the surface of the body deflecting it, until it becomes of no further importance by the greater elevation of the snow-wreath to windward. If this overtopping wave of snow-wreath should reach the object, doubtless the bank would form a solid bridge. Even at this season we have several very pretty illustrations; first in the Crystal Palace, next in the tents pitched beside it, and thirdly in the cask inverted over our ice gauge on the floe. In the Crystal Palace case the breeze has furrowed out a fair passage to the principal entrance on the south, and behind, where the provisions have been stowed,—enabling us to dig them out as required.

The tents, particularly the circular bell tent, from constant vibration, throw off any snow which falls, and the breeze prevents its resting within a deep circular ditch, having full three feet depth of snow surrounding it; and the inverted cask on the floe equally bids defiance, preserving its base free by a similar furrow. If the ship was not so well sheltered by high land from the prevailing winds, doubtless she would exhibit another interesting snow-wreath.

CHAPTER IV.

Increase of Temperature.—New Year's Day.—Cold Periods.—Death of George Harris.—Remarks on Scurvy.—Prismatic Cross.—Dead Men's Effects and Wills.—Cracks in Grounded Ice.—Rise of Water.—Death of Isaac Burnett.—Extreme continuous Cold.—Racing.—Condensers.—Similar Temperatures.—Re-appearance of the Sun.—Preparations for Travelling.—Instructions to Richards and Kellett.

January 1, 1854.—THE aspect of the snow around us this morning forced on my imagination, perhaps fanciful, the idea of a watchful mother spreading her graceful arms around some cherished object, and protecting it from injury; the greater elevation of the snow astern representing the breast, and the gradual tapering to the bow the arms, probably the nucleus of a more elevated defence against the breezes of February and March.

The increase of temperature, at present $+26^{\circ}$, so far from proving acceptable, is viewed as a perfect nuisance, causing wet decks and a very sloppy floe. But let us not hastily complain: that very softness and high temperature will undoubtedly act to our future comfort and advantage by filling up with snow, consolidating and smoothing, the present inequalities of the pack, which, in its present crude and angular chaotic condition, would

render spring travel almost impossible. We hardly look beyond our present sensations; but having experienced a temperature of -46.5° but three days since, it is not probable that we shall be long in this fancied misery.

On this, our New Year's Day, I have inspected our home department between decks, where I was pleased to notice the same comfort, good humour, and good cheer reigns. I had but little to add to my Christmas toasts, but the wish, which many emblems exhibited forcibly brought to my mind, that they had the fairer part of the creation to warm their hearts and render enjoyment more rational. After the customary toasts of Her Majesty, the Prince, etc., I had only to express my wish that the opposition between the adverse berths, married and bachelors, might be swamped by the single becoming married and the married happy, sentiments which seemed to find an echo even in these dreary regions. The preparations for enjoyment were apparently on an increased scale: comfort and cleanliness, those virtues inherent in all well ordered and well disposed seamen, prevailed; and happiness, if that commodity ever reaches thus far north, I have reason to hope was in a small degree disseminated. What robe she adopts here it is difficult to determine: if white, how happy and innocent we should be! the *couleur de rose* is not traceable.

January 5.—The result of much noise and anxiety proved that Punch had again got into bad company with the wolf; but his faithful ally, Lady Fanny Disco, in the most affectionate manner, rushed to his rescue, and brought him home to his family. Daylight, or the grey tint of an English morning, is now fast extending, and

about the 12th of February we shall be keenly watching for "the prodigal's return."

January 8.—About this period last year we experienced our extreme range of cold, but this season it seems to observe nearly a week or a quarter of a moon later, which would accord pretty well with the difference in the times of full moon,—indeed, almost a complete substitution of the full for new, less four days. Under our present temperature of -42° I never witnessed our lower deck in a more dry or comfortable condition. Our system has at length not only become completely established, but even the most sceptical are now almost as determined in their commendations.

January 9.—Yesterday I noticed a wolf prowling alongshore when I left the Crystal Palace: had he been inclined, he might easily have cut me off, as no one was in sight to alarm, and I was too weak to make any run. Today, hearing his howl in the direction of where our men were at work obtaining clean snow to melt, I sent a man with a musket for their protection. I found afterwards that there was but one man, J. Billett. He described the wolf as close to him, and "that he was howling in concert to keep him off." The wolf did not tarry for the arrival of the man with the musket: they are much too cunning to be taken.

January 10.—Shortly after midnight, at 0.20, George Harriss, one of the invalids on board the 'Pioneer' tender, departed this life. I fully expected his decease within the week, having made his will the day before, and evidently felt that he was going. He was taken ill about the 25th of April last, complaining of cough, pain in the

chest, and weakness. He was absent on sledge duty with the South-west Division, but returned on the 3rd of May, complaining of pains, and weakness of limbs. It appears that he was discharged in six days from the list; but after my return on the 26th of June, he was reported as affected with scurvy; and having examined him then with the Assistant Surgeon of the 'Pioneer,' his body and limbs were covered with small spots like boils, but with dark ringed bases,—in fact, such an eruption as is often noticed in pauper patients in England.

Having witnessed a great deal of the worst kinds of scurvy, as well as that resulting from no known cause, on the coast of Africa, I did not think the spots alone warranted scurvy. However, at that period he gave way, being of a very slothful habit, difficult to keep clean, and, as I clearly foresaw, would hasten his own end by the want of common energy so inherent in seamen generally when they, as we term it, "take sick."

The attention of the Assistant Surgeon, Mr. Ricards, was unremitting: he personally attended, washing and sponging him; but no feeling of gratitude seemed to occupy the mind of the patient. Indeed, I cannot sufficiently admire the untiring zeal of the medical man with such an ungenerous, stubborn patient. I visited and endeavoured at times to draw him into conversation, but it was painful. If I had been, from some remote suspicion in his mind, the direct cause of his illness, he could not have displayed more moroseness; indeed, from the first moment I saw him in June last, he seemed to have "made up his mind to die."

This probably is one of the peculiar tendencies or af-

fections of this disease. I have heard of people begging to be buried up to the neck and left to die, rather than be moved. He never rallied, was helpless since August last, and, gradually losing the powers of speech and breathing, died without pain.

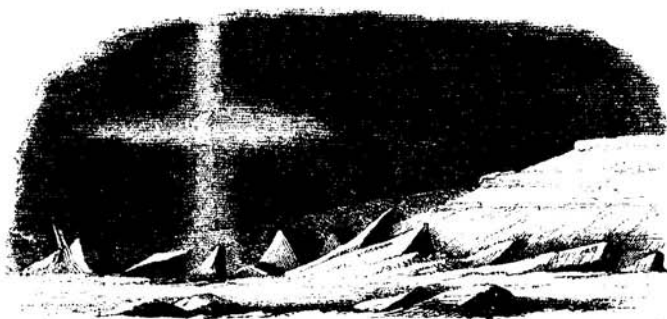
This case brings me to remark, although not applicable to the deceased, the danger of bringing seamen the second cruise to this climate—"because they have been here before."

I entertain the opinion that this is wrong, both in officers as well as men, *Captains* excluded. *They* know the defects of "last cruise," and can see that they are remedied; but in no single instance (and I have not been idle) have I been able to detect any advantage resulting from the entry of "old hands," indeed the reverse. All are given to talk: thus, "Oh! Tom D—— fell ill just in this way,—no scurvy, not a bit of it; he had a bad arm, it got worse, he died; and then they found it was all scurvy." These men are the first "hipped," and for sledge-work are next to useless. Last season I consider them to have broken down, and through the toils of this their pluck may carry them, but home they must go by the next opportunity, and what is the result? The feelings become unduly sensitive, irritable, and embittered; and they talk what I must, in compassion for their infirmities, term nonsense. Still however nonsense is contagious; it depresses those around them and creates dissension. These seers are prophets of bad omen.

January 12.—The wolf has become very audacious, having bitten the small bitch belonging to the 'Pioneer.' A trap has been constructed and very alluring baits laid;

but hitherto without success. He might have been shot from the ship, as well as from the 'Pioneer;' but some tales of the Boatswain and some of the men or dogs being mistaken for the wolf, determined me on forbidding any attempts to shoot him near the ship.

Today, on my stroll towards the Crystal Palace, I noticed a most beautiful phenomenon (noticed in 'Pioneer's' log-book); indeed, I much doubt if in the days of Columbus the whole crew would not have been turned out to pay the customary adoration. I was startled, and remained



stationary for some time, watching the apparent vision. It was the customary cross formed on the moon, but in this instance, being at a low altitude, north-east, a broad pyramidal base tapered from the floe to meet the vertical ray, and thus a perfect prismatic cross, with its pedestal, was most completely represented as rising from the floe. This occurred at two days before the full moon.

On that emblem, whatever his creed may be, no one can gaze without feelings, varying according to his education, moral as well as religious !

My course led me on to the grave which our seamen were digging, near the Observatory. At this season this proved a very difficult operation, the ground being frozen at one foot below the surface gravel, or, more properly, comminuted limestone; for gravel, properly so called, does not exist in this neighbourhood. Such work we found tried our tools severely, and from the low temperature rendering the metal brittle, they flew like glass. With loose stone and ice it is easier than with clay, which is absolutely attended with danger, splintering like glass.

Seamen are generally disposed to follow out the last duties to their deceased messmates to the extreme of their available means, and, as in the case of our Marine deposited on Mount Beaufort, the coffin was covered with fine blue cloth. As I was unable at the moment to attend to the funeral service, and necessity did not call for the immediate exposure of all hands to the present biting temperature, I found it more convenient to deposit the coffin on the covered-in forecastle of the 'Pioneer' until a warmer opportunity favoured. But when will seamen cease to be superstitious, or when will educated men cease to foster such prejudices?

Quitting this question, another arises, on the will of a person dying at sea. In the Admiralty Instructions nothing satisfactory on this subject is to be found, but the chattels and effect of every person dying at sea are "to be sold at the mast." This brings to my recollection a very interesting case which occurred in the year 1823, on board H.M.S. Salisbury, at Bermuda. A mate, named Wharton, was drowned; he having a presentiment that his death would be sudden, and, as it happened, ob-

tained a promise from a messmate, that, if he died or was drowned, he would destroy certain sealed documents in his desk. The case was referred to the Captain: he referred the matter to three Lieutenants to report upon. The two seniors decided to burn; the junior was of opinion "that it was illegal; it might be a will or family deeds, and, being dead, not his certainly; having died without a legal will, they were in the hands of the legal heirs." They were parchments, and they were, with some difficulty, burned! Let legal men declare, if the actors, who (excepting the party protesting) are now dead, were not wrong, at least before determining, by the preamble, of what character they were. I had a strong suspicion, from the character of Wharton, that they were of great importance to another party, and I urged the matter strongly against the act before the deeds were destroyed: but I was too young to have influence! The law on these matters should be fully set forth, for the information of all officers in command.

The 'Pioneer' having been fitted, in pursuance of orders, in a similar manner to the 'Assistance,' I was gratified to find that the same difference of nineteen to twenty degrees was found to prevail between the external and internal air on deck, as has been experienced here.

January 19.—Although the temperature has fallen to -52° , the cold has not been more sensibly felt than if it had been at 32° , owing to the absence of wind to press it to the body. The light has now become very bright, attended with bright auroral tints near the horizon, and fringing the hills due south.

Seven distinct cracks near the coast-line mark the lines where the ice rests upon the bottom, some gaping so wide that it requires caution to step over them. In several places, where rocks doubtless occur beneath, the floe is broken into very obtuse pyramidal irregularities.

January 22.—Under the low temperatures which we have lately experienced, -54.5° , the condensation at the bows, and about the mainmast, seems to call for further experiment. I have therefore opened two illuminators forward, and inverted casks over the orifices, securely fitted with oakum, etc., and further opened up the officers' companion, abaft the mainmast, three feet above the deck, covering it well with canvas. These seem to have acted very decidedly, by accumulating vast depositions of ice; indeed it is very clear to my mind that materials only are wanting to remedy instantly any defects of this nature as readily as they may present themselves.

It is my firm conviction that we are far behind in all the arrangements, and an entire new scheme should be adopted in the fitting of Arctic ships. All cabins should be free from the sides, and occupy the midship lines, with a free course for warm air round the wings from stem to stern. The messes should be placed amidships, and closets along the whole sides, for preserved meats, etc. This would not only enormously increase the stowage, but render the distribution of small stores much more convenient, and destroy all nests for ice, excepting such as would act beneficially, serving as condensers, from whence, having no shelves, the ice could conveniently be removed when expedient. However, as it is

my firm conviction that no further movement in this direction will again be attempted by Great Britain, it is needless for me to dwell further on the means I would propose.

During my examination of the in-shore fissures today my attention was excited by noticing some of the fissure edges raised much above their natural level, indeed beyond the limit where the tidal force should be exerted. The question naturally occurred, Does the ice in winter attract the sea, or does it afford any similar action to the capillary or sponge, to enable it to lift the inner or depress the outer portion? for clearly the water now acts beyond the tidal range of summer. Travellers indeed see strange things, but in no part of the world more unexplained and interesting matters than are daily presented in these inhospitable regions. Elsewhere the mind is perhaps more completely engrossed by subjects of greater interest; here every incident furnishes matter for deep study.

In order to satisfy myself upon this subject I revisited the spot at low water; the chinks or fissures varied from three to four feet in depth, and occur above the line of forced-up ice. Their sides presented, even at such an elevation, eighteen inches of visible clear ice, and on their sides the various gradations of efflux, in crystallized shelves, clearly indicated the action of the receding tide. The only mode by which we can account for this action, or flow above the natural level of a summer tide, is by supposing that the quantity of ice in-shore will not rise or yield, and that the infused fluid, unable to find vent, flows up by every available fissure.

If this reason is tenable, it should also find its way up off-shore at the fire-hole cut alongside the ship.

January 28.—This afternoon, at 2.20, Isaac Burnett, Captain of the Maintop, died at the hospital on board the 'Pioneer.' In April last he complained of weakness and pain in the ankle, and was consequently withdrawn from the travelling party. As this progressed a disposition to scrofula succeeded, accompanied by disease of the bones. Latterly he had exhibited a more healthy condition, and I had strong hopes that he might reach England in time to save life; but since the death of Harriss he evidently became more depressed, and exhibited that peculiar quickness of feeling, and irritability, the peculiar attendant on scorbutic affection, which probably prevented his recovery. Eventually, effusion on the chest became apparent, and in the act of making some trifling exertion he expired, quietly and suddenly, as the Assistant Surgeon sat beside him; so rapidly indeed, that he was dead before the Surgeon, who had just quitted, could be recalled.

This case resulted in scurvy, owing to confinement and inactivity in a confined sulphurous atmosphere for a very long period. After his decease I discovered that Harriss and himself had been shipmates and second-captains of the foretop in H.M.S. Ganges; and from my observations on other persons, who were found to be partially affected with scurvy, I am satisfied that the mind will predispose otherwise healthy subjects to this insidious disease.

January 29.—The weather has latterly continued fine, and the natural result has been that we have experienced

a more continuous degree of cold, searching indeed every part of the ship, and affording perhaps the greatest degree of continuous severity on record; thus,—

For 84 continuous hours, mean, -54.905° ; max. -50° ; min. -59.25° .

48 " " " -57.125° ; " -55° ; " -59.25° .

24 " " " -57.125° ; " -55° ; " -59.25° .

I shall insert also, at this period of extreme cold, the comparative temperatures resulting from our improved measures for warming the vessel internally, or of retaining our heat without detriment to perfect ventilation:—

| | | Difference. |
|---------------------------|---------------|--------------|
| External air | -57° | |
| Upper deck | -29 | 28° |
| Condenser (main hatchway) | $+23$ | 80 |
| Between decks:— | | |
| Bows | $+45$ | 102 |
| Mainmast | $+45$ | 102 |
| Gun-room | $+50$ | 107 |
| Cabin | $+40$ | 97 |
| Spirit-room | $+36$ | 93 |
| Main hold | $+52$ | 109 |

It is customary to presume that the Captain will enjoy the greater degree of comfort; but I have a notion (under the fear of contradiction) that he is the most miserable, uncared-for individual in the vessels engaged on this service, and that, in order to watch the interests of all entrusted to his care, his *amour propre*, or general pride, in pursuance of naval discipline, impels him to exhibit

that what he, in his person and place, can endure, all others should submit to without murmur; indeed, the night temperatures, notwithstanding a continuous fire, were intensely felt in my peculiarly weak condition.

There are some individuals who cannot be made to say what they feel, or, indeed, too much inclined to assert that quivering accents do not proceed from cold. For my own part, I do admit the present temperatures to be really cold,—undoubtedly, unpleasantly severe; but, setting aside our own arbitrary expressions or scales of cold, let us inquire what Nature is doing around us. The intensity of cold is stealing, through the sides and thin casings, to the interior of my fire-warmed cabin, heated up to $+41^{\circ}$, not too hot in England. But as these words do not convey the meaning I wish to impress, I will just add, that cold is particularly attached to iron, and that it will follow it up most affectionately through the sides, vertically or horizontally, and that even brad-heads, covered with putty and painted over to *misrepresent* wainscot, condense the breath and moisture in pearl-like hemispherical dots throughout my sleeping berth; that if these jewels be removed at night, they are replaced in the morning.

It was the custom for all the officers to meet on Saturday evenings and enjoy a racing game, the board and horses of which were most kindly presented to the officers, etc., by Lord Londesborough; and the effect of assembling a dozen persons for three or four hours was, first, to cause the polished mahogany to stream, and before morning to present a polished surface of ice.

At present the French polish is peeling off, panels

cracking with loud reports, joints opening, and every symptom, to men of common observation, of extraordinary dryness, the result of the absorption of all moisture which the icy surfaces can attract. Aboard my cabin, in two extensive store-rooms, some devoted admirer of Nature's wonders might enjoy himself for hours in studying the splendid gem-studded beams, bristling with the largest and most perfect specimens of ice crystals that, even in fairy dreams, he could have imagined; indeed they were two ice-caverns, and took up greedily every particle of moisture that could flow to them.

Have I sufficiently impressed any one of my readers with the chill which, to a solitary naval chief, should pervade my winter prison? If not, the only mode I can recommend is to volunteer to come out and try such *solitary confinement*. If it be suggested, that it is easy to find companions, I can only reply, that some prefer sleep; and sufficient topics, even in tins of preserved meat, were not supplied to maintain interesting conversation. It is this very scarcity of matter which drives us to seek it from Nature, and even then, without congenial minds to discuss it, alone.

The low temperature to which I have referred is evidently much more keenly felt by those who have been exposed to it, and even by those in charge of watches, under infinitely greater protection, than last season, when our lowest, -63.5° , was almost unnoticed. But as regards my own feelings, beyond the moment, I am not a competent judge, being at present an invalid.

January 31.—The day being peculiarly fine, and temperature at -40° , I strolled as far as our first terrace, and

was surprised to notice the floe seaward to be apparently very smooth, all the rough or pack ice being confined to the region near our anchorage;—I use this term now, because we have indeed both anchors down (truly moored). I cannot account for this appearance, except by the inference that the breeze reached the ice about half a mile off shore, and has by this mode filled up the irregularities with snow. The track also of our intended sledge journeys alongshore appears to offer smooth travelling as far as our view extends.

February 3.—Our temperatures still continue very low, particularly in a continuous stream of cold, the mean of 102 hours giving as under :—

Max. -50° ; Min. -59.25° ; Mean, -54.34° .

In my attempt today to examine the outer ice I found the cracks to be numerous, and so loosely filled in by snow that I was unable to venture beyond the pack. Commander Richards, who went beyond, informed me that the external floe is smooth, free from cracks, and is likely to afford fair travelling. The large masses of ice in the neighbourhood of the ship, or particularly ahead of her, present more confusion than I had imagined, exhibiting rents in every direction. Temperature alone could not effect this; I therefore imagine that the surrounding masses, rising and falling with the tide, have proved too heavy for the grounded masses to support.

With reference to the continuous degree of cold registered by us, I notice in Captain Parry's Journal at Melville Island that he experienced fifteen hours at -50° . (The narrative gives 54° , but the tables 50° , as the mini-

mum ; I suppose therefore that the thermometer had a correction applied when the tables were completed.)

“ Splitting straws ” here is cold work, but where the mind has no time for rest there must be ample food for theory. It is our business to find *facts* to uphold or demolish. The present discussion suggested to me the probability of an average degree of heat and cold due to these localities, within certain parallels, which might be deemed fit for comparison. Fortunately, I had taken the precaution of collecting such documents as would be of interest to me, and I now find, curiously enough, that the following very close comparisons result :—

| | |
|--|---------|
| In H.M.S. Hecla at Melville Island during 273 days | — 9·07° |
| „ Enterprise, Port Leopold | — 10·44 |
| „ Resolute, Griffith Island | — 9·57 |
| „ Assistance, Northumberland Sound | — 10·03 |
| Mean | — 9·780 |

This result is truly amusing to me ; and to those who do not enter into such discussions, the *cui bono* wet blankets on every scientific discussion beyond their horizon, I would anticipate the question—What do you learn from this ? To my mind, much of importance as regards hope ; definite orders for my officers, and some diminution of anxiety for those I send forth. Taking the comparison resulting from this season’s registry, I find, that we have yet to expect —14·56° more cold before the 1st of June, in order to compensate, or equal, that experienced during the last season ; and day by day as this is swept away, so will my confidence in my intended measures be strengthened.

February 5.—The weather still remains fine, but the temperature still clinging to -40° . Yesterday, under a change of wind to the northward, a point from which it seldom blows, we experienced a fall of snow, the temperature dropping, contrary to rule, as low as -50° ; this was succeeded by calm and a rise to -40° .

After prayers today the bodies of our two men were interred in the same grave, with the customary solemnities. I had already deferred it some days, in the hope of milder weather; indeed, in a great measure, to enable me to officiate in my proper place; but the superstitious feelings of the crew were at work, and I thought it better to stop talking and conclude the ceremony. The service was read by Commander Richards; indeed I suffered severely from the exposure, which sent me to bed with severe rheumatism, or, what I am more inclined to believe, an attack of jaundice.*

February 12.—Of late most anxiously have our people been looking for the sun. On the 9th the refracted image was reported to have been seen from the hill, and on the day following the lower limb was reported by Commander Richards from the same position. With the return of the sun, the breeze also seems to accompany it, having blown in heavy gusts from the south-west, and during its greatest force last night the temperature rose from -47° to -36° . I allude to this more particularly, as in former voyages the winds have prevailed from the north and west. We have seldom been visited by strong winds, and never from the north-east to north-west. It is also remarkable that at Beechey Island, when they

From this I did not recover for many weeks.

experience strong southerly gales on the southern side, where the 'North Star' winters, no such breeze appears to extend up Wellington Channel, or even into Union Bay!

The mean temperature of the last ten days affords the coldest, for the month, which I believe has been hitherto recorded, being ten degrees in excess of any experienced amongst Arctic navigators. When I give this as a record, I beg it to be understood as the corrected temperature of the mean of the ten best standard thermometers, supplied from the Observatories of Greenwich and Kew.

| | | |
|----------------------|-----------|---------|
| H.M.S. Hecla in 1820 | | 32·213° |
| „ „ 1824 | | 26·445 |
| „ Enterprise, 1849 | | 37·570 |
| „ Resolute, 1851 | | 32·675 |
| „ Assistance, 1853 | | 28·753 |
| „ „ 1854 | | 47·145 |

With reference to my own health, none but those immediately concerned may care to know that I suffered; but in cases similar to mine, and where the disease (I mean scurvy) assumes such protean forms, it may not prove uninteresting to the general reader to learn upon what slender threads life may depend. I have before remarked, in the cases of Harriss and Burnett, that I consider the mind to have been materially engaged; and it is still my *conviction* that had hope of immediate removal to England been at all feasible, the lives of both these men would have been saved. But as regards myself, although I had fully made up my mind to die and to rest from my labours in the Crystal Palace, I was determined that I would continue, so long as life en-

dured, to act up to the principle which I had ever maintained, not only in sickness but in all the concerns of professional life, "The man who gives way is lost." In this climate, and under the insidious undermining effects of close confinement, repeated inspiration of a vitiated atmosphere, absence of light, and, still more important, of the wonderful influence of the sun's rays, nothing but determination, and a thorough conviction of the paramount necessity of exertion, will sustain a man in sound health. How much more important then is it to the invalid, seeking almost reanimation!

Reduced as I am, and scarcely able to dress or wash myself, the effort to get out of a warm bed into an atmosphere of 37° required some degree of courage as well as endurance; but the reflection, that one day's indulgence might for ever cut off the power, supported me. Once up and dressed, notwithstanding appetite was wanting to assist in nourishing the body, still the occupation and excitement of the mind continued to afford its own peculiar and wonderful invigoration, for I have almost forgotten to state that, added to an almost hatred to food, I had little or no sleep, and had adopted a system of hourly visits to my cabin during the night.

The theoretical views of this year as to changes at peculiar dates have been somewhat shaken by an interval almost of eight days. I had anticipated a break in the season, or a cessation of cold, about the 13th of February. The temperature, it is true, is but -33° , and the old hands would lead us to believe that this is not too cold, and that even -40° would be bearable. It may be, for matter of boast; but for the feelings and well-

being of my crew it is my business to arrange. I have therefore deferred the starting date to the 20th or 21st, and have also determined to entrust the direction of the sledge force to Commander Richards. Upon the question of "orders" I am particularly sensitive. To my mind they are the touchstone of command. It can only be compared with the horse and its rider: the determination and ability of the latter is conveyed almost instinctively by the rein. The man who issues an order, withdraws it, and then issues the counterpart of the first diminished in vigour, must be an object of ridicule. With me at present I have two uncontrollable matters to deal with—the temperature and the constitutions of my men. To this is opposed the eager spirit of ardent, indomitable courage, of men ready to obey more than I will venture to command. But with me rests the responsibility: success redounds to their credit, but failure reflects on my judgment and capability for command. Can any one in England feel and understand such an intensely exciting position? To send men into action, or lead them, requires no thought. Such deaths as would result are not inquired into,—they die with glory; we are only to be compared to the railway engineers, who are accountable for the loss of every life, even by accident or the visitation of Providence, and our dead, I fear, are ingloriously forgotten.

The absence of Commander Richards at this period will be most severely felt. Indeed the gradual diminution of officers, withdrawn by the successive sledges, will leave me without a companion beyond my kind professional attendant, Dr. Lyall, and Mr. Loney. This may

excite me to increased exertion; and after I once get sight of the invigorating rays of the sun, I feel that improvement must be rapid.

On the 19th of February the temperature varied a little, rising as high as -23° , but has again fallen to -40° , and during the week the range has been between -23° and -41° , mean 34.07° : the sun's rays have not as yet afforded any perceptible increase of temperature, nor do they at present contribute any "cheering light," being greatly impeded by a heavy, hazy, hanging atmosphere. We have just succeeded in fitting sashes into our winter housing, which, I am told, affords a very cheerful light to the quarter-deck, and enables invalids to enjoy exercise under a temperature of -22° , being 17° higher than exposed to the breeze outside, or, to the feelings, equal at least to 30° of *endurance*. Notwithstanding all that has been maintained about the travelling temperature of -40° being bearable, I hear less of it this year; indeed I am inclined to think that the estimate has, by common consent, and common sense, fallen to -30° ; and even *that* is viewed with some apprehension.

As the preparations were complete, and the parties told off for travelling were about to take their departure, a written address was read to the crews generally, approving, in strong terms, of their conduct last season, and expressing my full conviction that in the important duty on which they were proceeding, the same untiring energy and exemplary conduct would be manifested, and expressing a confident hope that my Lords Commissioners of the Admiralty would be pleased to reward those who had so greatly distinguished themselves.

About nine on the morning of the 22nd of February, yielding to the anxiety of Commander Richards to proceed to Beechey Island, in order to make due preparation from the materials available there for his expedition, and the temperature having risen to -35° , I determined to launch the 'Sir Edward' and 'Success' sledges, the former having seven and the latter eleven men, with Mr. Herbert, the Senior Mate, as his second. They were attended by all our spare population, and two sledge crews were specially told off to relieve them of half a day's labour at the drag-ropes, as well as to report upon the nature of the ice over which they travelled. This report was satisfactory; they parted from them four miles in advance, with a clear floe in view and the men in high spirits.

It is now incumbent on me to state what my plans were, and why I had selected Commander Richards to command this service, instead of, as I had before directed, Commander Pullen; and I feel fully satisfied that my readers will feel with me that until facts, or want of facts, bore more strongly on the possible fate of Captain Kellett's Division, it was not my province to issue orders which could indicate any contemplation of disaster. It must also be apparent to those who will refer to my parting with Commander Pullen, that I had only given him such instructions as would enable him to act if I did not form other views before the spring. From constant conversation during the winter, I saw the necessity of sending the next in command and next in seniority to Captain Kellett; I saw also the propriety of sending an officer to communicate, if possible, to him all my views

—in which he coincided—and to prevent any misconception of my orders, which naturally would become his guide, should any fatal accident have deprived that Division of Captain Kellett. The simplest-minded person would therefore perceive that Commander Richards, only, could fulfil all these duties. His instructions were as follow, and those for Captain Kellett were delivered to him unsealed, and intended to guide him until he met with that officer.

By CAPTAIN SIR EDWARD BELCHER, C.B., Commanding the Arctic Squadron.

Having selected you for the very important command of the Division connected with the western search from Beechey Island,

You will repair forthwith to the 'North Star,' where Commander Pullen has been instructed to afford you not only every possible assistance in your equipment, but also to accompany and receive from you his ultimate instructions, as in the enclosed packet, directed to him.

2. You will demand in writing all stores which you may require from his vessel, and he is required to man three sledges; commanded by himself, Lieutenant Cheyne, and his Mate or Second Master, or as to you may appear most advisable.

3. To Lieutenant Cheyne, independent of my special instructions to him, you will give the command at Cape Hotham, or, as circumstances may arise, either to him or Lieutenant May.

The post is important, and, without any regard to seniority or rank, it must be maintained by the most efficient you can select before you finally quit Cape Hotham on your return.

4. The sledge force from this ship will include six, with three from the 'North Star,' amounting in all to eighty-seven men, with 4030 rations, the distribution of which is set forth in the accompanying tables.

5. The period of starting from the 'North Star' must be governed by circumstances connected with temperature. Men who have to undergo the extended travel to which your crews will be subject must not be exposed to frost-bites, and I cannot perceive how they can safely take the floe before the termination of the first ten days of March.

6. It is a puzzling question to arrive at any precise period of parallel temperature. The guess of last year, although exact in every essential point, does not appear to conform this season to the general deduction resulting from the reports of my predecessors. Nevertheless, I will advise you to quit on the first decided rise of temperature after the 10th of March, and to nurse your crews from that date until the 23rd,* after which I consider absolute winter at an end and spring suddenly to commence.

7. Your first position will be on the east point of Assistance Bay, where Captain Kellett deposited 630 rations, less probably by 130 taken by the sledge crew which passed to the 'North Star;' 500 may therefore remain, to be examined by the relief parties following your traces.

8. Having reached this position, you will at once be able to discover whether the 'Intrepid' has been in the neighbourhood, or left any record of her movements or those of the 'Resolute.'

9. If any traces be there found, of course it will interfere, in some measure, with your westerly journey, unless the 'Intrepid' alone has progressed.

10. If the 'Intrepid' has left records of her easterly advance, then the orders to Commander Pullen, Lieutenants May and Cheyne, must be vigorously carried out.

11. Your precise duty is, to find Captain Kellett, to deliver to him the accompanying instructions, furnish him with every information he may require, and return to me with all possible despatch.

12. During your journey to the 'Resolute' you will *decide* on the most appropriate positions for depôts. At present the islands appear to furnish the most direct lines. But you must take into consideration that as spring advances they must become surrounded by water and access barred! It will therefore be incumbent on you to fix upon decided points where the crew of 'Investigator' or Captain Kellett may be *certain* of finding supplies without disturbing those especially set aside for the relief of our distressed countrymen.

13. Captain Kellett's second *cache* appears to be "about three miles west of Alison's Inlet," and at present probably consisting of 1000 rations. However, it is probable that Captain Kellett, being detained near this spot, landed the provisions. You will examine the

* This should be 31st, adding eight days for the later season. These orders were written in January.

spot, and if necessary, after releasing Lieutenant May at Cape Cockburn, desire him to leave instructions for its removal to Cape Cockburn.

14. All the dépôts for the return parties should be on the mainland, so as not to involve any water risk.

15. Captain Kellett will of course make good the dépôts for any who may follow up his track to Cape Cockburn. To that point I shall direct our main supplies to be pushed.

16. On your outward route it will very much conduce to the comfort of the travellers, as well as to their speed, if you designate four distinct points between Cape Cockburn and Assistance Bay as *caches*, for you must consider them to be laden with documents, instruments, etc.; say, Cape Cockburn, Frazer Point, Cape Rosse, and the eastern point of Assistance Bay. These will *ensure* safe in-shore travelling, "even if the water makes."

17. On reaching Cape Cockburn on your return you will give such directions to any officers, commanding sledges, as may appear to you likely to aid the advance of the weak or invalids, either of 'Investigator' or 'Resolute.' If it be possible, I think that one large sledge with provisions up to Byam Martin Island might be very grateful to the retreating crews. But these remarks apply more directly to the sick and feeble, particularly to the crew of the 'Investigator.' They must form the First Division.

18. The Second will of necessity have to remain until the final necessary duties have been completed; and as they will advance, forming *caches*, up to Byam Martin Island, you will assure them of all necessary supplies from Cape Cockburn easterly.

19. I now arrive at a more difficult question;—that is, the probability of finding, before you reach Cape Cockburn, information of the movement of Captain Kellett last season, and of the unaccountable non-appearance of 'Intrepid.'

20. My general measures have been adapted to meet this peculiar matter. Commander Pullen is instructed to cross the Channel to Cape Bunny, and to move on to Port Leopold.

21. You will then have to select such a route as will deviate completely from that pursued by him, taking probably that intended for Lieutenant May; and you will give him one over a *deviating line*, but *ensuring* the visits of two or more officers to Cape Bunny, where I intend to establish the southern turning-post, and divert any travellers from Captain Collinson to Beechey Island, instead of the misery they must inevitably encounter at Port Leopold.

22. In this latter part of your Instructions you will have to bear in mind that you are seeking persons, in all probability, in want of sustenance; and therefore no question of "expeditious travelling" must be suffered to interfere with the full load of provision which may be available; and you must also bear in mind my object of placing on Cape Bunny, on the eastern side of Peel's Straits, a large *cache*, in the event of Captain Collinson coming up that Channel or calling at Cape Walker on a northern march. Especial sealed notices will be supplied for that branch of the Searching Division.

23. By the accompanying table you will understand my final arrangements, by which the entire southern lines will be traversed by Commander Pullen, Lieutenant May, and possibly by Lieutenant Cheyne.

24. Your provisions have been increased in bread and meat, under the conviction that on this second season men should eat all that appetite can render salubrious. Indeed, it must be excited by herbs and other adjuncts supplied. I cannot therefore urge more than the preservation of all which is not consumed.

25. This does not apply to spirits; my own experience satisfies me that the men are enervated even by their present allowance, and, immediately after it is drunk, are not fit for undue exertion. It is possible that it may not injure them before sleeping, but its entire loss would not grieve me.

26. I now arrive at a subject which I would wish to avoid; but the duty I have to perform renders it imperative. I have to report "*instantly*" my proceedings. Under my former orders, unfortunately those of my predecessor, I enjoined journals "*within a reasonable period*" after return. In some few cases they were sent in. But that order, or rather request (for it has not been responded to as an order), I shall supersede. The custom of the service requires, copy of track-chart and report of proceedings. This will enable me to execute my duty; and I decline receiving any further journals, for which I shall have full reasons to give to my superiors, should they require them.

27. You will therefore on your return furnish me, within forty-eight working hours, with your report of proceedings, track-chart, or the one you made use of, and explain verbally any matters I may not then ask for in writing. But your journal of proceedings you will prepare for their Lordships. With matter concocted on board I have nothing to do: it belongs to your private journal. The idea of waiting *three months* for a report of proceedings is too absurd, unless where daily verbal explanation has put me *au courant* with all that I required.

28. You are furnished with copies of my former orders to Captain Kellett, as well as to Commander Pullen, by which you will be guided when not met by these Instructions. You have also my final Instructions of this date to Captain Kellett. These cannot be sealed at present, as they must in some degree guide you; but you will consider them as *confidentially* open to you, and seal them before you deliver them to Captain Kellett.

29. My general orders respecting notices and cairns you will carry out, and without reasons to be explained, those relating to commands of sledges will of course be observed.

30. You will, in the full spirit of the Instructions, draw up, during your detention at the 'North Star,' such further hints for the officer left in command as may prevent any misconception of the duties intended. I will further send especial orders by the next Division as to the second journeys of the sledges to Assistance Bay.

31. Every possible facility has been afforded to you for the most perfect equipment of the sledges placed under your direction; and having full confidence in you, and that your energy will be fully adequate to the arduous service entrusted to your command, I now commend you and your gallant companions to the care of the Great Disposer of events, praying earnestly that your return in safety may be attended with the welcome intelligence of the well-being of Captain Kellett's Division.

*Given under my hand on board Her Majesty's
Ship Assistance, this 15th day of February,
1854, in the Wellington Channel.*

EDWARD BELCHER.

To COMMANDER RICHARDS, *H.M.S. Assistance.*

It was not my intention to have troubled my readers with the specific Instructions to Captain Kellett, but events immediately succeeding render it almost imperative.

The original, penned on the 15th of October, 1853, I had considered undeniably distinct, and, had Commander Richards, by demise, succeeded to the command, would inevitably have met with immediate obedience.

By SIR EDWARD BELCHER, *Kt., C.B., Captain of Her Majesty's Ship Assistance, and in Command of the Arctic Searching Squadron.*

In consequence of additional Instructions furnished to me by my Lords Commissioners of the Admiralty, it becomes my duty to forward to you certain directions for your guidance.

2. In the absence of any information of your movements since Commander Richards quitted you on the 8th of June, 1853, I must conclude, from your letter of that date, that you are at this moment at Melville Island;

3. Or have made the attempt to reach Beechey Island.

4. Further: the result of your spring searches after Sir John Franklin or Captain Collinson being unknown to me, I am reduced to the necessity of *assuming cases* on which to found Instructions.

5. The first and absorbing interest is the fate of the crews of the 'Erebus' and 'Terror.' Should any *reliable* traces have been discovered, you will of course adopt such decisive measures for following them up as appear requisite, apprising me with all despatch of every particular, and suggesting any matters which may enable me to afford you that vigorous support which such a discovery would infallibly call forth from the fine body of men engaged in this enterprise.

6. You would therefore direct the instant return of Commander Pullen,* so that I may be enabled to double the *caches* which I intend pushing forward this spring towards Cape Capel, in order that the main or midway depôt may be satisfactorily completed without, *if possible*, trenching on the necessary supplies for your parties seeking Beechey Island.

7. Of course the above contingency would entirely change the features of our Expedition, which would date *de novo* from the ensuing spring.

8. Under such circumstances, should the trace prove westerly, I should adopt measures for reinforcing the Western Division by the advance of a ship or steamer to Cape Capel, and forming a new depôt on Byam Martin Island, as well as one easterly, near Cape Hotham.

9. In order to meet any such possible case I have furnished Commander Pullen with a copy of these Instructions. He will himself carefully watch on his advance for any eligible position.

10. And distinct orders will be given to each officer in command of the Commissariat sledges to remain at, examine, and leave his *distinct*

Then charged with this duty.

report on the localities where *caches* may be formed, so that no delay may occur on the eastern route to be taken by returning parties.

11. Failing, however, in this most important feature of my Instructions, I must direct your attention to the next in interest,—the traces of Captain Collinson.

12. If you should discover that he had followed up the track of the 'Investigator,' and it appeared likely to you that he might seek Melville Island;

13. I would suggest to you the necessity of leaving the 'Resolute' there, or at a more advanced position, for his use, and coming on with the 'Intrepid' to the Half-way Dépôt near Cape Capel.

14. Of course Commander M'Clure will have left all the necessary information, *not only* at the 'Investigator,' but at every *available point or projection*, which may enable Captain Collinson, without risk, to reach the dépôt left by you at Melville Island.*

15. If, on the other hand, you should not discover any trace of Captain Collinson, you will adopt the necessary measures for completing the chain of *caches* up to the Half-way Dépôt, at, or near to, Cape Capel. And taking into consideration their Lordships' Instructions to me, you are at liberty to determine, on reaching that locality, whether you will leave the 'Resolute' or 'Intrepid' as a dépôt. *One must be left.*

16. You will be guided in the matter, "with or without a crew," with reference to volunteers, provisions, and the physical condition of those willing to remain. But you are clearly to understand my meaning:—that *only* in the event of your being in possession of *sufficiently reliable authority* that Captain Collinson is yet *absent and advancing* are you to leave a crew.

17. It is very clear to my mind that if Captain Collinson has not been *heard of, in time to inform me before next August*, from England, that no good can accrue by leaving a crew behind,—when we well know that they can, if necessary, be forwarded from Beechey Island fully in time to answer any useful purpose.

18. These matters disposed of, I must now revert to the equally important consideration of yourself, officers and crews, now detained by this untoward season. I have, it is true, no possible information to guide me as to whether you quitted Melville Island accompanied by

He did not prosecute the back search, as I imagined he would have done.

the 'Intrepid,' or whether you despatched the 'Intrepid' forward with the crew of the 'Investigator:' you may, indeed, have been entrapped as the 'Assistance' is.*

19. It is however of the *utmost importance*, and *must yield to every other consideration*, that the crew of the 'Investigator' be forwarded, independent of the uncertainty of open water last season. They must be at Beechey Island, *if possible, before* the middle of June.

20. In order to secure this desirable object, I shall superintend this duty in person, advancing not only sledges but boats to Cape Hotham, and adopt other measures for the retreat of *your entire parties*.

21. If the water should make early and release this ship and 'Pioneer,' one or both may be advanced to your support; but I much fear any release to this ship until the extreme of the season.

22. I shall myself repair to the 'North Star' and assume the direction of affairs there until the anticipated arrival and departure of the relief which will, in all probability, be afforded by their Lordships; for the fate of all, when Commander Inglefield departed, was problematical. His assumption that it was my intention to return to England this season is without foundation, and of this my despatch will inform their Lordships.

23. All will depend on the report of Commander Pullen: he is by me, knows my intentions fully, and will clear up any *doubts*.

24. Unless distinct and unmistakable evidence is adduced bearing on the traces of Sir John Franklin or Captain Collinson, you are to consider that you are hereby directed to rejoin me at Beechey Island with all possible despatch, subject only to the deviations in paragraphs 11, 13, and 14.

25. I think I have now relieved you from any possible doubts as to your mode of proceeding and the intentions of Her Majesty's Government.

26. You will forward to me every possible document by Commander Pullen which may enable me to inform their Lordships of our latest proceedings, and which may possibly be forwarded by me before any possibility exists of your rejoining me at Beechey Island.

27. I have been thus circumstantial in every point in order to free you from every possible misconception, and I have forwarded to you a copy of their Lordships' Instructions to me, in order that you may fully understand their wishes.

Too true.

28. Having done thus much, and relying fully on your well-tryed zeal and ability, I feel assured that *any deviation* will arise solely from circumstances over which *you have no control*.

29. And now, committing you to that merciful Disposer of events who has, on many occasions, interposed his powerful aid in our rescue, I fervently pray for the entire reunion of our at present disjointed Squadron in health, vigour, and prosperity.

*Given under my hand this 15th day of October,
1853, on board Her Majesty's Ship Assistance,
off Cape Osborn.*

EDWARD BELCHER.

To CAPTAIN HENRY KELLETT, C.B.,
H.M.S. Assistance.

As the appointment of Commander Richards to this service, and maturer thought, had very much confirmed me as to what the country expected from me, I added the following :—

[*Confidential.*]

*H.M.S. Assistance, off Cape Osborn,
February 1st, 1854.*

SIR,—In my former Instructions of October, I had not so well considered matters as at the present moment, and it occurs to me that I have not been so precise or urgent as the nature of their Lordships' intentions require.

We are not now left to our own feelings, our zeal, or our judgment, and we know not what may be the orders which will arrive in July or August; but I can *foresee** them, and it becomes my duty to meet them in the same spirit. Taking into consideration therefore that similar orders will be given respecting the next steamer, she cannot be retained beyond the 1st of September. Whatever powers may be left to me to await your extrication, I must send home every soul who is useless here, or whose death may result from that oozing out of fancied zeal which brought them here.

You must therefore read the 13th, 14th, 15th, 16th, and 17th paragraphs as definitive orders for *abandonment* to all who are not to stay

* I was right.