

"spend much of their time basking in the sun, and if the sun does not yield sufficient warmth, they scoop out a hole in the ground, burn in it branches and leaves of the maguey, and, when properly heated, lay themselves down in the place, and cover themselves with a mat or the loose earth" (p. 637).

Among the Zapotecs a very interesting art of divination prevailed, and to some extent is still practised. "When a woman was about to be confined, the relatives assembled in the hut, and commenced to draw on the floor figures of different animals, rubbing each one out as soon as it was completed. This operation continued till the moment of birth, and the figure that then remained sketched upon the ground was called the child's *tona*, or second self. When the child grew old enough, he procured the animal that represented him, and took care of it, as it was believed that health and existence were bound up with that of the animals; in fact, that the death of both would occur simultaneously" (p. 661). To conclude the list, among the tribes of North California, the development of the idea of current value, depending partly upon the utility and partly on the scarcity of the objects circulating, is most quaintly illustrated. Their wealth consists in shell-money, called *allicochick*, white deer-skins, canoes, and, indirectly, in women. The shell which is the regular circulating medium is white, hollow, about a quarter of an inch through, and from one to two inches in length. On its length depends its value. A gentleman, who writes from personal observation, says: "All of the older Indians have tattooed on their arms their standard of value. A piece of shell corresponding in length to one of the marks being worth five dollars 'Boston money,' the scale gradually increases until the highest mark is reached. For five perfect shells corresponding in length to this mark they will readily give one hundred dollars in gold or silver." White deer-skins are rare, and considered very valuable, the possession of one being even said to give a claim to chiefship. A scalp of the red-headed woodpecker is equivalent to about five dollars, and is extensively used as currency on the Klamath. Canoes are valued according to their size and finish. Wives, as they must be bought, are a sign of wealth, and the owner of many is respected accordingly (p. 347).

Our notice of Mr. Bancroft's first volume, consisting as it does merely of condensed accounts of the appearance and habits of wild tribes, is almost necessarily fragmentary. We look forward to the promised speedy publication of the remaining four volumes, of which the next will describe the more civilised nations of Mexico and Central America, the other three containing the comparison and discussion of the native languages, mythology, &c. When the whole work is completed, it may probably lead to the ethnology of American taking a new departure, and passing from its present chaotic condition into a more orderly and scientific state.

OUR BOOK SHELF

Quelques Nombres Caractéristiques relatifs à la Température de Bruxelles. Note de M. Ern. Quetelet, 6 pp.

THIS small tract briefly summarises the chief points of popular interest in the climate of Brussels relating to the

temperature. The following are the data tabulated which have been calculated from observations made during the forty years 1833-1872:—The mean temperature of the year, seasons, and months; the absolutely highest temperature of each summer, and lowest of each winter; the absolute maxima and minima of each day of the year during any of the forty years; and the mean temperature of every day of the year; together with some other points of interest, such as the degree to which the temperature has risen every summer and fallen every winter. Such tables, if worked out for other places at which the necessary observations have been made, could not fail to prove of great general utility to horticulturists and others, particularly those which show not only the mean temperature of any particular day of the year, but also the degree to which for that day the temperature has been known in the past to rise on the one hand and fall on the other.

Some interesting points appear in connection with the periods of unusually cold and warm weather which are known to occur in North-western Europe at different times of the year. Thus the cold weather of May is not only shown in the forty years' mean temperature of the days, but also in the absolute maximum temperatures which have been noted on the particular days during any of the forty years—the mean of these maxima of the five days from the 6th to the 10th May being $80^{\circ}3$, but of the five days from the 11th to the 16th only $77^{\circ}6$.

A Report of Microscopical and Physiological Researches into the Nature of the Agent or Agents producing Cholera. (Second Series.) By T. R. Lewis, M.B., and D. D. Cunningham, M.B. (Calcutta: Government Printing Office, 1874.)

MESSRS. Lewis and Cunningham are already well known for their minute and valuable researches on the agencies by means of which diseases are spread. The paper before us, which is one of the Appendices to the "Tenth Annual Report of the Sanitary Commissioner with the Government of India," is divided into three parts. Part I. is concerned with the microscopic examination of the blood, giving the results of such an examination in health, in cholera, and in diseases other than cholera; part II. describes the results of experiments on the introduction of choleraic and other organic fluids into the system; and Part III. gives an account of experiments on the section of the splanchnic and mesenteric nerves. In addition to a discussion of the results of the experiments, the details of the experiments themselves are carefully arranged in a number of tables throughout the work. While the experiments herein described are of high value from a practical medical point of view, they cannot fail to shed some light on the broader scientific question of the origin of Bacteria. From the latter point of view, those parts of the Report bearing on the question of the existence of living organisms in the tissues of healthy subjects after death, and also those portions referring to the effect of heat on morbid products, are of special importance. How do these organisms originate in the glandular and other tissues, and why don't they develop whilst the tissues are in a normal living state? We hope that in a future Report the authors will be able to present some data which will help towards a solution of these questions.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

Ocean Waves

IN reference to the letter in NATURE, vol. xi. p. 386, respecting the "Height of Waves," it may be noted that the data presented would give about 110 ft. for the height above the sea

underneath the observer, and the distance from crest to crest 1,125 ft., and so the one would be one-tenth of the other.

It may be suggested that such measurements would be more reliable if taken from a point above, on the tops or shrouds of the masts of a ship (*vide* Admiralty Manual, p. 94, for directions), so that one could just get a view of the upper horizontal level, so as to see the crests of the other waves advancing.

This computation of wave height much exceeds previous recorded observations by double the amount, so that there may be some error in apprehension, or in statement of the account, or in the calculation.

Dr. Scoresby's observations in the North Atlantic record 24 ft., 30 ft., the highest 43 ft., and the mean 18 ft., in westerly gales; and the frigate *Novara*, 20 to 30 ft. off the Cape Promontory.

French observers in the Bay of Biscay state a height of wave of 36 ft.; Capt. Wilkes, U.S.N., writes of 32 ft. in the Pacific, and Sir J. Ross of 22 ft. in the South Atlantic.

Heights of waves in N.W. gales off the Cape of Good Hope were computed at 40 ft., those off Cape Horn at 32 ft., in the Mediterranean seas at 14 ft. 10 in., and in the German Ocean at 13½ ft., but in British waters they are only found to average 8 to 9 ft.

The velocity of ocean storm waves was observed by Dr. Scoresby in the North Atlantic to be about 32 miles per hour; Capt. Wilkes recorded it at 26½ miles in the Pacific, and French sailors in the Bay of Biscay at 60 miles an hour; and I have noted it myself in the South Indian Ocean at 22½ miles an hour in the great westerly swell after gales.

Further, Dr. Scoresby has estimated the distance between or breadth of his Atlantic storm waves at about 600 ft. from crest to crest, which is only about half of that stated in the letter, and with a proportion of only $\frac{1}{10}$ for height to breadth. (*Vide*

Report, British Association, 1850.) Dr. Scoresby states that his waves of 30 ft. in height move at the rate of 32 miles per hour, which hardly accords with the observers of 110 ft. in height, with 25 miles per hour of motion. It would be very desirable that more data should be got on storm waves, for here is another discrepancy of proportion of length to breadth of $\frac{1}{10}$ to $\frac{1}{20}$, which cannot be surely common or correct.

The accompanying diagram is constructed according to Dr. Scoresby's scale of measurements, 600 ft. breadth, 30 ft. height, and 220 ft. vessel, with rates of wind, wave, and vessel, and from it one may ponder on what small dimensions these terrific looking waves are constructed, and that a ship after all looks only like a cork or chip on the great seas.

The account of the peculiarities of storm seas, also therein mentioned, from the S.W. and N.W. directions in the Atlantic, may be extended to the effects of other winds elsewhere on the ocean surface.

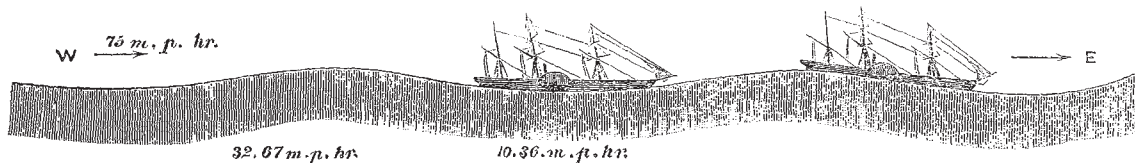
North-east gales in the North Atlantic, and south-east ones in the South Atlantic, appear to have similar effects on the seas and vessels exposed to them.

The waves raised are short, brisk, feathery, and clear, and make a peculiar rushing din, and they do not cause a ship to plunge so much as to roll, and are not accompanied by wet so much as by dry weather.

They are generally not dangerous to navigation in the open sea, as they carry light, clear, swift driving clouds, which do not obstruct marine observations or a view of the horizon all round.

On the other hand, the north-west gales in both hemispheres are attended by heavy, dark, rolling waves of huge bulk, momentum, length, and breadth, up which a ship is driven like up a hill-side, and down which it scuds as into a valley.

Here the vessel plunges more than she rolls, and is subject to



lurches on one side or other, and labours much in consequence of the wetness of the sails and rigging, increasing the weight of the top hamper and its hold by the gales.

These winds are more dangerous to navigation, as they are accompanied by thick heavy clouds lying low in the atmosphere, and shedding much rain and obstructing the view of the horizon all round, and so prevent marine observations by day or by night.

The grand westerly gales of the northern hemisphere, seen on the passage to and from America, occur amongst the latitudes of the counter trades, and are reciprocated by the similar belt in the southern hemisphere below 40° latitude, and are called by Maury the "brave west winds."

This region is traversed by the Australian and New Zealand liners, south of the Cape, and the voyages along this tract are as exciting as a race, and the ship is in much the same predicament as the man in the song with a steam leg.

As much sail as can be safely and possibly carried is spread, as speed is a vital necessity in order to keep the canvas and rigging from being blown away, and to prevent the ship being pooped by a following wave.

The frail bark then boldly scuds along before the wind, down one mountain wave and up another, with cordage creaking and masts bending, as fearless as the wild albatross following in its wake, or the gay porpoise careering in its front.

The difference to the passenger between these two classes of winds seems mainly to depend upon their wetness or dryness, so that the rainy weather adds to the discomfort of the one and the clearer weather in the other gives him some consolation in the storm.

The ship itself would no doubt have a preference, while in the one case its canvas and cordage are soaked with water and its decks deluged or sloppy; in the other its rigging is allowed to retain its natural trim, or even to get slackened by over-dryness, and the decks remain comparatively dry.

As to the waves themselves, it still remains to be explained why they should be greater with winds laden with rain than with dry winds, in the open sea and far away from land, unless the weight of the atmosphere above them should be allowed to count, as the barometer runs higher of course in the north and south easterly winds than in the north or south westerly gales.

Admitting there might be a difference in certain instances, even over the same tract of latitude, of one inch in the height of the mercury in the barometer between westerly and easterly gales, we may find on calculation that this would make a difference of 896,091 tons of weight of the superincumbent atmosphere on the surface of a square mile of the sea. This difference of atmospheric pressure would cause or allow a greater mobility to impression by the winds in the seas outside the tropics and under low barometric indication anywhere, and also a tendency in them to flow in towards these regions, and into storm tracts, as is narrated in accounts of cyclones, where great floods are sometimes produced.

The movements of the ocean swells after gales, it may be hazarded, might be accelerated by the tendency of the disturbed equilibrium to restore itself in the efflux of the seas from the storm region to calmer exteriors.

There might therefore appear to be as much movement and commotion in the waters below as there are in the atmosphere above, in all disturbances of the equilibrium mutually arranged between these two fluid coverings to the surface of the earth.

Edinburgh

J. W. BLACK

Walker's System of Geometrical Conics

It is remarked in *NATURE*, vol. xi. p. 404, that Walker's "generating" circle appears to have dropped out of recent textbooks; but I may be allowed to add to the statement of your reviewer that Walker's method was revived in the *Messenger of Mathematics*, vol. ii. p. 97. I had been acquainted with his