

In conclusion, we would take exception to the references (pp. 28 and 74) to the suppressed aortic arches of the embryo and to the mode of development of the nervous axis, unless their introduction bears upon the lecture scheme adopted at the Victoria University. If so, well and good, but if not, we are of opinion that such supplemental statements should be inserted, in a book of this kind, as footnotes or their equivalents. It is sufficient that the beginner should realise that three pairs of aortic arches exist in the adult, alone under consideration.

OUR BOOK SHELF

Methods of Research in Microscopical Anatomy and Embryology. By C. O. Whitman, M.A., Ph.D. (Boston: S. E. Cassino and Co.; London: Trübner and Co. 1885.)

WITHIN the last few years a number of new methods have been suggested for use in microscopical, and more particularly embryological, research, and a glance at almost any one of the recent memoirs on these subjects will serve to show how much is due to the employment of new methods. It is, however, extremely important not to lose sight of the fact that complicated methods are exceedingly likely to produce false or misleading appearances. To carry on successfully any microscopical research it will probably be necessary to invent new methods or at any rate modify old ones to suit the exigencies of the case. To do this an acquaintance with the methods which have been used by previous observers is necessary, and in addition a clear idea of such general principles as it is possible to formulate with regard to the action of various classes of reagents upon various tissues.

A great number of the new methods have been described, and this often in a few words only, in special memoirs, so that they are often overlooked.

"Hitherto," says the author of the work before us, "most of our standard books of reference on methods have been rather complex in character, dealing with the microscope and technical methods as subordinate and introductory to the main subject of histology."

With regard to certain special methods there appears unfortunately to be a reluctance on the part of their inventors to reveal what they thus make a sort of trade secret, "withholding it on the ground that others are not entitled to the advantages of your experience." Dr. Whitman in his present work has sifted the numerous methods which have been suggested, and has given histologists the benefit of his great practical experience in rejecting some while recommending others; he has also endeavoured to formulate as many general principles as possible, though of course there is more to be done in this respect, our knowledge being at present insufficient to generalise to any great extent.

We notice with regret a slight tendency in the work before us as well as certain histological schools to neglect almost entirely the older and simpler methods of cutting sections. Serial section-cutting is now such an important item in all morphological work that it is apt to be used to the exclusion of older methods, which give in many cases undoubtedly better histological results.

Dr. Whitman has also collected a large number of most important observations with regard to the best method, time, and place of obtaining material; these are of course very incomplete, but it is to be hoped that he will see his way towards continuing them, and that others will follow his excellent example.

Alternating Currents of Electricity. By Thomas H. Blakesley, M.A. "Electrician Series." (London: Published at the Office of the *Electrician*, 1885.)

THIS is a very unsatisfactory little book; indeed it is difficult to find anything favourable to say of it, except that

it is concerned with a subject which is of considerable importance, and which might be treated in an interesting and instructive manner. It is a reprint of papers, originally published in the *Electrician*, on Alternating Currents of Electricity, and professes to deal with various problems connected with them by geometrical methods. But the methods are long and intricate, and the work is not well done;—carelessly written and printed in the beginning, the style remains unchanged. The errors in form are numerous, the figures are not good, and geometry and algebra are mixed up in formulas in the most puzzling and irritating way. We find commas between the factors of products (all through pp. 11, 12, 13), and diagrams in which the letters are illegible in several places. In one investigation covering three or four pages, we have the letter *C* used for capacity of a condenser, for electric current, for the sum of a series of cosines, and for designating points in the diagrams. In fact the whole book is full of confusion, and is a model of what mathematical writing ought not to be; while we cannot imagine that it will prove useful or even intelligible to the telegraph engineers for whose benefit we may suppose it was put together.

J. T. B.

Third Annual Report of the New York Agricultural Experiment Station, for the Year 1884. (Albany, N.Y.: Weed, Parsons, and Co.)

THIS Experiment Station was established by an Act of Legislature passed in 1880, and amended in 1881. The management is intrusted to a Board of Trustees, who appoint a director, horticulturist, botanist, chemist, stenographer, farmer, and assistants. Such an organisation must be considered as a step in advance beyond anything yet done in this country, being a direct action on the part of the Government to promote the exact knowledge of agriculture. This is the main point we desire to bring before the readers of *NATURE*. Among the many voices raised on behalf of technical instruction of artisans and others engaged in industrial pursuits, or of musicians and artists, few are to be heard in favour of the promotion of exact agricultural knowledge. The Americans are wiser, and are establishing what they call "experiment stations" in various parts of their wide territory. A few of the objects of investigation at present occupying the attention of the staff of the New York Station may be enumerated as follows:—(1) Fertiliser analysis; (2) sample orchards containing single trees of each known variety; (3) soil temperatures at various depths; (4) digestibility of various foods; (5) germination of commercial seed; (6) a study of maize; (7) root-distribution by root-washings; (8) milk; (9) diseases of plants. These sections furnish material for 418 pages, abounding in tables of results of great practical value. The pains taken in thoroughly working out the conditions of milk-production in the case of two cows, "Meg" and "Gem," are evidence of great activity and zeal. The weight of the cows was taken daily from September 17 to November 12. The weight of food consumed, the accurate analysis of the food, the daily weight of solid and liquid excrements, the daily yield of milk, the daily analysis of the milk,—all this carefully and punctually recorded, and fixed in tables, is a work of great importance, not only as bearing directly upon dairying, but having likewise a physiological value. Such constant daily observations are not only essential, if the experiment is to be of any practical value, but must be beyond the efforts of practical farmers, who really ought not to undertake such investigations. But the value to the community at large when such experiments are conducted quietly and regularly by persons specially set apart and paid to carry them out cannot be overrated. They must not be attempted by ordinary dairymen in ordinary stalls, and with ordinary business appliances, but can only be carried out by trained hands, in specially constructed stalls and with special arrangements, all of which must

be carried out at a *loss*, which loss is the reason for an endowment. It is hard to say whether the perusal of such a Report as now lies before us impresses most with admiration for American activity or regret for English supineness.

JOHN WRIGHTSON

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.]
- [The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Major Greely on Ice, &c.

IN the long and interesting address of Major Greely at the special meeting of the Royal Geographical Society, held ten days ago, with the object of hearing an account of some of his proceedings during his painfully memorable Arctic expedition, the traveller dwelt so largely upon the conditions of the ice on the open Polar sea, &c., that one was led to believe that he was talking at opinions—spoken or written—by some one adverse to his own; possibly those given by myself in the communication published in *NATURE* of December 10 last may have been meant. Should this be so, anything that Major Greely has said does not in the slightest degree affect the statements made by me in the above-mentioned letter.

Major Greely tells us that Hayes, as well as *Kane* (it should be *Morton*), saw "an open Polar basin." Payer, in as high or a higher latitude at Franz Josef Land, saw, at a much earlier date in spring than Hayes and Morton did, a larger pool of open water, with "myriads" of water-fowl, but did not think of calling it an "open Polar basin," or part of one.

This idea of a great open Polar sea is almost, if not wholly, confined to our American cousins, where it seems to have taken firm root for at least thirty years past, and has, I should imagine, a spiritualistic origin, for Dr. Kane was a believer in spiritualism.

With the fear of appearing tedious, I shall quote briefly the perfect meaning, if not the exact words, of part of a letter which a distinguished spiritualist, Major —, sent to me prior to one of my Arctic expeditions. In this letter I was told that Franklin was still alive (clear proof had been obtained that he had been dead some years before the date of a *part* of this letter), and was residing at 132 (?), St Peter Street, in a seaport town called Joppa, having a population of more than 100,000 persons, on one of the lands near the Pole!

There was a large population, the Government Republican, and a fine, healthy, and salubrious climate. "These people were descendants of one of the lost tribes of Israel!"

The postscript was curious, and written at a later date than the letter itself, immediately after the death of Dr. Kane, as follows:—"Have just had communication with the spirit of Dr. Kane, whose first visit after death was paid to Franklin in Joppa, where he was still alive and well, but praying to get home."

Major Greely seems to confound two forms of ice having very different origins—namely, the floeberg, of which I have already said enough elsewhere, and the freshwater-ice, which, he says, is derived from the ice-caps of far northern lands, a mass of which he saw, having very considerable extent and "a thickness of one-sixth of a mile! with a deep valley containing a number of boulders."

This great mass of ice, 880 feet thick, with valley and rounded stones, may have been readily formed on the shores of one of the high headlands—one of which is named as having an altitude of nearly 3000 feet—along the northern portions of which Lieut. Lockwood skirted during his sledge journey on the coast of Greenland.

True, I was never in these high latitudes, but a person may sometimes be permitted to reason from analogy, as I shall attempt to do.

In 1848 I saw on the northern shore of America, in lat. 68° 40', not far from the Coppermine River, a snowdrift against a cliff about 100 feet high, and in 1849 I and my party were detained at the same place for a good many days, during which we had ample time and opportunity to examine this snowdrift,

nearly all of which was converted into ice that seemed permanent, except when parts broke off and floated away.

The slope of this snowdrift tapered towards the sea with so gentle a descent that our boat was easily hauled upon it to protect it from the ice-pack, and we with great facility carried our baggage up the ascent, and pitched our tent on the top of the cliff. A part of this snow-drift ice had broken off and drifted away, showing a very distinct stratified section, similar to that described by Dr. Moss and Major Greely.

The height of this section above sea-level was only, as far as I can remember, about 10 or 12 feet, for the water is shallow on this coast,¹ but, if Major Greely's measurements are correct, the

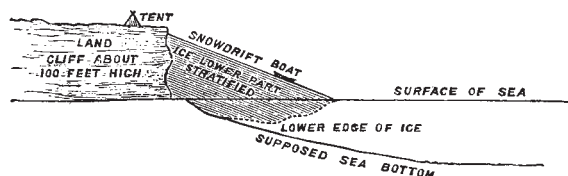


FIG. 1.—Actually seen by J. Rae in 1849, at a headland north of Coppermine River, lat. 68° 40'.

water close to the Greenland shore must be pretty deep—at least 100 fathoms—so as to float ice one-sixth of a mile thick.

My contention is that, if in latitude 69° a drift-bank of snow and ice is kept up from year to year against a cliff 100 feet high, the same thing may take place in latitude 82° to a far larger extent, where the shore is 2000 feet high, steep or precipitous, and the sea deep, so that masses of ice 800 or 900 feet thick may break off and float away.

That such great sloping snowdrifts do occur on the northern Greenland coast was proved by the difficulty met with by one of the officers of the English Expedition in travelling along them in 1876 with sledges, being forced to do so in many places by the rough ice outside, which stopped the way along the level floe.

As regards boulders, they are to be found of various sizes, more or less numerous, almost everywhere on Arctic lands high above the present sea-level, and they might have been transported to the "valley" spoken of by Greely in other ways than that supposed by him. They may have been moved downwards very slowly, by the alternate freezings and thaws of the snow and ice round them, by storms and snowdrifts, then down the slope of the valley to its lowest level, or they may have been carried by one of those streams of water similar to that mentioned as running down over the snow-caps of Grant Land. In fact, all that is wanted for this purpose would be two high,

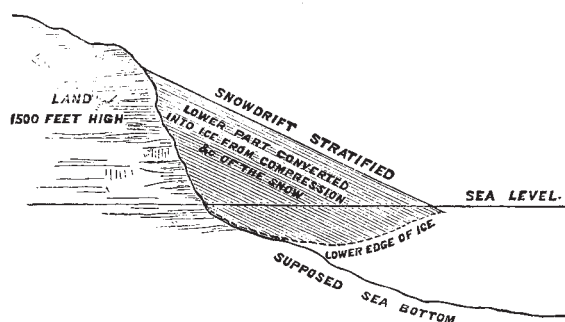


FIG. 2.—Supposed headland on the northern part of Greenland, about 1500 feet high. Greely says these headlands (or one of them) are nearly 3000 feet, having a northern or north-eastern aspect.

steep bluffs, with a deep narrow ravine between. The bluffs would give the thick masses of snow and ice-drift, and the ravine might form the bed of a stream carrying stones into the valley.

Neither Dr. Moss nor Major Greely, as far as I have noticed, have accounted for the very distinct stratification seen in the form of ice described. In all parts of Arctic America where I have been, a fall of snow is usually either accompanied or followed by a gale of wind more or less strong, chiefly from one

¹ In the very rough sketch sent, the water is made to appear much too deep; in fact, there is no pretence at correct proportion of heights and distances.—J. R.