aneroid fell 0·49 inch, the temperature was again found to be 98°·3; pulse, 116; time, 10h. 42m. Twenty-three minutes later, after rapid walking (barometer 0·48 inch lower than previous reading) the observations were: First minute, 96°·3; second, 97°·4; third, 97°·6; fourth, 97°·7; fifth, 97°·8; pulse, 116. At 12h. 4m., after continuous walking at a good speed, the observations were: First minute, 94°·2; second, 96°·2; third, 97°·4; fourth, 97°·8; fifth, 98°·1; pulse, 128. The pace was now quickened almost to exhaustion, and at 2·30 P.M., when greatly fatigued, the observations were: First minute, 93°·9; second, 95°·6; third, 96°·8; fourth, 97°·4; fifth, 98°·0; pulse, 90. These last observations were made with some difficulty, and under such circumstances that I am disposed to attach less weight to them than to the former readings. My exhaustion was doubtless partly due to hunger, for I purposely fasted in order to test the correctness of Lortet's statement that the fall in temperature is specially marked during an ascent made when hungry.

These observations were all I could obtain, as I was too much fatigued to carry on the work. They are scarcely numerous enough to enable any very definite conclusions to be drawn; but so far as they go, they certainly are not confirmatory of the conclusions arrived at by Drs. Marcet and Lortet; they at least prove that if any decrement does occur during climbing, it is never so great as 8° (Lortet), or even as much as 3° (Marcet).

It may be thought that the low readings obtained in the later observations on first placing the thermometer in the mouth, are indicative of a decrease in body-temperature. It must be borne in mind, however, that, especially in the later observations, we were facing a keen wind sweeping down a mountain partially covered with snow; it is perfectly obvious from this cause that the first minute's observations can afford no reliable indication of the temperature of the mouth, or otherwise the body must recover its normal temperature with a rapidity which would be perfectly extraordinary. From repeated trials made on myself and others, I have come to the conclusion that observations of the temperature of the mouth taken even after the end of the second minute give no trustworthy indication of the temperature of the body; such indications are of no value even as comparative measurements.

As it seems quite certain that any variation which may occur is a matter of tenths and not of whole degrees, it may be well to point out a source of error in the method of observation which seems to have escaped the attention of observers hitherto, but which in any case is too considerable to be neglected, although it would specially affect the results obtained at high altitudes. In taking the temperature of the mouth on a mountain, surrounded by a rapidly moving atmosphere at a temperature often but little higher than that of melting snow, it is obvious that the mean temperature of the mercurial column must be considerably lower than that of the mouth, since the greater portion of the stem is in the cold air. The correction to be added to the readings is readily calculated if we know the length of the exposed column, its mean temperature, and the apparent expansion of mercury in glass. If we suppose the length of the exposed column in the observation taken at 2.30 P.M. to be forty times the length of a degree, and its mean temperature that of melting snow, the correction to be added to the last reading would amount to a quarter of a degree.

The whole subject unquestionably merits reinvestigation. A much larger number of observations is needed; these should be made under similar circumstances on different persons, for it may well happen that the bodily idiosyncrasy of the individual may affect the result. Possibly some Alpine party may undertake the solution of the problem during the present season. It is doubtless not so simple as it may at first sight appear. From my experience during the ascent of Etna, and from what I have been able to glean of the manner in which other observations have been made, it seems clear that the conditions necessary to obtain perfectly comparable results have yet to be determined. Should any variation be observed, either in the direction observed by Drs. Marcet and Lortet or in that indicated by the experiments of Dr. Forel, it would be specially interesting to determine how quickly the human body recovered its normal temperature on resting.

T. E. THORPE

Arctic Marine Vegetation

IN NATURE, vol. xii. p. 55, an interesting article on the Arctic marine vegetation, quotes Ruprecht (with doubt as to his accuracy) in regard to an asserted absence of Algæ in Behring Sea and the waters north of it.

That doubt is well founded, as I can testify, having been engaged during a large part of ten years in explorations of that region. The line of the Aleutian Islands from east to west is girt with seaweeds, which are quite as abundant on the north as on the south side of this archipelago. If Ruprecht, however, referred to the waters still further north, he is equally in error. Unfortunately I am not possessed of much more botanical knowledge than comes from collecting for my botanical friends, and to them I must leave the task of enumerating the species, but perhaps a few remarks on the general distribution of the Algæ of this region may not be without interest. It is noteworthy that fine and beautiful seaweeds, such as are used for ornamental albums, are comparatively quite rare on the whole coast, from the Vancouver Archipelago north and west. Rhodosperms are particularly scarce in individuals, though how far this may be true of species I am not competent to say. Chlorosperms are confined to a very small number of forms, also rare as individuals. The great mass of the algoid vegetation of this region is made up of Melanospermæ.

Some forms which I believe are closely related to if not identical with *Fucus vesiculosus*, are found in masses on the rocky shores of Behring Sea, from the Aleutian Islands north to Behring Strait, and I do not know how far beyond.

The distribution of the Algæ seems to be largely dependent upon the character of the rocks. Basaltic shores are least rich and afford few forms, except what I have called *F. vesiculosus*, and species of *Agarum*. Granitoid rocks and Tertiary sandstones and conglomerates always afford at least a few forms of red and green seaweeds, while on the metamorphic slates and porphyritic rocks, which make up the greater part of the Aleutian chain, the *Nereocystis*, *Laminaria*, *Nullipores*, and *Agarum* seem to find their most congenial home. The character of Behring Sea is unfavourable for the growth of seaweeds. Much of the eastern plateau is of soft sticky mud or fine clean black volcanic sand, affording no hold for Algæ. But wherever there are rocks Algæ may be found, though the more delicate kinds are always rare. Jointed and incrusting stony Algæ are abundant on most of the Aleutians, and I have noticed them also at the Pribiloff group, Nunivak, Norton Sound, and Plover Bay in East Siberia, though less common northward.

The "bull-head kelp" (Nereocystis?) is excessively abundant in the Aleutians, and extends north to Nunivak and the Pribiloff Islands. There is a patch of twenty-five square miles in extent, north-east of St. George Island, on a shoal in the open sea. I do not recollect its occurrence further north than Nunivak. *Laminaria* extends to the Straits, and possibly north of them, with *Agarum*, the two most abundant seaweeds of Behring Sea. *F. vesiculosus* everywhere where there are rocks; also a flat, leathery, thick-fronded alga with short stalks, which the sailors call "devil's aprons." These have the edges variously cut or indented, though some forms are oval, with two thickened marginal bands extending outward from the stalk. In Norton Sound, in 1865–66 and 1867, I obtained what seemed to me to be at least fifteen or twenty species of algæ, which included something that I could not distinguish from the "Iceland moss" of the coasts of New England, and which was not found further south. In many places where the bottom was unfavourable for algæ I have found dead shells and living crustacea entirely hidden under a growth of red and green algæ, which, without exercising great care, would often have led to the rejection of valuable specimens of invertebrates from the dredge, from their being taken for mere bundles of seaweed.

I may also mention that in the hot springs (110°–180° F.) which exist on the peninsula of Alaska and many of the islands, there is invariably a leathery brown algoid, covering the bottom of the basins in which the springs occur. *Nostoc* also flourishes in the fresh waters emptying into Norton Sound. I have many times noticed the *F. vesiculosus* apparently flourishing in lagoons where the water was barely brackish to the taste, and to which the sea had no access except in extraordinary storms such as might occur once or twice in a year.

Much of the above may be without interest to the scientific botanist; I leave it to your judgment what to reject, but I think that there is no further necessity for disproving the error into which Ruprecht has in some way been led; certainly, if he had himself walked the beaches of Behring Sea, where any rocks exist, he could not have come to such a conclusion.

WM. H. DALL

Smithsonian Institution, Washington, D.C., U.S., June 10