tion. What is vastly more important, it would rouse an enthusiasm for science at the locality of the meeting, which, if rightly fostered, would give permanent results.

The association has sought to meet some of these wants and difficulties by creating a larger number of sections, each of which has a presiding officer, who is expected to deliver a formal address. This is an advance, but only a half-way measure. The papers increase in number every year; and the several sections must all work at once and arduously to finish their reading in the allotted time. To many a member, even to a specialist who may be engaged in two distinct lines of research, comes the disappointment of missing the hearing of valuable papers when two or three are delivered simultaneously.

Many of these features must appear prominently at the present meeting. The attendance will consist in greater proportion than usual of the popular element. The membership is now so large that there is no risk of the meeting being insignificant in size, as at Dubuque in 1872. But, since Minneapolis is the farthest point to the west yet tried, its distance must withhold many familiar faces. After this, we shall know better whether the kind invitations of San Francisco may be accepted two or three years hence. Next year the meeting should not be too far from the British association at Montreal.

At least eight addresses will be given by presidents of sections, — excellent in their kind, but not quite a substitute for thoughts that breathe and words that burn. If free and wide discussion could be encouraged at these meetings, the retiring president's address would now give abundant occasion. Dr. Dawson hits hard where he thinks he sees a crevice in the armor of the evolutionists or of the glacialists, and many will chafe if there is no immediate opportunity to return his thrusts. But, while it may fail of excitement, the meeting at Minneapolis is very enjoyable. The city and vicinity are picturesque and delightful. The hospitality of the west is as broad as its prairies W. C. W.

THE IGLOO OF THE INNUIT. — I.

The Esquimaux of the arctic regions of North America call themselves 'Innuits,' and their winter-houses, built of ice and snow, 'igloos.' This short explanation may be needed to make clear my somewhat obscure title.

These strange huts have been incidentally described by many travellers in the accounts of their arctic explorations. But beyond the fact that they are rude domes of snow, in which these polar people live for the greater part of the year, little is known of the manner of their construction, their internal arrangement, or of the conditions which have led to their existence.

The many inquiries I have been called upon to answer in regard to these northern cabins, and the misconceptions I have found even among the better informed of my questioners, have led me to believe that an account of the igloo as I saw it during my life with the Innuits would be of interest.

The origin of the igloo can only be guessed from the few facts we know of early man. I will not discuss the ethnological problem which would identify the Innuit of the present day with the cave-men of Europe, but, assuming that it is true, will sketch a possible history of the ice-hut.

These cave-men are known to have existed along the edges of the *mer de glace*, which, during the ice period, overspread Europe, and buried it as Greenland is probably buried at the present day. What caused this great flow of frigidity to the south, or its retrogression to the north, it is needless to consider; suffice it to suppose that our hyperboreans followed it in all its migrations. The earliest evidences of their history are those they left in the caves of middle Europe when the glacier extended nearly to the Alps and Pyrenees, beyond which, with its outlying polar fauna of cave-men, cave-bears, cave-hyenas, mammoths, and reindeer, it never extended.

These caves were the work of nature. When these people lived in their vicinity, it is probable that they knew no other habitations, winter or summer, and disputed their possession with the many animals whose bones are found beside the implements and bones of the cave-men themselves.

As the *mer de glace*, with snail-like pace, withdrew northward, it was followed by these children of the cold (the cave-men), driven, as some suppose, by the more powerful river-drift men, or following that climate which was the more congenial.

The cave-men in their retreat, tightly held by other tribes or climatic temper, when they reached the older geologic formations which no longer gave them the welcome shelter of nature's rude houses (the dreary caves), must have looked for it from other means; and these were only stones and snow-banks. The former may have been used for their more permanent homes; but the cold interiors of stone huts in such a climate must soon have driven them to the more comfortable and easily built houses that can be excavated from a snow-bank, and so greatly resemble their old cave-homes.

During the first part of their retreat, the cave-men, cave-men no longer, were in a hilly, half-mountainous country, — a character of surface favorable to the formation of snow-drifts large enough to allow of pit or excavation, in which a family could comfortably reside. Here, then, was the first igloo, rudely cut into some protecting bank of snow, its walls knowing no other construction than that of nature. Such rough types of arctic architecture are still to be found among the mountains, where wood is unknown.

As the migrating sea of ice debouched upon the shores of the Arctic Sea, and withdrew its icy blanket from these more northern regions, the ancient arctic man found himself, as he reached those limits near the White Sea and the mouth of the Petchora, in a flatter country. The snow-drifts no longer lay in such colossal depths. They were direct functions of the surface, and flattened with it. It was no longer possible to construct a deep enough house by simple excavation. The problem was probably met by digging as far as possible, and completing the structure with banks, which in time were made of blocks of snow; for the snow of the arctic winter is not of that plastic nature which will allow one to fashion it at will, as schoolboys their forts and imitation-men, but dense and compact from the extreme cold and the packing wind. Such were the first typical and perfect igloos, a direct outgrowth of the level barren lands of the arctic zone, — features which yet determine its geographical limits.

Arctic man stopped on the shores of the sea, for in the rude means at hand he could follow the ice no farther. There was another migration to the north, which was to affect the character of his dwelling: this was the migration of the forests. As soon as wood reached his door, either by direct migration of the forests or by drifting down the great northward-trending rivers, he would naturally use it in the construction of his permanent houses, as we see to-day among the natives thus situated. The igloo was probably driven from Europe, then from Asia, and is now confined to certain localities of North America.

From writing of the igloos of the Innuits, the natural inference is, that the geographical boundaries of the two would be the same. The Innuits reach from Bering Straits (and even southward along the Alaskan coast and outlying islands) nearly to those of Belle Isle, following the sinuous coast of North America at irregular intervals. They populate the western shores of Greenland, and once occupied its eastern side. Yet this vast stretch of ocean-line must be shorn of the greater portion of its length before we can narrow it down to the part occupied by the igloo-building Innuits.

The data I have already given restricting the igloo to the barren grounds devoid of even driftwood, and the fact that nearly all Esquimaux tribes are a seacoast-abiding people, will assist us in a rough but fair approximation to its limits, — limits which can be readily made clear by reference to a map of the arctic regions of North America. The mouth of Mackenzie is about the dividing-line of the timber to the west and the barren country to the east. For considerable distances on both sides of its mouth, there is a good supply of driftwood. Where this driftwood ceases on the east is the western limit of the igloo, probably fifty to one hundred miles from the river. From this point they are found all along the coast, on the portions of the Parry Islands occupied by Esquimaux, the shores of Hudson's Bay and Straits as far as Marble Island, of Cumberland Gulf, and many of the estuaries of Baffin's Bay. The limit on the south is, I believe, Hudson's Strait, and on the east Baffin's Bay.

The time during which igloos may be built depends on the length of the winter. In summer the natives use a tent of seal or walrus skin.

The pole of greatest cold is placed by Bent to the north of the Parry Islands, nearly upon the eightieth parallel, and in about 100° W. longitude. I believe the thermometric observations made in the arctic regions, straggling as they have been, go far towards showing that the magnetic and thermal poles are the same. This would bring the lowest temperatures six hundred miles to the south of the position assigned by Bent. Wherever it may be, there would the igloo have the longest existence for the year.

In the winter of 1878, being near Depot Island in North Hudson's Bay, we moved into igloos on the 1st of November. On King William's Land, next spring, we abandoned snow-houses, and took to tents on the 17th of June, having lived an igloo-life for seven months and seventeen days. That winter upon King William's Land we reared our first igloo on the 25th of September, being one month and five days earlier than at Depot Island the previous season. This would give a total of igloo-life for the southern part of King William's Land of eight months and twenty-two days, or nearly three-fourths of the year. This is the nearest to the pole of greatest cold (be it the magnetic pole or according to Bent) that any white men have lived *à la Innuit*. Assuming these two physical poles to be identical, and our position having been so near them, — being really only about a hundred miles distant, — we must have experienced about the maximum of annual igloo-life. Returning to North Hudson's Bay in the spring of 1880, we, as well as the majority of the Esquimaux living around Depot Island, moved into tents about the middle of May, giving igloo-life for North Hudson's Bay something over half the year, which is probably near the minimum.

While, of course, climatic causes principally determine the annual longevity of the snow-house, they are not the only ones. As soon as the spring thaws commence tumbling in the igloos, or making their structure insecure, the native would gladly avail himself of a tent; but this he cannot do, unless there be a clear spot somewhere near, on which it can be pitched. It may be a number of days from the time he would accept tent-life before the hilltops or ridges commence peeping through their winter covering. The inland ridges, higher and more marked, covered with black moss, which, once through the crust, makes sad havoc with the snow, appear much sooner than those facing the sea, which are flatter, enabling the inland reindeer hunters to occupy their tents earlier than the seal or walrus hunters of the coast. Some igloo-builders will wait until they can kill enough seal to make a new tent before using one. The Ooqueesik Salik Esquimaux of the Dangerous Rapids of the Great Fish River can be said to be practically without tents, securing nothing, or almost nothing, from which to make them. They hold to the shelter of an igloo late in the spring, and seek it as soon as one can be made in the early winter.

(To be continued.)

ON THE DEVELOPMENT OF THE PITUITARY BODY IN PETROMYZON, AND THE SIGNIFICANCE OF THAT ORGAN IN OTHER TYPES.

In the *Quarterly journal of microscopical science* (xxi. 750) I published a brief preliminary account of the development of the pituitary body in the lamprey, stating that it was formed from a part of the nasal sac. This account of a method of formation so entirely different from any thing that was known among the vertebrates was received with incredulity by Balfour, who says (Comp. embryology, ii. 358), "I have not myself completely followed its development in Petromyzon, but I have observed a slight diverticulum of the stomodaeum which I believe gives origin to it. Fuller details are in any case required before we can admit so great a divergence from the normal development as is indicated by Scott's statements." These fuller details have long been nearly ready for publication, but I have been prevented by circumstances from issuing them. I hope shortly to continue my series of studies on the embryology of Petromyzon, but, in the mean time, think it advisable to present this preliminary account.

My friend, Dr. Dohrn of Naples, has lately investigated this subject, and has come to the conclusion that neither Balfour nor myself can be correct, but that the pituitary body arises from an independent invagination of the epiblast between the nasal epithelium and the mouth (*Mitth. zool. stat. Neapel*, iv. 1 heft). On examining Dohrn's figures, however, I was much pleased to find that his disagreement with me is rather about terms than facts; for these drawings correspond almost exactly with those that I have already published, and many more as yet unpublished.

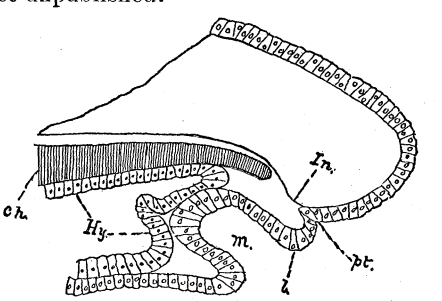

Fig. 1. — Sagittal section through head of lamprey embryo. *m*, mouth; *pt*, pituitary invagination; *In*, infundibulum; *Hy*, hypoblast of throat; *ch*, notochord; *l*, upper lip.

The development of the pituitary body, as far as I have been able to trace it, is as follows. Shortly before hatching, the mouth is formed by a deep invagination of the epiblast (see fig. 1,