Chapel Hill, and completed its first year of existence last autumn. In its first report it is stated to have seven life-members, seventy-five regular members, and seventy-four associates. Monthly meetings have been held in which the interest taken was encouraging. The papers published in the first numbers of the yearly report of the society are of good character, and receive much of their inspiration from the chemical laboratory of the University of North Carolina. A biographical sketch and portrait of Mitchell are prefixed.

LETTERS TO THE EDITOR.

Mr. Melville's plan of reaching the north pole.

IN the issue of the New-York *Evening post*, Feb. 6, I opposed Mr. Melville's plan of reaching the north pole,[1] as I could not consider the theory on which it is founded correct. In answer to my remarks, Mr. Melville in the same paper, Feb. 17, maintains his position, and denounces his critics for hindering his endeavors, instead of "sending him to prove his theories he has so much faith in, and permitting him to bring back the necessary facts that alone can carry conviction to the unbeliever without a theory." He says, "It would be more in the spirit of progress and the advancement of science, if my critics would propound new theories or other plans of progress, rather than simply find fault or say, '*I don't believe.*'" We cannot coincide with this opinion of Mr. Melville, and claim the full right to criticise a plan of exploration before it is set in motion. What is the cause of so many failures of arctic expeditions and other undertakings? Is it the careless neglect of thorough deliberation before entering into expeditions, or is it the hostility of nature? Have we nothing to learn by the Jeannette and the Proteus? If we should claim at any time the right of criticism, we do it now, when the blunders and misfortunes which effected the failures of the last expeditions are deeply impressed on public minds, and nearly extinguish the little interest which is left for scientific work in the Arctic. We consider it in the spirit of progress of science, to prove the fallacy of a plan founded on theories like those of Mr. Melville, which cannot be accepted by scientific men, and must lead to disaster, or will at least be unsuccessful.

It is somewhat difficult to understand Mr. Melville's theory; and I do not know that I am able to give an explanation of it which will satisfy the author. Mr. Melville supposes that the Arctic Ocean, north of 85° north latitude, is covered by a solid ice-cap kept in a state of equilibrium by the centrifugal force. He intends to start from the northern limit of Franz Josef Land on sledges, travelling over the smooth ice-cap towards the north pole, — a supposed distance of five degrees; i.e., three hundred miles out and three hundred miles back. In returning he intends to use the southern drift of the ice, which will carry him either back to Franz Josef Land or to Spitzbergen, where he would have depots erected for the use of the retiring party.

[1] G. W. Melville, In the Lena delta. Boston, 1885.

His view about the ice-cap will be seen from the following quotations (*l. c.*, p. 475): "After crossing the eighty-fifth degree of latitude, the traveller will come to that immovable ice-cap which will in all probability prove to be a palaeocrystic sea of ice and snow. We should have a clear, unbroken surface to travel upon, subject, of course, to fissures and shrinkage cracks." P. 476, he says, "The countless million square miles of ice annually expelled from the Arctic Ocean alone prove the fallacy of a 'palaeocrystic sea of ice;'" p. 478, "Let the state of the ice be as it may, it certainly can be no worse than the broken path over which the Jeannette's crew marched."

From these quotations, it would appear that Mr. Melville is not very certain of the existence of the ice-cap. The assertion, however (p. 479), that "the feat of marching to the pole and back will be easily practicable," and the fact that his plan is founded on this theory, prove Mr. Melville's confidence in it. If it can be proved that Mr. Melville's reasons for the existence of an ice-cap cannot be maintained, if it can be proved that an ice-cap cannot exist, his plan must needs fall to pieces. Let us enter into his proofs singly.

First: "As the centrifugal influence is acting equally in all directions, and tending to pull the ice-cap towards the equator, it can only carry away those detailed portions of ice broken near the outskirts of the ice-cap" (p. 474). No doubt, the centrifugal pull at a certain parallel will be equal on every meridian; but, supposing this continuous ice-cap to exist, an equal pull could only come to pass if it extended to the same parallel all around the pole. Every mile added to one side would increase the pull there, and disturb the equilibrium which Mr. Melville requires for his theory. Besides, we cannot imagine any kind of ice strong enough to stand the immense tension effected by the centrifugal force on a solid body of three hundred miles in radius. An approximate computation of the effects of the centrifugal force on a body of ice of three metres' thickness, extending from latitude 85° to 86°, gives a tension of nearly thirty kilograms on one square centimetre.

As soon as Mr. Melville will grant us the slightest motion of his ice-cap in any direction, he has to give up his theory, as the "nucleus of pointed island peaks, which, if nothing more, will hold the ice fast at the pole" (p. 474), will not any longer hold the cap, but break it up into an immense pack. I suppose Mr. Melville will concede that his arguments referring to an equal pull by the centrifugal force cannot be maintained.

The hydrographical and meteorological theories which he brings forth in favor of his plan cannot be supported from the present state of our knowledge in these sciences.

He supposes that there are two currents, — an equatorial, setting north; a polar, setting south, — and between both a neutral zone which he supposes at about 85° north latitude, where scarcely any current exists. Considering the observations on currents in the polar seas, we cannot understand how Mr. Melville can propound such a theory. This is not the place to treat of modern oceanography; and I can only refer to Thomson's and Carpenter's works, and to Zöppritz's mathematical theory of currents, which give a basis to this science not allowing us to form theories like Mr. Melville's. We may only be permitted to say a few words about the improbability of symmetrical currents such as Mr. Melville supposes. The Arctic Ocean forms a large Mediterranean Sea, with one wide outlet between Greenland and Norway. The exchange of water between the Arctic and the

Equatorial Ocean must be affected through this strait, as the narrow and shallow Bering Strait cannot have any influence on this system of currents. No warm current forms there a 'thermometrical gateway' to the pole. The surplus of water annually added to the arctic sea must take its way through the strait between America and Europe. In its eastern portion, between Iceland and Norway, the warm current reaches to the comparatively shallow bottom of the sea (see Mohn's researches in *Petermann's mittheilungen*). North of the submarine elevation connecting Iceland and Norway, which nowhere exceeds four hundred fathoms in depth, the cold water of the arctic sea is dammed up: so the northern current has to pass the narrow Denmark Strait between Iceland and Greenland. Here we observe the immense ice-laden current following the coast of East Greenland. Through this strait the deep-sea motion towards the equator must take its way, as not a drop of cold water passes east of Iceland. The cold water rising at the equator can pass only this way. But, from the present state of our knowledge, we do not yet know whether the greater part is carried along by the deep-sea motion, or by the superficial current. The fact is, that the polar ocean is an immense Mediterranean Sea, with one outlet, through which the surplus of water has to find its exit: therefore the whole area near the outlet must be moved by strong currents; while the remote parts, the sea between the Parry archipelago and North Siberia, will only be affected by the prevailing winds. If there were no other reason, this would be sufficient to prove the impossibility of symmetrical currents around the poles.

As for Mr. Melville's meteorology, I confess that I cannot undertake to refute his theory at this place, as I should have to fall back on the elements of this science and those of physics. "And as they [the air-currents] *do* follow the earth's surface, they take their direction toward the pole, following the spherical surface of the earth until they reach the shoulders of the ellipsoid, where the flattening of the earth commences (!); then, having received their course and direction for a distance of nearly five thousand miles, they follow their *projected direction*, and continue on above the earth's surface just as much as the flattening of the earth at the poles amounts to." (!) I should be glad to learn the place where the earth begins to flatten! Mr. Melville's assertion that a low atmospheric pressure exists in high latitudes is not correct. The centres of low pressure are the Bering Sea and the North Atlantic Ocean around Iceland. Besides, regions of a low barometer are not those of calms, but of winds.

In short, Mr. Melville's theory cannot uphold itself, and a plan founded upon it cannot prove successful. We wish Mr. Melville might confine himself to the principle that every plan of advance towards the pole should be made according to former experiences, not vague theories. We hope he will succeed in reaching Franz Josef Land, and there, no doubt, he will find most interesting results; but we oppose the hazardous undertaking of leaving the land in order to reach the pole. From the experience he will gain in the far north, he may propound a new plan founded upon his own observations there.

We think the enthusiasm of Mr. Melville for arctic researches is highly to be praised. If any thing can encourage the public, it is the struggle of the arctic heroes for their noble task, the perseverance with which they brave the dangers of climate and ice, as well as the narrow-minded opponents who scorn their ideals. We hope Mr. Melville does not class us among these. We have the most hearty interest in polar exploration, and only wish Mr. Melville might save his life and his experience for an expedition not so hazardous and not so adventurous as the proposed one.

Dr. Franz Boas.

Did Cortez visit Palenque?

This interesting question, propounded by Professor Cyrus Thomas in *Science*, v. p. 172, should attract the attention of archeologists.

As there are some inaccuracies in his statements, and as, from a study of the documents in the case, I reach different conclusions, I beg to submit them to your readers.

The locality 'Titacat' was not reached *after* the execution of Cuauhtemoctsin (as Professor Thomas says), but was the station next previous to the one at which that event occurred; to wit, at Izancanac, the capital city of the province of Acalan.

As to this name 'Izancanac,' it is evidently in the Maya language, and means 'the residence of the chief of the Itzas,' who were a well-known Maya tribe. The province of Acalan is placed, on old maps, on the southern and eastern shores of the Bahia de Terminos; and, according to Cortez, its chief city was on or near the shores of this bay.

When at Zagoatespan, between which and Izancanac the only stations were Teutiaca and Tizatepelt, Cortez sent a messenger by sea to Acalan: hence both these places were on the seacoast, or near it. At Zagoatespan he was informed that there were two roads to Acalan, — one up the country; the other, shorter, near the seashore. He followed the latter, having to pass through extensive marshes, and to cross an arm of the sea (Estero, ô Ancon) over five hundred yards wide, and from four to six fathoms in depth. A day and a half's journey from this was Tizatepelt, the first town in the province of Acalan; and five leagues from it was Teutiaca, from which Izancanac was less than a day's journey.

This plain statement shows, beyond all question, that Cortez' route lay nowhere near Palenque, and that those who place it there cannot have traced it out according to his own notes in his celebrated 'fifth letter.' It was close to the seacoast, and quite far from those celebrated ruins.

As for his description of the temples of Teutiaca, he represents Izancanac as a much larger city, with more temples, and altogether a greater place (*muy grande y de muchas mezquitus*).

D. G. Brinton, M.D.

Mammalia in interglacial deposits.

May I be permitted to ask aid from some American contributor to *Science* who follows the lore of glacial geology? I learn that some American glacialists are satisfied that there have been two periods of glaciation, and I would inquire whether the interglacial deposits contain, like those of Switzerland, remains of mammalia, and, if so, what they are. Any reference to American evidence on these points would oblige

W. S. Symonds.

The Camp, Sunningdale, Eng., Feb 27.

Colored stars.

The planet Jupiter and the star Regulus (*a* Leonis) just now are so situated as to give us a fine example of a naked-eye colored double star, and strikingly illustrate the optical effect produced by two neighboring stars of very different magnitudes. The component colors, as they appear to the writer this even-