SCIENCE:

PUBLISHED BY N. D. C. HODGES, 874 BROADWAY, NEW YORK.

SUBSCRIPTIONS.—United States and Canada.....$3.50 a year.
Great Britain and Europe..... 4.50 a year.

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ANTARCTIC EXPLORATION.

BY HUGH ROBERT MILL, LIBRARIAN, ROYAL GEOGRAPHICAL SOCIETY.

CONSIDERABLE interest has been awakened by the greater part of the Dundee whaling fleet abandoning the Davis Strait "fishing" and taking their departure for the Antarctic seas. The venture is a purely commercial one, and has been in contemplation for some time, as the northern whaling has in recent years become almost unremunerative. Shortly before the vessels sailed it became known that they might possibly afford some facilities for scientific work, and the Royal Geographical Society (London), the Meteorological Office, and other institutions took steps to obtain successful observations. Additional chronometers and standard compasses were supplied to all the vessels, together with a complete set of the best meteorological instruments. The captains undertook to lay down their track as accurately as possible, and to fix the position and report upon the appearance of any land they might sight in the far south; also to observe the variation of the magnetic needle as frequently and carefully as they could. It is not likely that startling geographical discoveries will be made, although perhaps the coast of Graham's Land may be followed farther south and more accurately mapped. Everything in this department must depend on the discretion of the captains and the caprice of the whales. The vessels will not try to make a high latitude unless it is necessary to do so in order to get a cargo, but the captains will not hesitate to force their way far into the ice if they find it to be necessary, and from their long Arctic experience in ice-navigation it is safe to say that nothing less than an impenetrable barrier will stop them.

It is unnecessary to remind the readers of *Science* that since the expeditions of Wilkes and Ross, fifty years ago, no explorations worthy the name have been made in Antarctic seas. The Challenger, probably the only steamer that has gone so far south, merely crossed the Antarctic circle, and, being unprotected against ice, had immediately to return. Recent oceanographical and meteorological researches have gradually increased the desirability of improved knowledge of high southern latitudes, and representations have been made on several occasions as to the advisability of a properly equipped scientific expedition being sent out by the British Government. While this desirable expedition is deferred, the necessarily fragmentary results of trading voyages may afford most valuable hints,

The four Dundee ships, which sailed on September 6, 7, and 8, are barque-rigged wooden vessels fully protected for ice-work and provided with auxiliary steam. Their tonnage is about 400, but on account of the enormous thickness of their timbers the size externally is nearly that of 600-ton ships. Three of the vessels, the "Balaena," Captain Fairweather; the "Active," Captain Robertson; and the "Diana," Captain Davidson, carry surgeons who were specially selected on account of their scientific tastes and their willingness to utilize all opportunities to the full. Mr. W. S. Bruce, the surgeon of the "Balaena" has a very complete equipment of apparatus for sea-temperature work and for biological collecting. He is accompanied by an Edinburgh artist, Mr. W. G. Burn Murdoch, who goes specially with the object of sketching the scenery of the southern ice. Dr. Donald on the "Active," and Mr. Campbell on the "Diana" are also equipped with appliances for collecting. Each of the ships carries a photographic apparatus.

The scientific results expected on the return of the whalers six or seven months hence are as follows: Full meteorological logs with records of surface sea temperatures and densities, and of temperatures at a few points down to the depth of 150 fathoms; deeper observations would be impracticable without hampering the real business of the cruise. A large collection of small surface organisms will be secured by tow-nets, a mode of collecting for which there will be unlimited opportunities as the vessels slowly follow their boats when engaged in whaling. No dredging can be attempted in deep water, but it is possible that there may be some shore-collecting in southern lands not previously visited. Observations on ocean-currents will be made by the captains in the ordinary course of navigation, but floats will also be launched in high southern latitudes, the recovery of which will be looked for with interest. Special attention will be directed to all phenomena connected with sea-ice, and, in case of any mud or stones being observed embedded in icebergs, an effort will be made to secure specimens in order to get some idea of the geology of the land hidden under the southern ice-cap. A large and representative selection of birds will almost certainly be secured, and some problems as to migration may be elucidated. Samples of sea-water from various depths will be brought back for careful analysis.

From a scientific point of view the expedition will be the more successful the worse it is commercially; for, if whales are not found on the margin of the ice, a very high latitude may be reached during the search for them. In any case the barometric readings are bound to be of the greatest interest, as they will throw light on the remarkable area of permanent low pressure which surrounds the South Pole. And it is impossible that the observations of so many highly trained sailors and enthusiastic naturalists can be barren of results in many departments.

THE ABORIGINAL USE OF BONE IN VERMONT.

BY G. H. PERKINS, UNIVERSITY OF VERMONT.

OBJECTS wrought from bone appear to be quite uncommon throughout the country, unless it be in the neighborhood of shell-heaps. Certainly in the Champlain Valley they are the rarest of archæological finds, and until within a few years none had been found, so far as is known to the writer. At Plattsburgh, on the New York side of the lake, a few pointed implements and barbed spear-points have been found, and are in the fine local collection made by Dr. D. S. Kellogg of that place; but until very recently none had been found on the Vermont side, and they are still exceedingly rare, although, in all, many hundreds of stone implements and ornaments, some of them of very fine workmanship, have been discovered, as well as many fragments of decorated earthenware and a few implements of copper and ornaments of shell.

For many purposes, as awls and the like, bone would seem better suited than stone and much more easily worked; and it is hardly conceivable that bone was not used more commonly than is indicated by our collections. And yet, making all possible allowance for the perishability of bone, we cannot suppose that objects made of this material were ever very abundant; for the other specimens found in some of our localities are not very ancient; and, in more than one instance, entire bones have been found in fair preservation, and there is no reason to think that if bone objects had ever been associated with those of stone they would not now be found with them.

We must then conclude that, for reasons sufficient to themselves, the former occupants of the Champlain Valley did not fashion many of their implements or ornaments from the bones of the animals which they captured, although we must admit that the few specimens found do not fairly represent the entire stock of such objects which were made and used.

After collecting in this region for more than fifteen years without seeing a single specimen of worked bone, the first one made its appearance near an old village-site, while I was digging out some bits of pottery from beneath a pine stump. It was only a tine of a deer's antler, the surface of which had been smoothed, and a rudely cut groove was about the large end, as if to enable the owner to fasten a cord for suspending the object as an

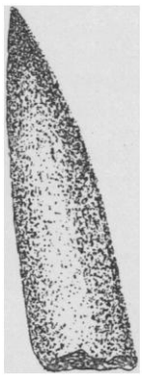

FIG. 1.

ornament. So little-wrought a specimen would attract little attention usually, but it was taken associated with stone implements, from beneath a pine stump, and was our first of its kind, and therefore possessed especial value. It is white and somewhat chalky in appearance; but I do not suppose it to be necessarily of great age, though not very recent. This specimen is about four inches long and three-fourths of an inch in diameter at the larger end. A second and shorter tine was recently found in another locality. The point of this is smoothed, and it may have been used in the decoration of the pottery which was so commonly used, and which was most frequently ornamented with lines, grooves, and the like, made by a more or less blunt point drawn across the unbaked surface of the jars. The most perfectly made and finished point found in Vermont is shown full-size in Fig. 1. It is made from a fragment of a tibia, or some other round bone, and nearly the whole surface,

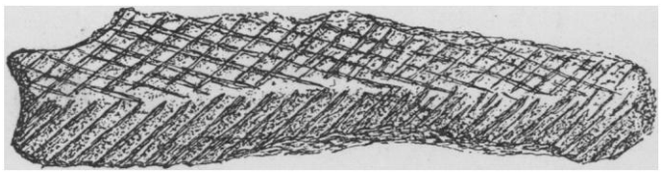

FIG. 2.

except the groove of the medullary canal, is well smoothed, and the pointed end is exceedingly well finished. This specimen was found not far from Burlington, and with it were fragments of bones, a canine of a bear, as well as stone implements. From the simple unornamented objects, such as those just mentioned, to such as that shown in Fig. 2. is a long step, but we have nothing intermediate. The specimen shown in Fig. 2 is, as the figure shows, broken along the upper and lower edge. Whether it originally was made from an entire section of a round bone, or was merely a fragment as we have it, is not readily determined. If fractured since it was ornamented, the breaking is not recent. It may have been a whistle, or tube for some other use.

As to the decoration, a glance at the figure will give a better idea of that than any description. The lines are sharply incised and quite regular, although the tool by which they were made now and then went a little astray, and the whole effect is very neat. The ends are smooth and somewhat bevelled or rounded. The length of this specimen is a little less than three and a half inches, and the greatest width three-fourths of an inch. It was found near Swanton, not far from the Canada border.

Another, and, if genuine Indian work, very interesting specimen is a mask made from a piece of a femur or some thick bone. The face is boldly and not unskilfully carved, the features all of them being strongly marked. It was found buried in the earth, not far from the specimen figured above, near Canada, and may quite possibly be the work of a passing hunter or soldier; and it is also, and perhaps equally, possible that it was carved by one of the St. Francis Indians, who formerly roamed about the region where it was found. It is apparently not very ancient. The face is oval, an inch and three-eighths long, and one and one-eighth wide, and, including the rather prominent nose, five-eighths of an inch thick.

The list here given is certainly very meagre, but it includes all kinds that have been found, and its brevity simply emphasizes the rarity of such objects in Vermont.

ON THE INTROSPECTIVE STUDY OF FEELING.

BY HIRAM M. STANLEY, LAKE FOREST UNIVERSITY, ILL.

OF all the sciences psychology is, perhaps, the most imperfect. If a science is a body of knowledge obtained by special research and accepted by the general *consensus* of specialists, then psychology is so defective as to scarcely merit the name of science. This want of *consensus* is everywhere apparent and must especially impress any one who compares the lack of harmony in manuals of psychology with the practical unanimity in manuals of botany, geology, physics, and other sciences. Even in the most fundamental points there is no agreement, as will be evident in a most summary statement.

It is now something more than a century since the general division of psychic phenomena into intellect, feeling, and will, first came into repute, but still some psychologists of note do not agree to this fundamental classification, but would unite feeling and will in a single order. As to the subdivisions of feeling and will we are confessedly wholly at sea. In intellect it is only on the lower side, sensation and perception, that anything of great scientific value has been accomplished; and even now it cannot be said that the classes of sensation have been marked off with perfect certainty. In the higher range of intellect psychology can do scarcely more than accept some ready-made divisions from common observation and logic. And if so little has been settled in the comparatively simple work of a descriptive classification of the facts of mind we may be assured that still less has been accomplished toward a scientific *consensus* for the laws of mind. Weber's law alone seems to stand on any secure basis of experiment, but its range and meaning are still far from being determined. Even the laws of the association of ideas are still the subjects of endless controversy. Also in method there is manifestly the greatest disagreement. The physiological and introspective schools each magnify their own methods sometimes so far as to discredit all others. Physiological method has won for itself a certain standing, indeed, but just what are its limitations is still far from being settled.

But the grievous lack of generally accepted results is most apparent in the domain of feeling. The discussion of feeling in most manuals is very meagre and unsatisfactory. Professor James's recent treatise, for instance, gives some 900 pages to the Intellect, and about 100 pages each to Feeling and Will. There is little thorough analysis and no perfected inductive classification. We often, indeed, find essays of literary value which appeal to the authority of literature. But to refer to Shakespeare or Goethe as psychological authorities or in illustration or proof of psychological laws is generally a doubtful procedure. The literary and artistic treatment of human nature is quite distinct from the scientific, and literature and art cannot be said to be of much more value for psychology than for physics, chemistry, or biology. To appeal to the Bible or Shakespeare in matters psychological,