this time the bird went to work promptly, "as if he knew the worms were there."

I had suggested, amongst other experiments, that he should rub a living worm over some substance that the kiwi does not usually eat, such as bread, so that it should be flavoured and scented by the earthworm juice, and then conceal it; but he has not yet, apparently, carried out the experiment.

Previously to my request Mr. Henry had experimented with a roa that he had trained to eat meat. He "planted" pieces of meat in drills three or four inches deep, and next day found them gone, "though the ground was not raked over by the bird, but probed where the meat had been hidden. This was in an enclosure whither other creatures had no access. If, when the bird was at rest, though hungry, he threw a piece of meat or an earthworm near it, it seemed at once aware of the presence of food, would wake up and reach in the right direction, touching the ground from time to time with the tip of its beak until it came in contact with the meat.

Although other and more crucial experiments are needed—and these could more readily be made in England (at Tring, for instance) under careful supervision—yet I think the above affords a certain amount of evidence for the existence in Apteryx of a keen sense of smell.

I may add that Resolution Island is quite an unget-at-able place; it is visited about three or four times a year, twice by the Government steamer on its round-trips to supply lighthouses, &c., and occasionally by other vessels at irregular times, so that four or five months may intervene before a reply is received to a letter. For instance, in reply to my letter dated April 30 I only received an answer in October. I once tried to arrange to visit the island, but the uncertainty of getting back to the mainland in any reasonable time was so great that I had to give up the idea. I hope someone in England will undertake further experiments in this direction.

W. B. BENHAM.

Otago University Museum, Dunedin, N.Z., May 6

Molecular Changes in Nickel Steel.

MR. MILNE, chronometer maker in Manchester, has kindly given me permission to send you the following interesting information. About two years ago he made a clock having a rod pendulum of Dr. Guillaume's invar steel (iron nickel alloy). It was carefully adjusted, and was recording time in a most satisfactory manner. Recently the gut of the driving weight tore, and the clock received a shock whereby the rate was altered a few seconds per day. This might be due to some mechanical movement. After re-adjustment had been effected, it was found that the pendulum was undercompensated for changes of temperature, and it appears as if the coefficient of expansion, which was said to be 0.000008 per 1° C., had increased.

The second case is a watch the balance wheel of which was made of invar steel and brass. In March, 1904, it was rated by the National Physical Laboratory, when it was found that there was no middle temperature error. Now, after two years' working, this error is ± 1.08 seconds per day, ordinary steel and brass balances having a middle temperature error of about $2\frac{1}{2}$ seconds per day. The details are as follows:—

Temperature	1904 Rate	1906 Rate
40°	+0.6	+1.08
90°	+1.6	+0.36
Mean	+1.1	+0.72
65°	+1.1	+1.80
Middle temp. error	0.0	1.08

C. E. STROMEYER.

"Lancefield," West Didsbury, June 28.

NO. 1914, VOL. 74]

MANX ARCHÆOLOGY AND NATURAL HISTORY.

IN the year 1886 the House of Keys passed an Act entitled "The Museum and Ancient Monuments Act." I well remember hearing of it, because in the course of that year I visited the Isle of Man for the first time, in order to see some newly discovered Ogam inscriptions. It proved for me the first of a series of visits to the island with the view chiefly of studying Manx Gaelic and Manx folklore. I got to know the island and its people, and noticed among other things the efforts made by two or three men with taste and zeal for archæology and history to interest the Manx people in the relics of antiquity for which the Isle of Man is famous. On one of my rambles, which led me to a public school, I remember being much struck by finding hung on the walls drawings of hatchets, hammers, and other instruments of the ages of Stone and of Bronze, accompanied with letterpress descriptions of them. They were intended to interest the more intelligent of the children in such objects, and especially to help them to recognise them when accidents exposed such treasures to view. It struck me how desirable it was that the same thing should be done in the public schools of this country, but I am not aware that it has ever been done. This example of the Isle of Man is well worth following, but I fear that the present is not a favourable moment for recommending anything so far removed from the burning question of the day. But the present war of creeds and dogmas will, it is to be hoped, be followed by a period of peace when the promoters of education may be allowed to devote more attention to some of the historical aspects of its more secular side.

The first Manx archæologists I came in contact with were Canon Savage and Mr. A. W. Moore, who has since not only become Speaker of the House of Keys, but established the right to be considered the historian of the island. I found them inspired and led by the experienced hand of Prof. Boyd Dawkins. They have been since joined by other and younger men, such as Mr. Kermodé, who has made the study of the runic crosses of the island his own. He published a valuable book on them in 1892, but he chose to call it a catalogue of them and of the inscriptions, and now a larger work of his on the same subject is passing through the press, and will contain as illustrations numerous plates and a great number of outline figures. The list of the trustees of the Manx Museum and ancient monuments includes other men of light and leading in the island, such as Mr. Ring, the Attorney-General, not to mention that they have always had the Bishop on that body, and enjoyed the support of successive Governors of the island, including among them the well-known historian, Sir Spencer Walpole. These men have always endeavoured to interest the Manx people in their ancient monuments, and they have succeeded to a great extent, but a great deal still remains to be done in the same direction. The pride of ownership is very strong in a Manxman: perhaps it is in all small nationalities—at any rate, I have noticed it not only in Man, but also in my own country, the Principality of Wales. What may be the explanation I do not know, but a member of a small nationality is a more considerable portion of that nationality than if he belonged to a larger nationality, and perhaps that has something to do with the greater difficulty which he finds in rising to the idea of giving up to the nation anything of which he is the exclusive owner. That is, however, not what I was coming to, but to the fact that, in

spite of the pride of ownership, the safe keeping of the object owned is by no means guaranteed either in Man or Wales. But to confine my remarks for the present to Man, I may say that I have known a sad case of perversity of this kind in the matter of a piece of most valuable antiquity, which I abstain from describing more minutely. This is within my own knowledge, and I think no superstitious feeling entered into the matter; but in a case I have heard of it is possible that an element of superstition mixed itself with the mere sense of ownership. I was told years ago that an ancient burial urn had accidentally been exposed partially to sight, but that the owner could not be persuaded to allow it to be carried away to a museum. At the same time he would do nothing to protect it from being damaged by boys shying stones at it or from other dangers. Here there may have been a superstitious fear of removing anything supposed to be connected with the dead. At all events, it will serve to illustrate one of the grave difficulties which those have to face who want to see the relics of antiquity brought to places of safety.

This leads me to mention the last "Report of the Manx Museum and Ancient Monuments," which lies before me, dated March 6, 1906, signed by the chairman, Mr. Moore, and the hon. secretary, Mr. Kermode. It shows very clearly how far the trustees have got with their scheme, and what its objects are. These, as the title suggests, are two—the safe keeping of the ancient monuments, and the exhibition of them for the education of the Manx people, or rather of a wider public still; for nobody can, for instance, be said to have completed his study of runic crosses and Scandinavian epigraphy without visiting the series in the Isle of Man, the most central spot in the British Isles, and one most easily accessible from Liverpool and the north of England. Under the first heading a "Scheme for the Better Preservation of the Manx Sculptured and Inscribed Stones" has been adopted by the trustees, subject, of course, to alteration in detail where found necessary, and to the consent of the rectors and vicars of the parishes concerned. This scheme seems really to consist of so many separate schemes as there are parish churches with important monuments of antiquity near them. Even had there been a spacious museum ready to receive all the stone monuments of the island, no Manxman would probably entertain the notion of removing thither the more important runic crosses such as the group at Kirkmichael. So the arrangement which finds favour is that of constructing sheltered places for them near or within the churchyards where they stand. The work has been done already in some instances, and it may all be expected to be completed in the course of the summer. The Tynwald Court has unanimously voted, for the carrying of it out, 250*l.*, and 150*l.* more are expected from voluntary contributions.

Thus far of the protection of the larger of the ancient monuments in their respective localities. The smaller objects of antiquarian interest ought to find their safe keeping in a museum, but to meet this want less progress has been made. It is now some ten years since the trustees adopted a memorandum to the effect that the Manx Museum should consist of local objects to illustrate fully the archaeology and natural history of the island, and the buildings requisite for the purpose should have a minimum area (including galleries) of 5000 square feet, and cost no less than 5000*l.* They also agreed that such an institution, being purely national, not municipal, should be provided partly by public subscription, partly by a grant from the revenue, and partly by the rates of the town in which the museum was to be estab-

lished. The town, they thought, should be Douglas, and the cost of maintenance, estimated at 250*l.* per annum, should come out of the revenue, not out of the rates. The question of ways and means was in due time discussed, but nothing seems to have been done even by the town of Douglas, which was at one time eager to have the museum. In the meantime Governor Henniker placed a portion of Castle Rushen, at Castletown, at the disposal of the trustees for the purpose of a temporary museum. In fact, the nucleus of a collection had been stored there since the time of Governor Loch. Other articles, however, had been stored at the Government Office in Douglas and in Peel Castle; but the former have been added since to the Castle Rushen collection, which has been still further increased by the generosity of benefactors, especially Canon Savage.

So for the present Castle Rushen, a famous mediæval fortress, is the insular museum, and it is curious to read that the banqueting hall, that had witnessed scenes "of revelry by night," has the fine and very perfect example of the "Irish elk" from Poortown standing in the middle of the floor—it is, if I am not mistaken, not the only "Irish elk" found in the island; I have heard it said that one was presented by one of the Scottish kings of Man to Edinburgh. Among contents on a less colossal stage are the valuable casts of the early sculptured stones and inscribed monuments found in the island, a hundred and twelve in all—and the casts are already too few, for at least two more cross slabs have been discovered since the drafting of the report. In fact, this is one of the most encouraging aspects of the whole business. The collection is steadily increasing as the result of gifts, purchases, or loans, as the catalogue testifies. But here comes the difficulty, for, as the trustees point out, even for the purposes of a local archæological collection making any approach to completeness the space is insufficient for the methodical exhibition of it to the best advantage. This leaves out of consideration other aspects of the museum question, for the trustees are forced to add that though they are very willing to receive and store geological and local natural history objects, they are at present unable to exhibit them. Manx archæologists are only just in time to save the crosses of the island, but every year much is being lost for ever for the want of a museum, and the loss is not only that of Man, but of the archæology of the British archipelago as a whole.

But how is the museum to be provided? There seems to be no prospect of the island setting one up, even at the modest expense of 5000*l.*, and as to that figure I should guess that the bare building required would cost that sum, not to mention the furnishing, which would probably cost another 5000*l.* Before all I ought to have mentioned the site, for which, if it is to be at Douglas, I would rather not indicate any sum. Suffice it to say that the money difficulties are such that I can only make one suggestion, and that is, that the Imperial Government should take the matter in hand. What it has done for the island of late besides affording it and its herring fleet general protection I know not; but it is understood that the island, besides paying the expenses of its own Government, pays direct to the imperial exchequer 10,000*l.* annually, besides a very large income from royalties and other sources of revenue which discharge perennially into the coffers of the Crown. Having alluded to these disbursements, it is needless to point the moral. All lovers of fair play will agree with me that it would be but reasonable for the central Government to come to the help of the Manx people in the matter of its antiquities and natural history, and the sooner the better.

JOHN RHYS.