Intellect in Brutes

IN answer to the objections raised by W. P. Buchan and Henry Muirhead to the case of rats gnawing water-pipes for the express purpose of obtaining water, as described in my letter to NATURE, vol. xix. p. 365, I propose to give particulars of the situation of the pipes so gnawed in two instances. No. I. At Poplar. Pipe laid on second floor, between flooring-boards above and ceiling below, between joists the usual distance apart; plenty of room all round pipes to obtain access to any part of the floor, also rat-holes in woodwork to facilitate communication. As the pipe lay above the ceiling of the floor below, there was no necessity to attack the pipe in order to get through that ceiling—if that were desired. A hole could easily have been made at any point on either side of the pipe. The upper floor was a corn loft, and it is inferred from the circumstances, that the rats, feeding upon this very dry food, had tapped the water-pipe to obtain a supply of water close at hand. No. II. On Haverstock Hill. Cistern in scullery about six feet from the floor, pipe (lead), comes thence down wall, passes under floor of scullery to kitchen to supply kitchen boiler. Pipe laid on the *earth*, between joists, raised, of course, on bricks. Pipe gnawed on upper side. Plenty of room all round for rats to pass freely under all parts of the floor, as any practical builder will readily understand. They could have tunnelled *under* this $\frac{3}{4}$ -inch pipe from either side through the soft earth. Of the two holes in the pipe one will admit a small pin, the other is about $\frac{1}{8}$ th of an inch in greatest diameter, and about an inch from the first. These are transverse perforations, the ineffectual attempts are in a longitudinal direction. It is of course quite possible, as in Mr. Buchan's cases, that rats occasionally find gas-pipes in their way and are *compelled* to attack them, but I do not think any of your readers will imagine that his question, "Now, are they cut to get at the gas?" needs a moment's consideration. Possibly some of your correspondents may be able to corroborate the following—A ship's carpenter told me that, in the old days before the use of iron tanks on board ship became general, the rats used to attack the water casks, cutting the stave so thin that they could suck the water through the wood, without actually making a hole in it. If any one could substantiate this it would have an important bearing on the question under consideration.

ARTHUR NICOLS

I AM glad my remarks have elicited others, for I want to have my difficulty solved, which I will put thus:—Why is it that no dog ever (to my knowledge, of course) observed a person ring a bell, noticed that the bell brought the servant, and then went through the process of reasoning—"Because such was the result I will ring the bell too"? This I call abstract reasoning. On the other hand, why is it at all necessary to teach the dog to ring the bell? for it is not necessary to teach a boy. Boys do acquire sooner or later abstract reasoning, but it is with them practically a feeble power, as I have shown, and with rustics it seems, sometimes, to be totally in abeyance, as the following illustration will show. An entertainment was given to some hundred labourers and their wives, and a Mr. Cross told them to spend the afternoon in a field, but hoped none of them would be *his name*. Not one understood him, or could go through the simple process of reasoning—"We are not to be his name, his name is Cross, therefore we are not to be cross." It is this *mental reflection* which seems to me to be wanting in animals; thus, monkeys will warm themselves by a fire of burning sticks, but do not seem capable of thinking—"Because sticks burn, therefore, if I put more sticks on the fire I shall get more warmth." I should be extremely glad to hear of any cases of such purely *abstract mental reflection* in animals, for at present, there seems to me to be a hiatus here.

GEORGE HENSLOW

On the Freezing of Lakes

WE wish to draw your attention to a statement contained in an article under the above heading which appeared in NATURE last week, p. 412.

The author, Mr. J. Y. Buchanan, says:—

"Most of the observations were made with one of Negretti and Zambra's 'half turn' deep-sea thermometers, which proved a useful instrument for this species of inquiry. It was necessary, however, to fit it with a suitable inverting contrivance, as the apparatus supplied for this purpose by the makers is quite useless."

Fortunately this thermometer and apparatus has now been in use for some time, and its performance fully tested by persons whose opinion is of the highest value. We can only say that had Mr. Buchanan used the apparatus according to our printed direction, viz., lowered the instrument to the required depth, let it remain a few seconds, and then pulled it up as fast as practicable and without stopping, he would not have failed to have obtained correct results. We cannot possibly imagine how he could have failed; had we not ourselves tried the inverting apparatus in every possible way, and had we not received the highest testimony as to its efficiency, we would have remained silent, but as it is, and knowing we have invented as good an instrument as has ever been contrived for the purpose, we cannot allow the statement to pass unchallenged that we have supplied a useless apparatus. If Mr. Buchanan could not obtain satisfactory results with our apparatus it must only have been because he did not use it as we directed.

HY. NEGRETTI AND ZAMBRA

THE MIGRATION OF BIRDS

MORE than four years ago an article, headed as above, appeared in this journal (vol. x. p. 415) giving rise to some comments of more or less importance (*tom. cit.*, pp. 459, 520, and xi. p. 5). Since that time two very remarkable treatises on the subject have come forth, the one by Dr. Palmén, on the routes taken by birds in their migrations, and the other by Dr. August Weissmann, dealing generally with the whole question.¹ The first, originally published in Swedish,² was translated into German soon after, and in due time was reviewed in these columns (vol. xv. p. 465). An excellent English version of the second has recently appeared in the "Contemporary Review" (February, 1879, p. 531), and therefore my readers may be presumed to be acquainted with the views of both authors. It cannot be denied that each of them has to some extent enlarged the boundaries of our knowledge of the subject, and still more widely those of our speculations upon it.

As regards Dr. Palmén's work, the opinion held by his reviewer in these columns as to the assignment of routes to the migratory birds of North-Western Europe being "purely conjectural" is one that I wholly accept. I should even be inclined to go further, and say that it might be called rash, as it is evident that no such observations as would justify its adoption exist. Still I concur with the reviewer in that I would not at present term it entirely erroneous, though I venture to express my entire disbelief in the route "X." This is supposed by Dr. Palmén to start from Greenland and Iceland, and to pass by the Færoes to the Hebrides, when, after coalescing for a short distance with one or more lines from the north-east, it either loses itself on the West Coast of Ireland, or, running down St. George's Channel, skirts Scilly and crosses to the shores of the Bay of Biscay. Space forbids my entering into details which would show, I think, that this route is altogether imaginary. I will only say that what we know of the movements of two very characteristic summer visitants to Iceland, *Motacilla alba* and *Limosa algocephala*, points to that conclusion, and I would leave it for Irish ornithological observers to prove whether Dr. Palmén is right or not.

Dr. Weissmann, happily for him, has no such compunction. He fully accepts Dr. Palmén's conjectures as absolute truths. Suppose, however, we assume them to be established—and there seems no reason why further observation should not establish most of them—they would show in Dr. Weissmann's opinion that the migrating birds of to-day in crossing the sea follow what once were "land-bridges" (*Landbrücken*), that is, isthmuses of dry land separating seas or oceans under which they are now submerged. The existence of such former terrestrial communications between continent and con-

¹ Sammlung gemeinständlicher wissenschaftlicher Vorträge. XIII. Serie Heft 291. "Ueber das Wandern der Vögel." Berlin, 1876.

² Om Foglarnes flyttningssvägar. Helsingfors, 1874.