long exclusively to the tertiary formation and hitherto considered extinct. Such are *Leda excisa* of Philippi, and an undescribed species of the same genus (Calabrian and Sicilian fossils), *Scalaria corrugata* of Brocchi (Subapennine), *Kellia pumila*, *Neæra jugosa*, and *Cerithium granosum*, all of S. Wood (Coralline Crag), and an undescribed species of *Fusus*, which I propose to name *Sarsi*, lately found in the Red Crag. Mr. Wood is inclined to refer this last species to *F. Spitzbergensis* of Reeve; I regret that I cannot agree with him in such determination. Our Coralline and Red Crag beds notoriously contain a large proportion of northern species; and I was not far wrong in regarding the former as the "cradle" of the British Mollusca. I may here remark that, as in Shetland, valves and fragments of *Pecten Islandicus*, *Tellina calcaria*, and *Mya truncata* var. *Uddevallensis* (all Arctic species) were dredged in rather deep water, on the western coasts of Ireland; and a perfect specimen of *Leda arctica* was found in Loch Torridon. These shells are apparently in a semi-fossil condition; but it is impossible to say whether they are quaternary or recent.

As regards marine zoology, this expedition has produced results more important than those which have ever been obtained in any previous expedition of the kind by the enterprise of our own or any other nation; and I cannot help expressing a fervent wish that it may be renewed next year. The United States, France, Sweden, and Norway are prosecuting with great success this line of scientific research; and I feel confident that Great Britain, with her vast wealth, naval resources, intelligence, energy, and perseverance, will keep the lead which she has now taken.

As one of the naturalists who were privileged to assist in the late expedition I shall be happy again to place my humble services at the disposal of the Royal Society in continuation of the work, especially in conjunction with Dr. Carpenter and Prof. Wyville Thomson.

J. Gwyn Jeffreys

*** At the Meeting of the Royal Society at which the observations described in the above paper were communicated, Professor Alexander Agassiz gave an account of the principal results arrived at by the American Dredging Expedition. The ground explored was limited to a length of about 120 miles by 60 to 90 miles in width between the Florida Keys and the Northern Coast of Cuba, and although the depth reached was by no means as great as that attained by the last British expedition, not being much more than one-third of it, about 820 fathoms, yet the results were fully as striking, and agree in the main points with the conclusions arrived at by the English explorers. Commencing with the sponges, which contained a great number of siliceous forms, he gave as the results of the examination of Dr. Oscar Schmidt, of Graatz, the specific identity of the majority of the species with Mediterranean, Azoric, and Atlantic species, showing a geographical range quite unprecedented, and extending the Atlantic fauna from the Gulf of Mexico to the Bermudas, the Azores, the Mediterranean, the Western Coasts of Europe, and extending far north to the boreal regions of Norway, Iceland, and Greenland. These same results would apply, as far as the collections have been examined, to the Echinoderms, Mollusca, and Crustacea, though the number of identical species in these branches over this extensive Atlantic area is much smaller. Among the Echinoderms, the *Echini* specially showed several new and interesting forms, recalling types characteristic of the cretaceous period; one genus especially, the genus *Salenia*, is represented in our seas by a most interesting species. Another cretaceous type, a new genus of *Spatangida* (Pourtalesia) was found in deep water in Florida, and like the Crinoid genus *Rhizocrinus*, was also dredged by the Porcupine expedition. Several other species of Echinoderms were also shown to be identical on both sides of the Atlantic.

Prof. A. Agassiz gave besides an instance of one of these so-called cretaceous generic types, which was only the young stage of a well-known genus represented from the time of the chalk through the tertiaries, and which is now found living in the tropical seas, showing how careful we ought to be in our generalisations when drawn from a class where the transformations from the young stages to the adult are as great as they are in Echinoderms. He gave as an example of this the case of two species of Echini, one of which is known under one generic name (*Stolonoclypeus*), as the adult, in Florida, while the young is known under a different generic name (*Echinocyamus*) in Europe, and endeavoured to explain by the action of the currents the migration of the pelagic embryos, many of which remain in a helpless condition for several months, and thus to show how changes of currents, brought about by the elevation or subsidence of portions of continents, would fully account for the present limitation of marine faunæ. The presence of corals at great depths will also materially alter the views generally received of the depth at which reef-builders may work, and modify to a certain extent Darwin's theory of the reefs, and their mode of growth. Prof. A. Agassiz alluded to the probable continuation of the exploration of the Gulf Stream by Prof. Pierce, the superintendent of the W. S. Coast Survey, who was carrying out the plans laid out by his predecessor, Professor Bache; and trusted that the Coast Survey would carry on the investigations so successfully inaugurated, thanks to the enlightened views of Professor Pierce, and the executive ability of the assistant in charge, Count Pourtales. This exploration would consist of a series of normals to the coast of the United States, extending from Georgia to New York, completely across the Gulf Stream, thus extending sufficiently far north to meet upon a common ground the English expedition, which the British Government could not fail to send in consequence of the brilliant results of the two previous years.

SCHOLARSHIPS AND EXHIBITIONS FOR NATURAL SCIENCE IN CAMBRIDGE

THE following is a list of the scholarships and exhibitions for proficiency in natural science, which are likely to be offered in Cambridge during the ensuing year.

Trinity College.—One of the value of about £80 per annum. The examination (in chemistry, physics, physical geology, including meteorology and the elements of mineralogy) will be in Easter week, and will be open to all undergraduates of Cambridge and Oxford. Further information may be obtained from the Rev. E. Blore, tutor of Trinity College.

St. John's College.—One of the value of £50 per annum. The examination (in chemistry, physics and physiology, with geology, anatomy, and botany) will be on 29th and 30th of April, and will be open to all persons who are not entered at the University, as well as to all who have entered and have not completed one term of residence. In this College, moreover, natural science now is made one of the subjects of the regular college examination of its students at the end of the academical year (in May); and exhibitions and foundation scholarships will in consequence be awarded to students who show an amount of knowledge equivalent to that which in classics or mathematics usually gains an exhibition scholarship in the College. In short, natural science is on the same footing as classics and mathematics, both as regards teaching and rewards.

Christ's College.—One to four, and in value from 30*l.* to 70*l.*, according to the number and merits of the candidates, tenable for three and a half years, and three years longer by those who reside during that period at the College. The examination will be in April, 1870, and will be open to the undergraduates of Christ's College; to non-

collegiate undergraduates of Oxford; to all undergraduates of Oxford; and any students who are not members of either University. The candidates may select their own subjects for examination. Besides these there are three other exhibitions perfectly open, which are distributed annually among the most deserving students of the College.

Clare College.—One of the value of 50*l.* per annum. The examination (in chemistry, chemical physics, comparative anatomy, physiology, and geology) will be on March 30th, and will be open to students intending to begin residence in October. The candidates must show such acquaintance with classics and mathematics as will qualify them to pass the previous examination.

St. Peter's College.—One of the value of 60*l.* per annum. The examination (in chemistry, botany, comparative anatomy and physiology) will be in June, and will be open to all students who are not members of the University, or who have not commenced residence in the University.

Downing College.—One or more, according to the merits of the candidates, of the value of 40*l.* per annum. The examination (in chemistry, comparative anatomy, and physiology) will be in March, and will be open to all students not members of the University, as well as to all undergraduates in their first term.

Sidney College.—Two of the value of 40*l.* per annum. The examination (in heat, electricity, chemistry, geology, physiology, botany) will be in October, and will be open to all students who may enter on the college boards before October 1st.

Although several subjects for examination are in each instance given, this is rather to afford the option of one or more to the candidates than to induce them to present a superficial knowledge of several. Indeed, it is expressly stated by some of the colleges that good clear knowledge of one or two subjects will be more esteemed than a general knowledge of several.

Candidates, especially those who are not members of the University, will in most instances be required to show a fair knowledge of classics and mathematics; such, for example, as would enable them to pass their previous examination.

There is no restriction on the ground of religious denomination in the case of these or any of the scholarships or exhibitions in the university or the college.

Further necessary information may be obtained from the tutors of the respective colleges.

It may be added that Trinity College will give a fellowship for natural science once, at least, in three years, and that most of the colleges are understood to be willing to award fellowships for merit in natural science equivalent to that for which they are in the habit of giving them for classics and mathematics.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his Correspondents.*]

Mental Progress of Animals

I HAVE failed to meet with a satisfactory treatment of this subject either in works of mental philosophy or natural history. Sir John Lubbock, in "Prehistoric Times," refers to the likelihood of the sagacity of man and the wariness of animals proceeding *pari passu;* but he does not develop the idea or aid it by illustration, and I find that the tradition still widely prevails that the instinct and intelligence of animals is a thing fixed and unchangeable; and that the mammals which roamed over the world during the earlier and middle tertiary epoch must be credited with the same amount of sagacity as their representatives of the present day. Such statements are assumptions opposed to the current of any facts we possess on the subject. Much of what has been termed *cunning* in animals will be found to have been very much sharpened and made evident in quadrupeds and birds, owing to the new necessities imposed upon them by man the tamer or man the destroyer.

For it is under one of these two characters that man approaches animals, affecting them in the most complex and vivid manner. No bird or quadruped so high in the mental scale as the dog, horse, rat, rook, or sparrow, has been found in the lonely oceanic isles or in any region free, or all but free, from human influence; not because in these quarters such animals could not exist, but rather it would seem because the aboriginal fauna had no opportunity for the improvement of its wits by coming in contact with an enemy or friend so complex, dreadful, and ingenious as a human being.

One of the first impulses communicated to the wits of the wild animals is that derived from the sense of new wants. Now, this is what man supplies by his cultivated fruits and cereals. A feast is spread before quadrupeds and birds more generous than that of nature. But this banquet is guarded, and often becomes a baited trap in which the simple thief is caught; but a very slight increment of sagacity is sometimes enough to turn the scale, and this quickness of wit, especially in the first ages of society, as among existing savages, would be slowly met by improvement of trap. Necessity—on either side the mother of invention—would at last permit only wary vigilant enemies, since these alone could succeed, to hang round the skirts of kraals and wigwams, approach in twilight the crops near stockaded villages, prowl about places of interment, lodge in sewers, enter cellars; and, keenly alive to every sign of danger, multiply in spite of poison, trap, and gun, and in defiance of trained animals of their own and allied species, and that division of labour which gives us special hunters.

The fear of man is a slowly acquired instinct. Mr. Darwin, in his account of his travels, gives some interesting instances of the fearlessness of birds little exposed to man in South America. The crew of Byron's vessel were astonished at the manner in which the wolf-like dog of the Falkland Islands approached them merely out of curiosity. Compare these traits with the admirably organised expeditions for plunder of baboons, elephants, &c., and the rude customs acted upon for self-preservation of the half-wild dogs of the Peninsula and the East, wherein the care of the weak and young, the usefulness of sentries, the value of signals, the difference between sham and real danger, and the advantage of confusing traces of retreat, seem all to be known, and it will be pretty evident that man the thinker has to a considerable extent reacted on animals wild and domestic. Even in my own quarter it is the steady belief of the shepherds that the common sheep-dog has progressed in intelligence and docility within the last fifty years by careful selection. "Where the dog is not valued for intelligence, as in some Eastern countries, it is a much more stupid animal than with us."

Now were we in vision to behold that wonderful Miocene age, when the great mammals roamed over Europe unpeopled as yet by man, I am convinced that both they and the birds of the period would be less interesting and more monotonous in their habits than those which people Europe at the present day, and have for ages been engaged in a struggle for existence with a being so much superior to themselves; and that in prehuman times the horn, hoof, tooth, and coat of mail, to a far greater extent than now, ensured victories which other and more subtle agencies are now necessary to secure on the part of those animals nearest to man in organisation and habits.

Nov. 21 J. S.

The Suez Canal

I NOTICE in your number of 4th inst. an article relating to the Suez Canal (by Mr. Login, C.E., late of the Ganges Canal), and shall be glad if you will allow me to make a few observations with reference to it.

In making his suggestions, Mr. Login appears to have overlooked the fact that there is already a sweet-water canal connecting the Nile with the centre of the isthmus, and passing through the Wadi Toumilat, which it has watered and fertilised; and, further, that it is proposed, when the actual work of excavation in the maritime canal is completed, to commence irrigating operations on a large scale by means of this canal.

As to diverting the Nile, or one of its mouths, and thereby forming the great maritime canal, that is quite another affair. In the first place, if I remember rightly, the water in the present sweet-water canal, where it meets the great canal, is some twelve feet above the level of the latter—in other words, above the level of the sea. Does Mr. Login think, then, that to carry the water at this level for 50 or 60 miles across and above the shallow lakes of Menzaleh and Ballah and the plain of Suez