cluded another new species of Ceratoisis and five other forms previously described. Prof. Hickson and Mr. F. H. Graveley deal with the hydroid zoophytes, which include some interesting forms, especially *Hydractinia dendritica*, n.sp. Though there is no definitely new generic type, there are ten certainly new species and five more probably new—a very large proportion out of a total of twenty-five. It may be noted that only two of the twenty-five were got outside the limits of McMurdo Bay and the edge of the great ice-barrier, so that we have here a fine representation of the hydroid fauna from the most southerly limit of our knowledge of marine zoology. It is also interesting to find that three of the species are common on British coasts. Dr. John Rennie makes a note on the extraordinarily long tentacles of some unknown siphonophore. They were about as stout as an ordinary bootlace and nearly twenty feet in length. Mr. Hodgson gives a graphic account of the difficulties attending their capture.

Among the sponges, Mr. R. Kirkpatrick found four species of Tetractinellids, forty-three Monaxonellids, twenty-four Calcarea, no Keratosa, and ten species of Hexactinellids. He describes the Hexactinellids, of which three were new genera and eight new species.

The third volume ends with a report on the marine algæ (Pheophyceæ and Florideæ) by Mr. Gepp and Mrs. Gepp, a description of a new coralline by Dr. M. Foslie, and an account of the mosses by M. Jules Cardot. It need hardly be said that with such bulky volumes before us it has not been possible to give more than a hint of the amount of sound and interesting work which they contain.

THE CURE AND PREVENTION OF SLEEPING SICKNESS.

THE sleeping sickness is, and unfortunately continues to be, the most burning problem of European colonisation in equatorial Africa. Like any other medical problem, that of sleeping sickness has two sides, which may be distinguished broadly as prevention and cure. Investigators in all parts of the world have been experimenting actively with the object of finding a drug, or method of treatment, which shall act in sleeping sickness as quinine does in malaria; that is to say, which shall destroy the parasites in the blood, without seriously affecting the health of the patient. Up to the present, the atoxyl treatment has given the best results, but it has often failed to produce more than temporary amelioration, and it is open to doubt if it has produced a complete cure in any case, while, like other arsenical compounds, it may have serious toxic effects. On Thursday last, however, a communication was made to the Royal Society by Drs. H. G. Plimmer and J. D. Thomson, of the Lister Institute, on the effect of certain antimony salts; and, to judge from the preliminary experiments on rats, these compounds appear to be far more efficient in their curative action, and at the same time less toxic in their effects, than atoxyl. The experiments will be extended at once to larger animals and to man, and though it would be premature to say that the long-sought-for cure has been found, the outlook is certainly more full of hope than it has ever been before.

The question of the prevention of sleeping sickness is of course, bound up with the etiology of the disease. It is known that the disease is caused by the presence of a minute flagellate parasite or "trypanosome," first in the blood, later in the cerebro-spinal fluid of the patients; and it is known that the trypanosomes are conveyed from diseased to healthy subjects by the bite of one, possibly more than one, of the species of blood-sucking tsetse-flies. It cannot be too emphatically stated, however, that the tsetse-fly is not, as so often stated, the "cause" of the disease; if the fly be not infected, its bite is harmless, and Koch and others have reported the existence of large areas in which the fly swarms, but in which sleeping sickness does not as yet exist, although the necessary condition for its diffusion is found.

It follows that the problem of prevention may be attacked in two ways; extirpation of the fly, or control of the infection. Considering the vast extent of the range of the species of tsetse-flies in Africa, considering, further, that these flies, being viviparous, have no free larval stages in which they can be destroyed, like mosquitoes, any notion of extirpating tsetse-flies must be considered as frankly utopian. The measures adopted by our Government are wisely directed towards controlling the spread of the infection. Since the fly haunts thick bush on the lake-shore exclusively, the jungle is to be destroyed at all ports, ferries, and landing-places on the lake, where it is unavoidable that human beings should visit the lake-shore; at other points the natives are to be removed from the shore, and persuaded or coerced to live out of the effective range of the fly. Natives known to be diseased are to be segregated, prevented from wandering into the "fly-belts," and placed under treatment. By this means it may be reasonably expected that the spread of the infection may be checked.

There remains, however, the possibility that some wild animal may play a part in spreading the infection, since other animals besides man are known to be susceptible to the trypanosome when inoculated with it in the laboratory. As yet, however, no vertebrate, other than the human species, has been proved to harbour the trypanosome of sleeping sickness in a state of nature. It is well known, however, that other species of trypanosomes, in no way connected with sleeping sickness, are found commonly in wild animals of all classes; and it may be added that the tsetse-flies are quite as willing to suck the blood of a reptile or bird as that of a mammal. Hence there is always the possibility that some species of wild animal may act as a "reservoir" from which the supply of the trypanosome of sleeping sickness may be kept up indefinitely through the agency of tsetse-flies. It is, therefore, of the utmost importance that further researches on the etiology of sleeping sickness should be carried on, with the special object, among others, of discovering any such indigenous source of the disease, for it need hardly be pointed out that it would be of little use to prevent tsetse-flies becoming infected from human beings if they could also obtain the infection from natural sources.

THE POLLUTION OF RIVERS.

ON Thursday, October 31, an influential deputation from the British Science Guild interviewed Mr. Burns, M.P., at the Local Government Board, upon the subject of legislation with respect to the prevention of the pollution of rivers, and the protection of the public against the contamination of shell-fish.

In most directions the tendency to the pollution of our water supplies increases with the demand for pure water, and the area from which such water can be obtained in the neighbourhood of our towns is diminishing. The existing local authorities have conflicting interests when dealing with river pollution, and considerations of guarding the purity of streams are often subordinated to those of refuse disposal and manufacturing requirements. What too often happens is that a sanitary authority, situated toward the head of the stream or upon one of its tributaries,

collects its own drinking water from a comparatively pure source, and then adopts the selfish policy of permitting its refuse matter to enter the stream below its own intake, with too little regard for the needs of its neighbour lower down the course of the same river. Perhaps it is hardly to be expected that, of its own initiative, a sanitary authority will face a great deal of extra trouble and expense (beyond what is necessary for its own purposes) in conserving the quality and quantity of water when the entire benefit is to be reaped by other authorities; and this is one of the reasons why a general policy should be adopted and enforced by a central authority.

Although certain river conservancy boards exist and have done good work, and several county councils have done much to reduce the contamination of streams, these bodies are unable to do all that is necessary. The Rivers Pollution Prevention Act of 1876 was not framed so as to render the assistance which such an Act could be made capable of, and most of our larger rivers course through more than one county or between the existing purely arbitrary boundary of counties. The rivers and watersheds of the country are, moreover, generally too extensive to be embraced by any existing sanitary authority.

The case in favour of putting the whole of the watershed areas under one controlling authority is therefore a very strong one. The matter, both in its magnitude and importance, is clearly a national one, and a central authority for the whole country is what is needed. The duty of such an authority would be to maintain a sufficient sanitary supervision and control over authorities whose districts form important catchment areas for our water supplies, with the view of maintaining the purity and volume of the waters at standards sufficient to meet the domestic and trade demands of the country as a whole. Such an authority would also arbitrate and advise upon points in dispute between sanitary authorities, or between sanitary authorities and local industries—in so far as these matters relate to the contamination of water; and the heavy expenditure now entailed by costly and often ill-advised litigation, frequently leading to unsatisfactory results, would more than pay for the expert handling of matters in dispute by the central authority.

There can be no difference of opinion upon the fact that the central authority in this matter should be the Local Government Board; and in the legislation which it is sought to promote certain powers in the above-mentioned direction would be given to that Board, and, in addition, measures are introduced to protect the public health against the pollution of shell-fish.

Mr. Burns received the deputation in a most sympathetic spirit, and expressed the hope of being able to introduce a Bill, dealing with matters referred to by the deputation, in the spring of next year.

SIR JAMES HECTOR, F.R.S.

DEATH has removed the last of the four distinguished geologists, F. von Hochstetter, Sir Julius von Haast, F. W. Hutton and Sir James Hector, who together laid the main foundations of the geology of the Dominion of New Zealand.

Sir James Hector was born in Edinburgh on March 16, 1834, and was the son of Alexander Hector, a Writer to the Signet. He was educated at the Edinburgh Academy and University, where he matriculated in 1852, took his degree of M.D. in 1856, and served as assistant to Edward Forbes and to Sir James Simpson. His knowledge of natural history and medicine, and the influence of Murchison, gained him the post of surgeon and naturalist to Captain Palisser's expedition to the Rocky Mountains of British North America. The expedition was in the field from 1857 to 1860, and its best known result was the discovery of the pass by which the Canadian Pacific Railway now crosses from the Great Plains of Canada to the Pacific coast. At the close of the expedition Hector visited the gold-fields of California and northern Mexico, and he reported upon the coal mines of Vancouver Island. On his return to Scotland he wrote a series of papers on the botany, ethnography and physical geography of the Canadian Rocky Mountains, and a paper, of modest length, "On the Geology of the Country between Lake Superior and the Pacific Ocean (between 48° and 56° N. lat.). . . ."

In the year of his return from America he was appointed geologist to the Government of Otago, and there began the main work of his life. He made extensive and arduous journeys through the province of Otago, which still contains the least known and most difficult country in New Zealand. Some of his results were given in 1863 in a New Zealand Parliamentary Paper on "An Expedition to the North-west Coast of Otago," in which he described the discovery of the pass from Martin's Bay to Lake Wakatipu. His success in Otago soon gained Hector promotion from a provincial to a federal appointment. He was made one of the Commissioners for the New Zealand exhibition at Dunedin in 1865, in preparation for which he made a tour through the colony to report on its economic resources; and in the same year he was appointed director of the Geological Survey of New Zealand and of the New Zealand Colonial Museum at Wellington. There, or in his cottage on the Hutt, a few miles away, he lived for more than forty years. During the first half of this time he issued a long series of important contributions to the natural science of New Zealand; their range was wide, for he was director of the zoological museum, the botanical gardens, the meteorological observatory, and the colonial laboratory, as well as of the Geological Survey. He was also for many years Chancellor of the New Zealand University. He nevertheless found time for extensive original researches. He wrote papers on glacial geology, the origin of the rock basins and the volcanic history of New Zealand; his zoological researches were mainly on the Cetacea, seals, and fish, and he wrote on many groups of New Zealand fossils, notably the moas, and on the discovery of the oldest known penguin, Palæeudyptes. He superintended and edited those valuable series of annual reports issued by the Colonial Museum and by the Geological Survey, beginning in 1867, which are the great storehouse of information on New Zealand geology. In 1868 he married the eldest daughter of the late Sir David Monro, who was then Speaker of the New Zealand Parliament. In 1873 he issued a sketch-map of New Zealand geology, of which the edition issued in 1886, with his "Outlines of New Zealand Geology," is still the best available. In 1879 he compiled an official "Handbook of New Zealand," a work of reference of permanent value, of which a fourth edition was issued in 1886. In that year he also wrote his well-known report on the eruption of Tarawera; he maintained that it was not a normal volcanic, but a hydrothermal eruption, due to a vast explosion of the superheated steam with which the ground around Lake Rotomahana was saturated. This view has not been confirmed for the eruption of Tarawera as a whole, but it is probably correct for the particular explosion which blew up Lake Rotomahana and its famous pink and white terraces.

Hector's work had meanwhile gained world-wide recognition. He had been elected a Fellow of the