ton or Holland Park is conveniently situated for a University quarter passes comprehension.

It would be unfair to expect in the course of two lectures a full exposition of University policy; but there appears to be some lack of consistency, possibly more apparent than real, between the criticism of pre-1900 higher education in London when "each college made its own plans and did its own work in the best way it could" and the current demand that, a teaching University having at last been established, certain Colleges shall be given the status of "Dominions" enjoying Home Rule within the University. If University and King's Colleges were set up cheek by jowl on the Bloomsbury site, the need for co-ordination by some independent and impartial authority would cry out to heaven. The Provost is on surer ground in pleading for "as much concentration in the University Quarter as is practicable," especially in respect of "all the new post-graduate institutes," and our only criticism of this proposal is that a more comprehensive term than "post-graduate institutes" should be used. In addition to post-graduate institutes, there is need for a number of schools or institutes of a specialised character, *e.g.* for law, music, drama, journalism, and military science, to specify only a few subjects for which at present provision is not made or is inadequately made within the University. As an instance of a post-graduate institute, the new scheme for an Institute of Public Health is cited, and it is gratifying to find that the demand for Collegiate Home Rule is not in this case interpreted by the Provost in the sense of "what we have we hold." "We have a department [of Hygiene] in this College, the oldest in the country, but it is inadequate to meet the needs of London; and we should be prepared to see that department, and all the still smaller departments in the other Colleges, merged into one great institute. That is the kind of development which will be helped by the concentration in Bloomsbury."

Towards the conclusion of the lectures, the Provost pleads for "the necessary spirit to pull and work together" in order to substantiate the vision of a great University of London which he has somewhat faintly adumbrated. These wise words should not be received in a derisive spirit. No one will suppose that University College has attained its present great prestige without a struggle, or that on certain occasions its rivalry with other Colleges may not have taken a combative form. The important thing to ensure, as the Provost suggests, is that this rivalry, unavoidable and even desirable within limits, shall be as free as possible from selfishness—"particularism" is the polite academic word—with the greater glory of the University always in view, magnanimous, void of envy, malice, and intrigue, and of that perverted form of academic freemasonry which suspends private judgment and exalts College loyalty. The alternative is constant suspicion and bitter, often unreasonable, opposition to progress.

A brief reference must be made in conclusion to Mr. Fisher's speech delivered at the end of the second lecture. He found himself in "full agreement with the admirable doctrine contained in the address." The University of London was a species by itself.

"The Government, four years ago, made an offer of the Bloomsbury Site to the University of London. That offer has been accepted by the University. The Government do not propose to make another offer, and if the University does not like the site, well, it can return it to the source from which it came. I have no doubt the Chancellor of the Exchequer will appreciate its generosity."

The limit to the number of students who could be educated at Oxford and Cambridge had been reached, and London must be prepared to receive a great influx of students, particularly

"from the Dominions, from India, from the Crown Colonies, from the United States of America, and from the allied Powers of the Continent." You must concentrate in one part of London "not *all* the teaching power, but an impressive proportion of the teaching power," and that was "the principal object which the Government had in view in suggesting an arrangement under which King's College could be brought into close proximity with University College." And as last words he said: "Let those who are anxious for the future of London University, from whatever angle they may have hitherto viewed London University problems, let them concentrate on the endeavour to create upon the site a noble series of buildings, worthy of the reputation of the University, worthy of its past, and adequate to the great destinies which await it."

T. LL. H.

Antarctic Foraminifera.

British Museum (Natural History). British Antarctic ("Terra Nova") Expedition, 1910. *Natural History Report. Zoology*, Vol. 6, No. 2. *Protozoa*, Part 2: *Foraminifera*. By Edward Heron-Allen and Arthur Earland. Pp. 25-268 + 8 plates. (London: British Museum (Natural History), 1922.) 30*s*.

STUDENTS of natural history in its wider aspects will welcome the appearance of this memoir on the Antarctic Foraminifera of the second Scott Expedition—a notable contribution to the series of reports which have resulted from the *Terra Nova* Expedition. The authors state that the material collected during the expedition was placed in their hands seven years ago, and that the delay in publication has been due, not

only to the difficulties of biological research in war-time, but also to the method of preservation adopted for most of the dredgings containing foraminiferal specimens. The collectors appear to have put unwarranted confidence in formalin, "than which no more unsatisfactory medium for . . . Foraminifera can be imagined." Messrs. Heron-Allen and Earland have been compelled, therefore, to expend much time and trouble in cleaning the material entrusted to them so as to render it at all suitable for study, and they "can only review the results as a tantalising sketch of the possibilities which would have attended upon an ample supply of properly collected Antarctic material." Nevertheless, the authors are able to record 650 species and varieties of these fascinating Protozoa, of which 46 are new to science.

In looking through the systematic list, which occupies by far the greater part of the memoir, the student of distribution cannot but be impressed by the wide range of many of the types. Species recorded here from the far south are identical with those, already enumerated in lists by the same authors, of Foraminifera from the North Sea, and from the Atlantic waters around the shores of Conacht. Several types are common to Arctic and Antarctic regions, but these are almost all pelagic forms, and capable of the most extensive migrations. The only exception, *Globigerina pachyderma*, Ehrenberg, with its "curiously thick-walled" shell, is "the typical Globigerina of Arctic deposits," reaching its southern limit about the Faeroe Channel. Nevertheless, the authors do not consider that its presence in the Antarctic Ocean affords any support to the once-popular "bipolarity" theory of specific origins. Apparently *G. pachyderma* is "a local variation" of *G. dutertrei*, d'Orbigny, a transition from the one form to the other being clearly demonstrable as dredgings from more southerly stations are examined. This transition is supposed to be "induced by conditions of temperature," and the authors believe that "the same gradual transition [from *G. dutertrei* to *G. pachyderma*] which we have described in the Antarctic could be traced in the Arctic and temperate seas."

Systematic students of the Foraminifera will be especially interested in the number of hyaline species of which arenaceous isomorphs are described—for example, *Bifarina porrecta* (Brady), *Bolivina punctata*, d'Orbigny, and *Rotalia soldanii*, d'Orbigny. The authors express their agreement with Bütschli, Fauré-Fremiet, and other recent workers at the order, in considering that the existence of such isomorphs—the formation of an arenaceous instead of a calcareous test due to some obscure physiological reaction—may necessitateu ltimately a revision in the classification of the Foraminifera. "We do not think the time has yet arrived to abandon the generally accepted, if artificial, system of Brady, which, with some modifications, is followed in this Report. But we have endeavoured to clear the way towards a proper zoological allocation of the Lituolidæ by refraining wherever possible from the creation of new arenaceous species, and retaining our new arenaceous forms in the genera to which they naturally belong."

Among the newly described forms the genus Dendronina, referred to the Astrorhizidæ, comprising two New Zealand and two Antarctic species, is noteworthy. The test is built of fine mud, sand-grains, and sponge-spicules, and the sessile *D. arborescens* assumes a complex branching habit, attaining a height of 5 to 6 millimetres. The authors believe that the genus may be represented also in tropical seas (Indian Ocean). *Polytrema miniaceum* (Pallas) was found in great abundance in the New Zealand area, at one station "practically every solid organism" being "more or less covered with it." It is a sessile foraminifer of very wide range, and the authors have made a special journey to Corsica so as to study the species in life in Mediterranean waters. The organism in its early free stage settles on some object, wherewith it gains connexion by thrusting out protoplasm from its under surface and forming "a thin layer of incrusting chambers." The protoplasm subsequently streams out from these, surrounds the young spherical test, and constructs a wall of small chambers which overgrow and envelop the latter. Finally the characteristic branching, arm-like processes grow out. The occurrence of siliceous sponge-spicules inside the chambers of the Polytrema has given rise to much discussion; the authors have observed sponge and foraminifer "close together and approximately the same size," and do not altogether reject the possibility of a true symbiosis.

In order to reduce the cost of publication, the authors have restricted to a minimum their synonymic references. The eight plates illustrating the memoir have been admirably drawn by Mr. M. H. Brooks and are excellently reproduced. All the workers concerned may be heartily congratulated on the results made known in this most recent outcome of Antarctic exploration and research. G. H. C.

Water Underground.

Nouveau Traité des eaux souterraines. Par E.-A. Martel. Pp. 838. (Paris: G. Doin, 1921.) 50 francs.

IN M. Martel's treatise, stress is naturally laid on what he has styled "spelæology." For him, subterranean water moves in a fascinating world of caves. The conception of a general water-table in