

Museum and the Walker Art Gallery. The autumn exhibition will be open in September, and the Arts Committee propose to admit members of the British Association to the galleries during the week of the meeting on presentation of their tickets of membership.

A new museum, given to the zoological department of University College by the late Mr. George Holt, has been rapidly hurried on with the special view of use at this meeting, and will be available for the exhibition of specimens, models, &c., brought in illustration of papers read before the Sections, or for other objects of scientific interest sent on loan.

A number of the owners of works of manufacturing and engineering interest have offered to open their buildings for inspection during the week. Several gentlemen have intimated their intention of giving garden parties, and a number of excursions to places of interest in the neighbourhood of Liverpool have now been arranged, including the following: Half-day excursions on Saturday, September 19—(1) River excursion with the Mersey Dock Board; (2) Overhead Electric Railway; (3) Speke Hall, Hale Hall, &c.; (4) Thurston, Storeton Quarry (where the reptilian footprints are found), and the Leasowe Submarine Forest; (5) Bidston Observatory; (6) Chester and Hawarden; (7) Dredging excursion with the Lancashire Sea-Fisheries Steamer. Whole-day excursions on Thursday, September 24—(1) Chester and Eaton Hall; (2) Rivington Water Works, &c.; (3) Llandudno and Beaumaris by sea; (4) Manchester Ship Canal, &c.; (5) Prestatyn, Tremerechion Caves, and Corwen; (6) Northwich, Weaver Navigation, and Delamere Forest.

At the end of the meeting there will be longer excursions, extending over several days, to the Vyrnwy Water Works in Wales and to the English lakes; and a specially scientific excursion to the Isle of Man, for which a separate programme has been prepared, covering five days—Thursday to Monday inclusive.

The Earl of Derby has invited a party to Knowsley, the Duke of Westminster has also invited a party to Eaton Hall, and Mr. Gladstone will receive another party at Hawarden. In connection with the Isle of Man excursion, the Governor of the island (Lord Henniker) has invited the members to a reception at Government House, and will preside at a dinner to be given on the concluding evening.

The Publications Sub-Committee have drawn up a scientific handbook to Liverpool and the neighbourhood, containing articles on the history and antiquities, the geology, the entomology, the marine biology, the botany, the vertebrate fauna, the climate, the river and the tides, the docks and other engineering works, the trade and commerce, and the chemical industries. A complete guide to the various excursions is also in course of preparation.

The Hospitality Sub-Committee have invited as guests a large number of distinguished scientific men from the continent and America, and although many have not yet been able to give, at this early date, a decided answer, a considerable number have already definitely accepted. These include, amongst others, Prof. van Rijckevorsel (Rotterdam), M. J. Violle (Paris), Prof. V. Bjerknes (Stockholm), Prof. Lenard (Aachen), M. L. de la Rive (Geneva), Prof. Knorr (Jena), Dr. Credner (Leipzig), Prof. Renard (Gand), Prof. Mœbius (Berlin), Prof. Julin (Liège), Prof. Gilson (Louvain), Prof. Minot (Boston), Prof. Le Conte (Berkeley), Graf von Pfeil (Vienna), Prof. Cohn (Göttingen), Prof. Stainier (Gembloux), Prof. Schröter (Munich), Prof. Topinard (Paris), Dr. E. Dubois (Hague), Prof. C. Bohr (Copenhagen), Prof. Goldmann (Freiburg), Prof. Schimper (Bonn), Prof. Zacharias (Hamburg), and M. C. de Candolle (Geneva). As a number of others are still uncertain, and answers are now coming in every day, this can only be regarded as a provisional list. Probably the attendance of foreigners at this meeting will be unusually large. The Hospitality Sub-Committee is now busily engaged in arranging private

hospitality for the foreign guests, and also for as many as possible of the home members of the Association who have intimated their intention of being present at the meeting.

W. A. HERDMAN.

### THE DAVY-FARADAY RESEARCH LABORATORY.

SCIENTIFIC investigators have long needed a central laboratory where researches can be carried on without interruption, and have urged the establishment of a national physical laboratory for the United Kingdom. Twenty years ago the Duke of Devonshire's Commission recognised the advantages which our national industries would derive from physical and chemical investigations, and pointed out the need of a more generous recognition of such research by the State. Since then the Physikalische Reichsanstalt, at Charlottenburg, has been established, and, through the facilities it offers, Germany is reaping a rich harvest of natural knowledge; but, so far as State recognition is concerned, we have made little advancement. True, a Committee of the British Association has considered the question of a national physical laboratory, and another Committee is now reconsidering it; but there is no immediate prospect that any recommendations they might make will induce the Government to give a substantial grant, either for the extension of an existing institution in the direction of facilities for research, or for the establishment of an institution on the lines of the Reichsanstalt. For the perspicacity which sees in pure scientific research a means of developing industries, and which is content with knowledge accumulated, whether the practical bearings are apparent or not, we have to go to Germany, where many of our national industries have gone as a consequence of neglect by our Government.

Fortunately for British science, individuals occasionally arise who see how severely investigation is handicapped on account of the lack of organisation and encouragement by the State. One such benefactor is Dr. Ludwig Mond, whose munificent gift to the Royal Institution of a laboratory for physical and chemical research was warmly announced in these columns two years ago. We are now able to state that on June 12 Dr. Mond formally transferred to the managers of the Royal Institution the freehold of No. 20 Albemarle Street, adjoining that Institution, for the purpose of the laboratory of research in pure and physical chemistry referred to in our announcement, to be known as the Davy-Faraday Research Laboratory of the Royal Institution. In order to make the building suitable for this purpose, Dr. Mond has carried out very extensive alterations. He has also equipped the laboratory with the necessary apparatus, appliances, &c., for carrying on delicate investigations in physical and chemical science. An idea of the generous nature of Dr. Mond's endowment may be obtained from a statement of rooms included in the new institute.

The Laboratory contains:—

*On the Basement.*—A room for thermochemical research; a room for pyrochemical research; mechanics' workshop; room for electrical work; battery of twenty-five accumulators; constant temperature vaults; boiler-house and store-rooms.

*On the Ground Floor.*—A room for research in organic chemistry; a room for research in inorganic chemistry; a fire-proof room for experiments in sealed tubes; a balance room; entrance hall and cloak-room.

*On the First Floor.*—The Honorary Secretary's room; a large double library connected with the library of the Royal Institution.

*On the Second Floor.*—A museum of apparatus.

*On the Third Floor.*—Seven rooms for research in physical chemistry.

*On the Fourth Floor.*—A room for inorganic preparations; a room for organic preparations; a photographic room; four rooms for researches in physical chemistry.

*On the Roof.*—An asphalted flat with a table, gas and water.

All the floors are connected by a hydraulic passenger-lift.

Dr. Mond has not only furnished the laboratory with the most modern instruments and appliances for researches in pure and physical chemistry, but he has also placed in the hands of the managers of the Royal Institution an ample annual endowment, so that the laboratory may be maintained in a state of thorough efficiency, the object of the donor being to give every assistance and encouragement within the limits of the endowment to scientific workers.

The laboratory (the affairs of which will be managed by a Laboratory Committee appointed by the managers of the Institution) will be under the control of two directors, who will be aided in the work by competent assistants. The managers of the Royal Institution have appointed as directors Lord Rayleigh and Prof. Dewar.

It is intended to open the laboratory for work by the middle of October. The trust deed provides that no person shall be admitted to the laboratory as a worker who has not already done original scientific work, or in the alternative, who is not, in the opinion of the Laboratory Committee, fully qualified to undertake original scientific research in pure or physical chemistry; and that no person shall be excluded from admission by reason of his or her nationality or sex.

Admission to the laboratory, and the supply of gas, water and electricity, as far as available, will be free of charge; but any person using the apparatus, will be responsible for any damage done while in his possession.

Applications for admission are to be made to Mr. Robert L. Mond, Honorary Secretary to the Laboratory Committee, at 20 Albemarle Street.

The conditions of Dr. Mond's endowment are as liberal as the gift itself, and we have no doubt that the results which will follow will demonstrate the importance of both as means of advancing science. We regard the foundation of the laboratory as marking a most important step in the history of British science; for it provides a means whereby the edifice of scientific knowledge can be built up by master hands. British Governments are said to base their assistance to science mainly on the principle of helping voluntary effort. Perhaps, now that Dr. Mond has shown what can be done, the Government will show its interest in science by establishing a similar laboratory of a national character.

#### BORING A CORAL REEF AT FUNAFUTI.

LETTERS have just come to hand from Prof. Sollas stating that he has started from Sydney to carry out the project of putting down a boring through the atoll of Funafuti. By this time, if all has gone well, the expedition has probably started work.

It may be remembered that about six years ago, a strong committee was formed by the British Association, with Prof. Bonney as its chairman, and Prof. Sollas as secretary, "to investigate a coral reef by sounding and boring." The intention was to carry out the suggestion made by Darwin in his book on "Corals and Coral Islands," and to put to the test of fact the rival theories on the origin of these extraordinary limestone masses. After some years of preliminary thought and suggestion, a definite project began to take shape in 1894, when an application for a grant was made to the Government Grant Committee. The outcome of this was an application to the Admiralty for the service of a surveying vessel, which was most generously given

for May of this year, and grants of money in aid were made by the Government Grant Committee and the Royal Society itself. A smaller executive committee of the latter body was formed, including the following names: Prof. Bonney (chairman), the President and Officers of the Royal Society, Mr. Wolfe Barry, Mr. Crookes, Mr. F. Darwin, Prof. Edgeworth David, Captain Field, Sir A. Geikie, Prof. Judd, Dr. J. Murray, Prof. Anderson Stuart, Admiral Wharton, with Prof. Sollas and Mr. W. W. Watts (secretaries), and preparations were concluded for making a start in time to leave Sydney in H.M.S. *Penguin* on May 1, under the command of Captain Field.

Meanwhile Prof. Anderson Stuart, of the University of Sydney, whose sympathy had been enlisted, entered warmly into the proposal. He took immense trouble in discussing with missionaries, sailors and travellers, the prospective merits of a large number of islands for the purpose of the investigation. Further he obtained from the Department of Mines in New South Wales the loan of a valuable set of diamond-drilling plant, and used his influence to overcome the natural difficulties which presented themselves in obtaining permission to use such apparatus on a waterless island in the Pacific. The committee is greatly indebted to this gentleman and to Mr. W. H. J. Slee, the Chief Inspector of Mines and Superintendent of Diamond Drills to the Government of New South Wales, for all the care and trouble they have taken in selecting the machinery and stores for this purpose, in engaging for the use of the expedition some of the most experienced foremen in the colony, and in obtaining a contribution towards the wages expense of the expedition.

Prof. Stuart's recommendation of the Island of Funafuti agreed with Admiral Wharton's knowledge of the island and the group to which it belongs, and it fortunately happened that further sounding and exploring of the group would furnish results of use to the Admiralty, so that a topographical and magnetic survey, together with sounding and current observations, could be carried on while the boring was being executed in the island.

Prof. Edgeworth David, from the University of Sydney, happened to be visiting England while preparations were in progress, and he furnished a most valuable means of communication with helpers in Sydney; and through this fortunate circumstance, the committee was able to come into closer touch with the Sydney committee in order to provide more completely for the regular work and such emergencies as could be foreseen. It was hoped that either Prof. David, or Mr. Pitman, the Government Geologist of New South Wales, would be able to take part in the expedition, but unfortunately neither gentleman could arrange to be away at the time requisite. Mr. Hedley, from the Australian Museum, has, however, been able to go, and he will utilise his opportunities for collecting and making observations in natural history.

Prof. Sollas, who is sent out by the committee in chief charge, will regard the boring work as the principal aim of the expedition, and will only be able to utilise his spare time in any other work. All of his observations, however, he intends to devote to the primary object of elucidating the structure and origin of the reef. It is therefore a good thing that Mr. Stanley Gardner, an enthusiastic Cambridge naturalist, has been able to accompany him, and he purposes to devote himself to biological work of such a nature as to bear directly on the origin and growth of reefs.

Funafuti is a typical atoll, submerged for the most part on its western side, but above water for a long strip on its eastern side. It is about fifteen miles in circumference and about seven miles in longest diameter, is one of a group of atolls situated due north of the Fiji group, and is about in latitude 10° S., and longitude 179° E. The