

or shorter prominent algæ should be kept and noted, and crusts on such examined and preserved, with notes of the vessel's course.

33. Various instances have been mentioned by travellers of the coloration of the sea by minute algæ as in the Straits of Malacca by Harvey; any case of this kind would be worth especial attention.

34. The calcareous algæ (*Melobesia*, &c.) are comparatively little known, and are apt to be overlooked.

35. Fresh-water algæ should be collected as occasion presents. Prof. Dickie states that they may be either dried like the marine kinds, or preserved in a fluid composed of 3 parts alcohol, 2 parts water, 1 part glycerine, well mixed.

36. Cases are recorded of the presence of algæ in hot springs. If such are met with, the temperature should be noted and specimens preserved.

#### IV. Zoological Observations

As the scientific director of the expedition is an accomplished zoologist, and has already had much experience in marine exploration, it will suffice to offer a few suggestions under this head.

The quadrant-like zone of the Pacific, which separates the northern and eastern boundaries of the Polynesian Archipelago (using "Polynesia" in its broadest sense as inclusive of "Micronesia") from the coasts of N. Asia and America, is as little explored from the point of view of the physical geographer as from that of the biologist. It would be a matter of great importance to examine the depth, and the nature of the deep-sea fauna, of this zone by taking a line of soundings and dredgings in its northern half (say between Japan and Vancouver) and in its eastern half (say between Vancouver and Valparaiso). If practicable, it would further be very desirable to explore the littoral fauna of Waihou, Easter Island, or Sala y Gomez, with the view of comparing it critically with that of the west coast of South America.

If H.M.S. *Challenger* passes through Torres Straits, it will be very desirable to examine the littoral fauna of the Papuan shore of the straits in order to compare it with that of the Australian shore. The late Professor Jukes, in his "Voyage of the *Fly*," many years ago, directed attention to this point and to its theoretical bearings.

The hydrographic examination of "Wallace's line" in the Malay archipelago, and of the littoral faunas on the opposite sides of that line, is of great importance, considering the significance of that line as a boundary between two distributional provinces. An additional interest has been given to the exploration of this region by Capt. Chimm's recently obtained sounding of 2,300 fathoms in the Celebes Sea, the mud brought up being almost devoid of calcareous organisms, but containing abundant spicula of sponges and radiolaria.

The light from any self-luminous objects met with should be examined with a prism as to its composition. The colours of animals captured should also be examined with a prism, or by aid of the microscopic spectroscope.

#### V. Concluding Observations

Attention should be paid to the Geology of districts which have not hitherto been examined, and collections of minerals, rocks, and fossils should be made. Detailed suggestions as to the duties of the geologist accompanying the expedition are unnecessary; but it seems desirable that at all shores visited, evidence of recent elevation or subsidence of land should be sought for, and the exact nature of these evidences carefully recorded.

Every opportunity should be taken of obtaining photographs of native races to one scale; and of making such observations as are practicable with regard to their physical characteristics, language, habits, implements, and antiquities. It would be advisable that specimens of hair of unmixed races should in all cases be obtained.

Each station should have a special number associated with it in the regular journal of the day's proceedings, and that number should be noted prominently on everything connected with that station; so that in case of labels being lost or becoming indistinct, or other references failing, the conditions of the dredging or other observations may at once be forthcoming on reference to the number in the journal. All specimens procured should be carefully preserved in spirit or otherwise, and packed in cases with the contents noted to be dealt with in the way which

seems most likely to conduce to the rapid and accurate development of the scientific results of the expedition.

A diary, noting the general proceedings and results of each day, should be kept by the scientific director, with the assistance of his secretary; and each of the members of the scientific staff should be provided with a note-book in which to enter from day to day his observations and proceedings; and he should submit this diary at certain intervals to the scientific director, who would then abstract the results, and incorporate them, along with such additional data as may be supplied by the officers of the ship, in general scientific reports to be sent home to the hydrographer at every available opportunity.

The scientific staff should be provided with an adequate set of books of reference, especially those bearing on perishable objects.

#### SCIENTIFIC SERIALS

A LARGE portion of the *American Naturalist*, for October, is occupied by Prof. Asa Gray's address at the Dubuque meeting of the American Association for the Advancement of Science, to which we have already alluded. Mr. B. Pickman Mann then concludes his paper on the white coffee-leaf miner (*Cemeostoma coffeelum*), a subject of great importance to coffee-growers, treated in an exhaustive manner. Prof. C. F. Hartt, from whom articles on the same subject have already appeared in the *Naturalist*, contributes a further paper on the occurrence of Face-urns in Brazil; and Prof. N. S. Shaler concludes his article on the Geology of the Island of Aquidneck, illustrated by maps and sections; and Mr. C. V. Riley his important article on the cause of Deterioration of Grape-vines.—The November number commences with an article by Mr. J. G. Henderson on some aboriginal relics known as "plumets," which are abundant in various parts of the United States from the Atlantic to the Pacific, with speculations as to their use. Prof. James Orton continues his contributions to the Natural History of the Valley of Quito, the present article being devoted to the Articulata and Plants; in the latter department the author notices the similarity of the features of the flora of the Andes to those recorded by Kerner in the Tyrolean Alps. Mr. R. Ridgway commences some Notes on the Vegetation of the Lower Wabash Valley, with an account of the Forests of the Bottom-lands. Mr. Samuel H. Scudder, in an article on Fossil Insects from the Rocky Mountains, records nearly 40 species, belonging to nearly all the principal groups, found in Tertiary deposits. Prof. Cope, in a paper read at Dubuque, discusses the geological age of the Coal of Wyoming, which he refers without doubt to the Cretaceous period. Prof. Shaler has a short note on the effects of extraordinary seasons on the distribution of Animals and Plants.—In the number for December we find a short article by the Rev. Samuel Lockwood on the Baltimore Oriole and Carpenter-bee, followed by a continuation of Mr. Ridgway's notes on the Vegetation of the Lower Wabash Valley, treating of the Peculiar Features of the Bottom-lands. This is followed by an interesting account of the Alpine Flora of Colorado, by the Rev. E. L. Greene; and Dr. J. W. Foster then contributes an abstract of a paper read at Dubuque on certain peculiarities in the Crania of the Mound-builders, illustrated with drawings. Another Dubuque paper of a speculative character is by Dr. H. Harts-horne, on the relation between organic vigour and sex; and Prof. Shaler then gives a further instalment of his paper on the Geology of Aquidneck. In all these three numbers is the usual amount of Reviews, and interesting short paragraphs and notes.

#### SOCIETIES AND ACADEMIES

##### LONDON

Royal Society, Jan. 23.—Dr. Stenhouse read a paper, "Contributions to the History of the Orcins.—No. III. Amido-derivatives of Orcin." He has confined his investigations to an examination of the products obtained from Trinitro-orcinic acid.

*Amido-diimido-orcin*,  $C_7H_5(NH_2)(NH)_2O_2$ .—This compound, which has the properties of a base, is formed by the oxidation of triamido-orcin, and is most conveniently obtained in a pure state by decomposing a solution of the acetate with a slight excess of ammonia. The most advantageous method of preparing the base is to reduce trinitro-orcin with sodium-amalgam, and to