

balance in hand, when all expenses are paid, is considerable. We do not wish to be misunderstood when we express our opinion, founded upon personal observation, that a large proportion of those who attend the summer excursions look upon them as merely pleasant afternoon rambles, and that of those who patronise the *soirées*, many go as they would to any other entertainment, without the slightest interest in Natural Science. There are good workers at Manchester—men, who from early youth have been strongly imbued with a love of nature, and who have done, and are doing, good service to science; and to their influence must be attributed the good effects which such a body certainly produces in spite of drawbacks. But, under the circumstances, it appears to us that instead of the somewhat lengthy, though interesting report, which is issued annually, containing detailed notices of the localities visited and papers read, which will be of little value to posterity, lists of the natural productions of the district, similar in plan to that published by the Folkestone Society, should be issued. One such list—that of the Mosses, by Mr. G. E. Hunt—appeared in 1864; and if only on the ground of showing that some real work is done, and of allowing the workers “fair play,” a portion of the funds should certainly be devoted to the placing on permanent record, for the benefit of future observers, complete lists of the flora and fauna of the district. More especially at Manchester is such a record needed, inasmuch as the Committee advocate the establishment, “in places where they are likely to become permanently established,” of plants foreign to the district, and of freshwater mollusca. This suggestion appears to us, under any circumstances, unadvisable; and unless some record is kept of such introductions, it must, if carried out, prove both misleading and injurious.

Those who contemplate the establishment of a field-club on a small scale will do well to content themselves with moderate beginnings. The subscription should be low—say 2s. 6d.; patronage should not be sought, but rather discouraged; and every pains should be taken to show that no class distinctions would be considered of the slightest importance in matters connected with Natural History. In one society, with which we were intimately connected, we well remember the difficulty we had to convince an intelligent working man, with a genuine love for science, that he was a welcome addition to our ranks; and it is only by judicious management that such can be induced to co-operate with those who are considered their superiors.

The High Wycombe Natural History Society, another of those which has aimed at popularising science, holds monthly evening meetings during the winter at the houses of some of the principal members. These meetings partake somewhat of the nature of a *conversazione*; tea and coffee are handed round, papers are read, objects displayed, and the evening concludes with an exhibition of the microscope. Despite all care, however, the intention of these gatherings has been somewhat lost sight of, and they have grown to be looked upon as mild forms of dissipation. To remedy this, the plan is to be adopted of holding fortnightly, between the general meetings, instruction classes, which only those who are willing to work are expected to attend. Each of these will last from

an hour to an hour and a half, and be devoted to some one special point; and the benefit resulting from this arrangement seems likely to be considerable.

A great point to be remembered by those who are engaged in organising a local Society is that it is by no means to be desired that a large number of members should be enrolled; in fact, when once the body is established, and its existence generally known, we would solicit no one to join it. Those who really care for the thing, and are therefore likely to be useful members, will come forward readily enough to lend a helping hand; but those whose assistance has to be sought will probably be of but little use, even if it be obtained.

The subject of local museums in connection with Natural History Societies is now exciting some attention; and we have intelligence of the recent establishment of one at Folkestone upon what seems to be a satisfactory basis.

THE PHYSIOLOGICAL LABORATORY AT LEIPZIG*

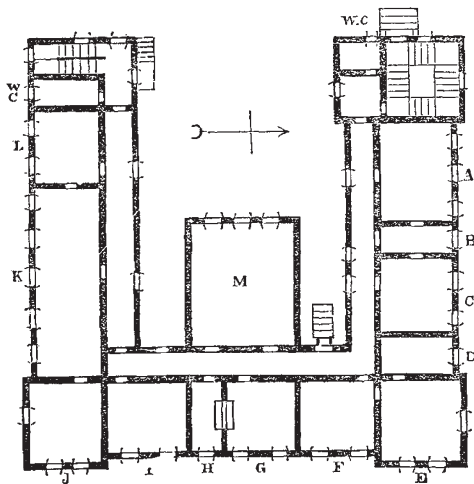
SINCE in England we have absolutely no physiological laboratory open to students, an account of the best in Germany (there are many others) will be interesting to the public. Perhaps some day the University of Oxford may think it desirable to erect such a laboratory to match that recently provided for Experimental Physics. There is plenty of money which the colleges could use for this object, if once they were freed from the old restrictions by the aid of the Government.

“The physiological laboratory, where I am at present working, owes its existence to the energy of Prof. Carl Ludwig, and to the liberality of the Government of Saxony. As it is universally acknowledged to be the most complete establishment of the kind in Europe, it seems to me to merit a somewhat detailed description. The building, as may be seen by the annexed plan, has somewhat the form of a horseshoe, with a small projecting portion in the middle, where the lecture-room is situated. The dimensions are—on the north and south sides, 119ft. 2in.; on the east side, 121ft. 11in. The right wing of the building constitutes the microscopical department, the left the chemical department of the laboratory, while the central portion is devoted to the study of experimental physiology in the narrower sense of the word.

“To describe the rooms more minutely. Room A is arranged for the accommodation of beginners in the study of microscopy, and is furnished with boxes that contain the microscopes, and a large ground-glass tablet, by means of which the lectures on microscopy are illustrated with drawings in coloured chalk. Room B is the private study of the assistant in microscopy. Room C is intended for more advanced students in microscopy, and contains an injecting apparatus, by means of which three different fluids can be injected simultaneously under any required pressure and for any length of time, while the injection mass and the tissue to be injected are heated over a water bath. Room D contains a small library, consisting of such books as are most needed for constant reference. Room E is furnished with glass cases, in which physiological apparatus is kept when not in use. As a rule, no experiments

* From the *Boston Medical and Surgical Journal*. Letter from Dr. H. P. Bowditch.

are performed in this room. Rooms F, G, and H are devoted to experimental physiology, and are furnished with operating tables, with bellows attached for keeping up artificial respiration on curarised animals, registering apparatus of various sorts for recording the pressure of the blood, water baths where any required temperature may be kept up indefinitely, an injecting apparatus like that in the microscopical department, evaporating closets, glass cases for apparatus, &c. Between Rooms G and H is a small closet arranged for observations with the spectroscope. Room I is the chamber where all experiments are performed which require the use of large quantities of quicksilver. It contains two quicksilver pumps for extracting gases from fluids, instruments for measuring the activity of the respiration in man and the lower animals, &c. Room J is divided into two portions, one of which is used



for a weighing room, and the other for experiments in acoustics. Rooms K and L contain, besides the ordinary furniture of chemical laboratories, the ingenious air-pump of Bunsen, by which the process of filtering is so greatly accelerated. The lecture room, M, accommodates about one hundred students. Tables running on a small railroad in front of the seats, enable the lecturer to demonstrate his experiments very conveniently. The room is lighted from above as well as from the side, and if necessary, can be darkened completely for optical experiments. In the basement of the building is a small gas-engine of about one-horse power, which drives the respiration apparatus, registering instruments, &c. In the basement are also the rooms where the animals are kept (one room being devoted entirely to frogs), a chamber furnished with refrigerators for performing chemical experiments, where a low temperature is required, a chamber containing furnaces for fusion, a workshop, store-rooms, &c.

"The second story of the building contains the rooms of Prof. Ludwig and his family, and those of other persons connected with the laboratory. In the court-yard is a small building containing the necessary arrangements for experimenting on horses and other large animals. Here, also, are an aviary and a small fish-pond.

"Besides the permanent and stationary apparatus already described, the laboratory is well supplied with all sorts of instruments for physiological experiments, and new appa-

ratus is constantly ordered for special investigations. There is also a very skilful mechanic living in the laboratory, whose duty it is to make alterations or repairs in the apparatus as circumstances may require.

"Prof. Ludwig directs personally all the work done in the laboratory, devoting his whole time to the superintendence of his pupils, and making no independent investigation. Each of the pupils, at present nine in number, makes, under the direction of the Professor, a series of experiments with a view of settling some special point in physiology. The results arrived at are published at the end of the year, sometimes under the names of the Professor and pupil together, and sometimes under that of the pupil alone. The whole work of the laboratory forms every year a pamphlet of 150 to 250 pages.

"Prof. Ludwig lectures five times a week on physiology, and his assistants, viz., Prof. Schweigger-Seidel in microscopy, Dr. Hüfner in chemistry, and Dr. J. J. Müller in physics, also lecture on their specialties, besides superintending the work done in their respective departments.

"It will thus be seen that abundant facilities are here offered, not only for learning the existing state of physiological science, but also for becoming familiar with the manner in which physiology is at present studied in Germany. The patient, methodical, and faithful way in which the phenomena of life are investigated by the German physiologists not only inspires great confidence in their results, but encourages one in the hope that the day is not far distant when Physiology will take its proper place as the only true foundation of Medical Science.

"H. P. BOWDITCH."

Dr. Bowditch adds to this in a private note that *all* expenses, even down to the frogs used for experiments, are borne by the Saxon Government; so that the institution is absolutely free of charge to the student. Professor Ludwig welcomes to the laboratory any student—provided there is room for him—whether German, English, French, or Russian, who is desirous and capable of original investigation.

PALÆONTOLOGY OF MAN

Précis de Paléontologie Humaine. Par le Docteur E. J. Hamy. 8vo. (Paris, 1870. London: Williams and Norgate.)

M. HAMY'S *Palæontology of Man*, written with the view of bringing the results of recent discovery to bear on the antiquity of our species, is a most important contribution to the rapidly increasing literature of prehistoric archæology. It is intended to serve as an appendix to Sir C. Lyell's great work on the subject, and treats only of palæolithic man to the exclusion of the three newer prehistoric ages. M. Hamy has classified his materials with judgment and caution, and has collected into a small compass most of the statements on record of the existence of man in the geological past, with a running criticism, which sometimes admits, and at other times rejects, the testimony. He stands almost alone among his countrymen in attaching no importance to the reputed discovery of the famous Moulin Quignon jaw, and in allowing that the circumstances under which it was found were, to say the least, very equivocal. His book, in a word, is so good that I propose to draw attention to a few of the weak rather