

THE STUDY OF A GENUS OF LAND  
SNAILS.<sup>1</sup>

THE Rev. J. F. Gulick, in an important paper published by the Linnean Society in 1873, described the distribution of the land snails belonging to the family Achatinellinæ that are found in the Hawaiian islands, and pointed out that neighbouring valleys in these islands, although presenting the same environmental conditions, are inhabited by distinct species. He regarded this as an example of a diversity of evolution under one set of external conditions which was rendered possible by isolation in the different valleys.

Darwin had stated in "The Origin of Species" that isolation is an important element in the modification of species through natural selection. But if the environmental conditions in the localities inhabited by distinct species are in all essential respects the same, natural selection takes no part in the evolution of species, and we must assume some inherent tendency to evolution, some *vis a tergo* which works along definite lines of divergence independently of external conditions. The question is one of very great importance, and further investigations both on the variations of the shells and on the conditions of their environment were greatly needed. In the magnificent memoir before us Prof. Crampton supplies the materials for reopening the discussion.

*Partula*, belonging to the family Bulimulidæ, is one of the genera of snails, confined to certain islands in the South Pacific Ocean, which show a distribution of distinct species in adjacent valleys similar to that of the Achatinellinæ in Hawaii.

The author has collected and examined an enormous number of shells, has personally studied the habits of the snails in their localities, and has put together his copious notes on the vegetation, meteorology, and topography of the islands. The present volume deals only with the species of Tahiti, but we are promised further volumes on the species of the genus from other localities.

As a detailed study of a single genus, however, this volume is the most complete of anything of the kind that has yet been attempted, and we may congratulate the author on the conclusion of this the first stage of his most laborious task.

To illustrate his study of the local conditions, we are provided with a large number of maps and sketches of a topographical model of the island, with many excellent photographs of the vegetation, and with tables of temperature and rainfall; and to illustrate the species he describes there are fifteen excellent coloured plates. For each of the species and varieties of the species in the island the author gives us the mean value of the measurements of the shells and of the apertures of the shells, together with the standard deviation, and in many cases the results are plotted out in frequency polygons.

Limitations of space do not permit further reference to the details given in this very laborious piece of work—a work which will prove essential to those who are interested in the problem of the differentiation of species.

It may be disappointing that the author does not state more decisively what his conclusions are from this elaborate study, but, although the material is already so extensive, it is perhaps wise, on his part, to delay his statement of conclusions until the series of memoirs is completed. It is clear, however, that the author is convinced that differences of environmental conditions cannot be held responsible for the differentiation of the species and varieties. In dealing with the widely spread species, *Partula otaheitanæ*, for example, he says that "the rôle of the environment is to set the limits to the habitable areas, or to bring about the elimination of individuals whose qualities are otherwise determined—that is, by congenital factors"; but, of course, there is no suggestion as to the cause of the change or diversity of the congenital factors.

The facts that are given in various chapters which seem to have a bearing on Mendelian inheritance are, as the author admits, not very satisfactory. Breeding experiments on an extensive scale can alone determine whether there is in *Partula* a Mendelian segregation similar to that described by Lang in *Helix*. The evidence of the occurrence of mutations, also, other than the dextral-sinistral mutation, which does not, as a rule, help to differentiate species, is not by any means conclusive.

It seems quite possible that, with the wealth of species, sub-species, and varieties which this memoir reveals and illustrates, the conclusion may be drawn that, after all, the genus *Partula* may afford an example of the evolution of species by the accumulation of small variations, although the cause of this accumulation still remains a mystery.

S. J. H.

CONTINUATIVE EDUCATION AND ITS  
OBJECTS.

A COMMITTEE of Scottish teachers, chosen from all branches of school education, has recently issued a report entitled "Reform in Scottish Education,"<sup>1</sup> which covers a wide field and embraces a large variety of topics. Many of the reforms advocated have already been set forth by others, and, in particular, by the Workers' Educational Association. In common with the latter body, the Scottish committee recommends the raising of the leaving-school age of the primary school to fifteen years; the reduction of the size of classes, so that every teacher shall have not more than forty pupils under his charge at any one time; and the establishment of day continuation schools, to which all shall be compelled to go from fifteen to eighteen, unless they are already in attendance upon a course of secondary instruction. The committee also demands the abolition of the

<sup>1</sup> "Studies on the Variation, Distribution, and Evolution of the Genus *Partula*." By Prof. H. E. Crampton. Pp. 342+34 plates. (Carnegie Institution of Washington, 1916.) Price 15 dollars.

<sup>1</sup> Report of the Scottish Education Reform Committee. (34 North Bridge, Edinburgh.) Price 1s. net.



huge "factory" school, found so often in our large towns, and would limit the enrolment so that no school should accommodate more than 600 pupils.

These reforms, it is declared, would tend not only to the efficiency of education, but also to the betterment of the teacher's position as regards both emoluments and social status. But the fallacy underlying a large number of the propositions laid down in a more or less arbitrary manner (for there is little or no attempt made to adduce reasons for the changes advocated) is that education may be improved by a mere extension of time. Education is at present compulsory in Scotland until fourteen years of age, and even then a considerable percentage of the children in attendance fail to attain any satisfactory standard in the "three R's." Extend this by one year, and all will be well. It seems never to have occurred to the committee that a change in the methods of elementary education might bring about better results than the present, even at the earlier age. The object of education is to supply the child with ideas which shall be instrumental in after life, and these instruments can be intelligently and efficiently used just in so far as the child understands not only the instrument, but also the principles upon which it has been constructed.

Now, few teachers realise the instrumental character of ideas, or that the activity of knowing arises either to satisfy a need or to meet a new situation, and that the failure of education is due largely to the neglect of these considerations. To take an example: If the continuation school, on the technical side, is to achieve its object, it must provide opportunities for the meeting and solving of the real situations and problems of the workshop. If this is borne in mind, then it must be obvious that continuation schools can be instrumental in solving only a limited number of the real problems which arise in life, and that in many cases a boy or girl will obtain the best technical education in learning how to meet the situations which arise from real work. The boy, e.g., whose desire is to become a fisherman will obtain the best training by his daily work, and will benefit little by being compelled to attend a continuation school until eighteen years of age. Rather, he will probably waste his time, and so render himself less fit for his daily avocation; and if we go on, we shall come to other exceptions, and find that, like all general rules, the particular principle that all boys and girls should be compelled to attend some kind of school until eighteen is too wide to be of any practical value in solving the real problems of life and of education.

A somewhat similar fallacy arises from the demand made for more science teaching in schools. Because science deals with realities in contrast to the humanities which are said to deal only with ideas, therefore education in science will be real because it deals with realities. But real problems, real situations, are often absent in the teaching of science in schools. A boy learning chemistry may throughout deal with realities, and yet never be called upon during his course to solve a real

problem, since for him the need never arises. Generally we must ever keep in mind that education is taking place only when our pupil is "thinking"; that thinking arises only when there is some problem to solve, some new situation to meet, or some obstacle to remove; and that when these conditions are absent all instruction becomes, and must become, mere unintelligent memorising, which develops neither the intellectual powers nor the ability to meet the after demands of life.

In conclusion, the one reform needed at present is to form a clear idea of what education really is—to understand that it takes place only when our pupils are being trained to think out solutions to real problems, or to devise means to meet real situations. Thereafter we may fruitfully discuss the agencies best fitted to attain this end, and, as a consequence, we may be less chary of believing that a new earth is to be attained by the extension of the leaving-school age and by the compulsory school education of all until eighteen. We may even doubt whether "compulsory" education is education at all.

A. D.

#### NOTES.

THE death is announced, at seventy-three years of age, of Prof. A. J. F. Dastre, director of the laboratory of animal physiology at the Sorbonne, and a member of the Paris Academy of Sciences.

WE regret to see the announcement of the death on October 18, in his eighty-ninth year, of Prof. Edward Hull, F.R.S., late Director of the Geological Survey of Ireland, and professor of geology in the Royal College of Science, Dublin.

MR. W. B. WORTHINGTON, who was elected president of the Institution of Civil Engineers at the last annual general meeting, has resigned the position from reasons of health, and Mr. H. E. Jones, a vice-president, has been nominated president for the year 1917-18.

AT a meeting of the Royal College of Physicians of London, held on Thursday, October 18, the Baly medal, for physiological work, was presented to Prof. W. M. Bayliss, and the Bisset-Hawkins medal was given to Sir Arthur Newsholme, in recognition of his efforts for the advancement of sanitary science.

THE death is announced of Sir John Prichard-Jones, Bart., principal of the firm of Messrs. Dickins and Jones, the London drapers. He took an active interest in higher education in Wales; he was treasurer of the Welsh National Museum, and a member of the council of the North Wales University College, Bangor, of which he was senior vice-president from 1909 to 1913. The University of Wales conferred upon him the degree of LL.D.

ON the occasion of the recent Glasgow meeting of the Refractory Materials Section of the Ceramic Society, the council appointed two sub-committees (with power to co-opt additional members) to prepare reports respectively on (1) standardisation of methods of testing, (2) refractories for spelter furnaces. It is anticipated that the former will be ready for the spring meeting in Sheffield, and the latter for the following autumn meeting at Cardiff.

WE learn from the *Times* that Mr. Walter Long has appointed Sir Boverton Redwood, Bart., Director of Technical Investigations in the recently created