unfathomable abyss separates subjects from the intelligent citizen, just as long ago the specialist expert in fact the eminent support on which his success so much depends.

The study of systematic and formal zoology and botany may seem superfluous to the physiologist, histologist and technical specialist who can content to contribute their mite to the general fund — a not, necessarily ambitious — but to those who aspire to solve the problems and master the principals of biology a broader view is necessary — a view that can come only to those who possess an intimate personal acquaintance with the interrelations of living species and the nature and extent of their modifications — for how is it possible to form a clear conception of the operations of natural selection, of the effects of environment on species, of the transmission of acquired characters, of special adaptations, fortuitous variations and so on, without first knowing something of the species themselves? It is very true a few section-cutting physiologists, possessed of specialistic minds, have evidenced no more the details of philosophic biology, but it would be impossible to overlook their productions with those of such naturalists as Humboldt, Darwin, Huxley, Wallace, Haeckel, Agassiz, Byars, Cope, Hill, Allen or Wood.

In order to avoid the possibility of being misunderstood, I wish to reiterate what has been already said in substance, namely, that while the present paper is intended as a plea for systematic biology, no complaint is made against the proportionate teaching of physiology, histology, and embryology, but only against the exclusive or disproportionate teaching of these branches, as if they comprised the whole of biology. And it may be added for the benefit of those who insist that the term biology should be restricted to the phenomena of life rather than the phenomena of living things, that, while unqualifiedly opposed to this narrow view, my present purpose is not to discuss the meaning of words, but to show the necessity of remodelling the current one-sided courses of instruction by the addition of systematic and formal zoology and botany, with a view to the development of a broad and comprehensive school of biology, worthy of the age in which we live.

In my judgment, university training in biology should comprise:

1. *Elementary instruction in general biology*, including cell structure and the structure of the less complex forms of animals and plants. This involves laboratory work with the microscope and implies the necessary knowledge of microscopic technic.

2. *Lectures on morphology, histology, and the relationships* of the major groups of animals and plants, both living and fossil, supplemented by laboratory work which should be restricted to the study of types and should keep pace with the lectures, if possible.

3. *Systematic work in widely separated groups.* This work must be done in the museum or laboratory, and may be supplemented by lectures. It should include the higher vertebrates as well as invertebrates and plants. In the case of advanced students, original work should be encouraged, particularly revisions of genera.

4. *Formal work*, consisting of the study of the life of limited areas. Care should be taken to avoid too comprehensive an individuality and the groups chosen for study should be selected, as a rule, with reference to the literature or specimens available for comparison. The necessary field-work, if unpracticable during the college year, may be done in vacation. Whenever possible, field excursions should be made at frequent intervals during the college year, under competent supervision.

5. *Lectures on the distribution of life.* In time, paleontological distribution, in space, geographical distribution. These lectures should be illustrated by maps, diagrams, and specimens. Access to zoological and botanical gardens and museums is of the utmost importance.

6. *Lectures on the principles and philosophy of biology*, comprising evolution, heredity, adaptations, special adaptations, and so on.

Botany and zoology should be taught separately under the second and third headings, and together under the first, fifth and sixth. Under the fourth heading they might be taught either separately or together, as most convenient.