

determination to win new marks of distinction in whatever line of activity you may engage. I hope you have enjoyed the work in which you have been employed, that you have worked industriously in working hours, that you have played intently in hours of recreation, and that you have enjoyed the companionship of your associates in hours of relaxation. If this has been your record, you richly deserve the honor which is extended to you to-day. But however great our satisfaction for the good work of the past, I congratulate you more heartily for the opportunities which are opening before you. You are soon to become active factors in a world sick of war, worn by strife and perplexed by intricate political and economic problems. There is a great need for men and women who have been trained to think, to weigh, to decide and to act. Become an investigator of conditions as you find them and do your best to improve wherever you can. I congratulate you most heartily for the opportunity for hard work, intelligent accomplishment and useful service.

"So long as men shall be on earth
There will be tasks for them to do,
Some way for them to show their worth;
Each day shall bring its problems new.

And men shall dream of mightier deeds
Than ever have been done before:
There always shall be human needs
For men to work and struggle for."

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THE NEED FOR TRAINING TAXONOMIC BOTANISTS¹

TAXONOMY is fundamental in its relation to other branches of botany in the sense that the correct identification of plants is the basis for all work which concerns the identity of species. Comparison of the results of investigations has value only in so far as there is certainty as to the plants compared. The cytologist compares the number of chromosomes in the allied species and their hybrids in a complex genus like *Rubus* or *Rosa*. The value of his conclusions depends on the accuracy with which his specimens have been identified. The pharmacist compares the oils derived from various species of oil grasses found in commerce. A taxonomist had to work over the group to which the oil grasses belong before the comparison was worthy of record. The proposition is so evident that further support would seem unnecessary.

¹Read at the meeting of the Botanical Society of America, systematic section, held at Nashville, December 28, 1927.

I have shown in another place² that taxonomy was a dominant branch of botany during the early development of that science; that during the last half century taxonomy has lost that dominance; and that now, especially in this country, that branch of botany occupies a distinctly inferior position as compared to other branches. This unfortunate condition hampers the symmetrical development of botanical science as a whole. Taxonomy has its place as a primary coordinate branch of botany and its growth should be encouraged that it may keep pace with such other primary branches as physiology, morphology and genetics.

Within recent years the demand for exact information on the identity of species has become more insistent. This is noticeable in connection with the exploration and development of tropical regions. Those interested in the vegetable products coming from these regions wish to know the specific identity of the plants producing these. When chaulmoogra oil came into prominence in connection with leprosy it was found that the identity of the species producing it was uncertain. At once a taxonomic study of the group concerned was necessary. Information in such cases can be furnished only by the taxonomist. However, the number of taxonomists with sufficient training and experience is at present so limited that information can not be furnished as rapidly as wanted. In other words, the demand at present is far greater than the supply.

In another direction the demand exceeds the supply. It is now difficult to find trained young men or women to fill positions in taxonomy. At the present time there are positions awaiting properly qualified applicants, and there appear to be no such persons available.

The chief source of supply of people for positions requiring previous experience in taxonomy is the larger herbaria of the country of which there are few. The source of supply for these herbaria is the college graduates who have taken an interest in taxonomy and have specialized in that subject. In the main we must depend upon our colleges to equip students with sufficient training to fill positions requiring a fair knowledge of the principles of taxonomy. In my opinion the colleges are not doing this to the extent necessary. In fact I believe the colleges in the aggregate are not giving the attention to taxonomy indicated by its proportional importance as a primary coordinate branch of botany.

This condition appears to be due to two reasons, the lack of trained taxonomists in our colleges and the lack of interest in the subject itself. In the latter part

²"The Scope and Relations of Taxonomic Botany," SCIENCE, n.s., 43, pp. 331-342, 1916.

of the last century there was a gradual swinging away from taxonomy toward more recently developed branches such as morphology, ecology, cytology and genetics. The swing has been so great that few taxonomists were trained at the period when our present generation of teachers were in college. There are, therefore, few taxonomists of first rank in our colleges at present. This condition also accounts in part for the lack of interest in taxonomy among our undergraduate and postgraduate students. Consequently, taxonomy if taught as a distinct course is likely to be in the hands of a teacher whose primary interests are in some other branch of botany.

Assuming a desire to give the teaching of taxonomy a coordinate rank in the curriculums of our colleges, how can this be realized under the present conditions? I venture the following suggestions on what should be attempted as rapidly as practicable. It should be understood that taxonomy is now taught satisfactorily in a few of our educational institutions and there are a few taxonomists of high rank in charge of courses in taxonomy, but in the aggregate taxonomy is not receiving the attention that it should.

First, the larger universities should establish a division of taxonomy as a primary branch of the department of botany. The professor in charge of this division should be a taxonomist of first rank.

Second, the student should be given the same opportunity to specialize in taxonomy that is given in other branches of botany. This opportunity should include contact with the subject at the same time that he comes in contact with the other branches. It should include a sympathetic attitude toward taxonomy, that is, the student should be encouraged to specialize in taxonomy if he shows a liking for the subject.

It has been objected that the demand for professional taxonomists is so small that it is not worth while attempting to train them on the same scale as botanists in other lines are trained. This objection disappears when the subject is examined more closely.

In the first place I think it is not the function of undergraduate instruction in botany to train professionals. Even the instruction in postgraduate courses is scarcely of the nature to train professionals. Professional training with the taxonomist begins when he accepts a position in which taxonomy is the chief line of work. Such would be an assistantship in an herbarium or in state or federal government department. What our colleges should do is to give the student a training which will fit him for a position of this kind. It is true that professional positions in taxonomy are limited in number. It is also true that professional positions in other branches of botany are few. How many positions are there in which the occupant devotes himself to physiology, to genetics or to cytology?

I am not here referring to teaching positions except as the teacher devotes himself entirely to one of these subjects. On the basis of specialization I think there is as much demand for taxonomists as for specialists in other lines.

Many of the botanists who take postgraduate work in our educational institutions become teachers of botany. If they are adapted to the prosecution of research they specialize in some branch in which they are interested. Much of the research in botany at present is carried on by teachers for whom the research is a side line. They are professional teachers rather than professional research workers. In this connection, then, my plea is that taxonomy be placed on an equality with other branches of botany in our colleges, then those who have taken special training in botany will have had an opportunity to equip themselves for research in taxonomy. Those who become teachers and have the opportunity and the inclination to carry on research in taxonomy can do this as a side line. In this way the amount of taxonomic research in America would be greatly increased.

It is true that comprehensive work in taxonomy can be pursued only in connection with a large herbarium and botanical library. But much can be done by the isolated worker if he confines himself to a definite group. He can accumulate specimens and books dealing with this group. He can supplement this by borrowing books and specimens. He can give the final touches to a piece of work by visiting a large taxonomic center.

Every institution teaching botany should have an herbarium, not a large one to compete with the great botanical centers, but a small well-selected collection of plants which can be used as a laboratory for teaching taxonomic botany.

However, the basis for the proper development of taxonomic botany is first a realization of its importance and, second, a sympathetic attitude toward this branch in our colleges.

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THE FIFTH NEW YORK MEETING OF THE AMERICAN ASSOCIATION AND ASSOCIATED SOCIETIES¹

PREPARATIONS for the fifth New York meeting of the American Association are much further advanced than is usual at this time. It is evident that this meeting will be larger and more important than any earlier

¹ This is the second announcement about the approaching New York meeting. The first announcement, by President Henry Fairfield Osborn, was published in *SCIENCE* for April 20.