at the beginning. If we are to feed and clothe the increasing population of the world and still retain some time for culture and recreation we shall need to conduct scientific research in all fields to an extent hitherto unheard of. This is especially true in the fields represented by this section. Unless we succeed in furnishing food and clothing nothing else avails. Except for temporary displacements, due to faulty distribution, population increase has been more rapid than food production. The time is at hand when we should have scientific information regarding disease control, genetics, maintenance of fertility and cultural methods which we do not now possess. It may take years of patient study to get it. We must educate the public to understand the need and provide for it. It is a part of the duty of this association to take part in this educational work. It is the special duty of this section in regard to agricultural science. Let us be a federation of inspiring spirits as well as active workers for its promotion.

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INVESTIGATION OF THE FLORA OF NORTHERN SOUTH AMERICA[1]

IN the summer of 1918, after consultation and correspondence by members of the staffs of the New York Botanical Garden, the United States National Museum and the Gray Herbarium of Harvard University, a cooperative investigation of the botany and plant products of northern South America was organized and has since been prosecuted. It is planned to include geographically the Guianas, Venezuela, Colombia, Ecuador, and the adjacent Caribbean islands Trinidad, Tobago, Margarita, Bonaire, Curaçao and Aruba.[2]

The reasons for the investigation are the deficiency of exact information relative to the vegetation of the region and the paucity of specimens of plants inhabiting it in museums and herbaria of the United States. By far the larger representation of the species is in European institutions. A great number of them have been collected only once, and records of habit and habitat are either altogether lacking or quite inadequate. Owing to the necessity of making comparisons of specimens with the types preserved in the European collections, much of the material which has hitherto found its way into American institutions has remained incompletely determined. While the published literature of the subject is large, it is widely scattered, and there are no complete lists of plants or descriptive floras of any part of the area under investigation; such monographs or lists of species of genera or of families as have been attempted by authors are incomplete and very many species have been erroneously identified. As to plant products, we are as yet uninformed in many cases as to the identity of the species of plants yielding them and whether or not the supply of such products can be increased by the cultivation of the species from which they are derived.

The investigation is making progress in remedying these conditions, through the study of series of specimens recently obtained in Dutch Guiana, British Guiana, Trinidad, Tobago, Venezuela, Curaçao, Colombia and Ecuador, collectively providing specimens representing several thousand species, and further field expeditions are being arranged. The collections when received, are divided among the three cooperating institutions, field agents being instructed to obtain three specimens of each plant collected whenever possible, and also to make record of habit, habitat and color of flowers and fruits and to make other notes which may be of importance. Specimens beyond three in number may be sent to other institutions or to specialists, and the cooperation of many experts has been obtained.

Preliminary studies of the collections already made prove that the investigation is very well worth while. Dr. Francis W. Pennell, of the New York Botanical Garden staff, expert in the Family Scrophulariaceæ, has detected and partly described some 70 species

[1] Read at the Princeton meeting of the National Academy of Sciences.

[2] See SCIENCE, 48: 156, 157, 1918.

new to Science from his own collections made in Colombia and in those made in Ecuador by Dr. J. N. Rose. These collections have yielded to Dr. B. L. Robinson, of the Gray Herbarium, expert in the genus *Eupatorium*, some 20 undescribed species, and to Dr. J. M. Greenman, of the Missouri Botanical Garden, expert in *Senecio*, about a dozen. Many grasses new to science were collected by Dr. A. S. Hitchcock, Agrostologist of the United States Department of Agriculture, in Venezuela, British Guiana, Trinidad and Tobago, and those obtained by other collectors have been classified by him. Much important information about the Cacti and some 10 new species were obtained by Dr. J. N. Rose, in Venezuela and in Ecuador. Dr. S. F. Blake, of the Bureau of Plant Industry, has done much work on the Carduaceæ.

Mr. W. R. Maxon, of the United States National Museum, is engaged in identifying the Ferns and Fern Allies, Mrs. Britton, at the New York Botanical Garden, is studying the Mosses, and Professor Alexander W. Evans, of Yale University, the Hepatics. Dr. W. A. Murrill and Dr. Fred. J. Seaver, of the New York Botanical Garden, and Dr. J. C. Arthur, at Purdue University, have partially identified the Fungi collected. Several other students are investigating smaller groups.

Much desultory work in identifying plants incidental in various families has been accomplished by Dr. J. N. Rose, by Dr. B. L. Robinson and by me. In order to make comparisons with types and authentically named specimens, I took this summer several hundred recently collected specimens of several families to the Royal Botanical Gardens at Kew, England, and compared them with the great collection preserved in the herbarium there; the wealth of undescribed species in the region under study is well illustrated by the fact that I was able to match only a small proportion of them.

In order to obtain a view of the vegetation and to increase the collections, I spent March and April in Trinidad, the part of the region perhaps the best known botanically, but even there I was able to add some fifty species to the known flora of that island, some of them new to science, through specimens collected by myself and members of my party and by studying the fine herbarium of the Botanical Garden at Port of Spain.

The field work has mostly to be done by collectors sent from the north, but we have highly valued cooperation from Mr. W. G. Freeman, Director of Agriculture of Trinidad and Tobago, and Mr. W. E. Broadway and others of his staff; Mr. Henri Pittier, Agricultural Expert of the Venezuelan government, is sending material from that republic; when Dr. Pennell was in Bogota, Colombia, he secured the cordial cooperation of the Christian brothers there, who are forming a Natural History Museum, and when Dr. Rose was in Ecuador he secured the interest of Mr. A. Pachano; we are also assured of cooperation through the governments of French Guiana, Dutch Guiana and British Guiana.

The investigation is also adding much to the knowledge of the natural geographic distribution of species, especially as regards those ranging into Panama and the West Indies.

It is becoming increasingly evident that we should obtain as much exact information as possible concerning the vegetation of tropical and subtropical America.

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PRACTICAL PSYCHOLOGY[1]

It is not easy to find an adjective describing adequately the applied psychology of tomorrow. "Solvent psychology," even apart from the alliteration, makes a certain appeal, for it designates a science capable of meeting all obligations; but the word has implications of deductive solutions reminiscent of metaphysics, Christian Science, psychical research, psycho-analysis, and other mysteries. William James, our distinguished master, has given

[1] An address before the Section of Psychology at the Chicago meeting of the American Association for the Advancement of Science, December 29, 1920.