

rector of the laboratories of pathological and surgical research in Marquette University, Wisconsin.

DR. HAROLD B. MYERS, Portland, formerly connected with the University and Bellevue Hospital Medical College of New York City, has become professor of materia medica and pharmacology, and Dr. Howard D. Haskins, Cleveland, formerly connected with Western Reserve University School of Medicine, professor of physiologic chemistry at the University of Oregon.

DR. H. ROY DEAN, professor of pathology in the University of Sheffield since 1912, has been appointed to the chair of pathology and pathological anatomy in the University of Manchester.

DISCUSSION AND CORRESPONDENCE

BOTANY IN AGRICULTURAL COLLEGES

IN SCIENCE for February 5, 1915, Professor C. V. Piper, of the United States Department of Agriculture, calls attention to botany in agricultural colleges. The article referred to directs attention to the previous article by Dr. E. B. Copeland on the same subject in SCIENCE for September 18, 1914. It would seem to be especially true that "this opens up discussion of a many-sided question of high pedagogical importance to agriculture." The articles, referred to above, have presented valuable views and the discussion ought to be continued, perhaps by those more able to do so than the writer. The present is desired to be taken as discussion rather than argument, and certainly not adverse argument.

Dr. Copeland apparently emphasized that "the raising of crops is essentially nothing more or less than applied botany." Professor Piper has forcefully presented the idea that "in striking contrast with chemists, botanists have shrunk from what may be a major application of their science, namely, that of crop production." It would seem that these writers might be on common ground in the belief that the problem of crop production must of necessity be solved with the attention of botanists.

It is possible that the writer may call attention to some difficulties of administration that

are bound to exist in agricultural colleges, so long as the boundary lines are not clear between botany and applied botany and possibly agricultural botany, on the one hand, and agronomy and horticulture on the other.

If it be true, as Dr. Copeland suggests, "the raising of crops is nothing more or less than applied botany," then there is small need for agronomy as a collegiate subject.

If it be true, as per Professor Piper, that the whole field of plant culture, or crop production, being one of plant ecology and plant physiology, must be so recognized by botanists, before progress in crop production will continue, then likewise the future of agronomy, at least the crop side of it, must necessarily trust to the mercy of the conservative botanist.

What is agronomy?

Agronomy is the sum of information or of research directly concerning soils and crops grouped essentially in relation to the business of farming.

Agronomy may be called a science where it is understood that a science is a group of related facts, or, again, it may be called an applied science where it is understood that it has use for many kinds of information which may be drawn from pure science. But any effort to define agronomy as a pure science or to accomplish the work of agronomy by conforming it to any given pure science must result in confusion or in begging the question of agronomy entirely.

It is a perfectly logical question to ask whether agricultural colleges need to recognize any such subject as agronomy. It is perfectly logical to inquire whether the purposes of such colleges may not be better accomplished without any departments of agronomy. It is conceivable that the work of agronomy in all agricultural colleges and experiment stations might be accomplished, or at least attempted, through the efforts of the several departments of pure science, which severally furnish sources of information from which agronomy must constantly draw.

The organization of agronomy as a group of facts in agricultural colleges is thus not absolutely necessary. It is no more absolutely necessary to organize departments of agronomy

omy to conduct instruction and research about soils and crops than it was originally necessary to organize agricultural colleges to educate farmers. The organization of agronomy is arbitrary, just as the entire matter of organizing agricultural colleges was arbitrary. The essential reason why agricultural colleges were organized was that the American people through their Congress conceived the idea that such colleges, if organized, would more definitely solve the problems of farm people and other industrial people than the old forms of colleges already organized. In short, colleges of agriculture and mechanic arts were to be and are logically organized, upon the basis of industrial needs, or else there was not and is not any call for any such separate organizations whatsoever.

It is matter of fact that colleges of agriculture and mechanic arts were and are organized, at least after a fashion, in the several states. Some of them appreciated fully that older institutions were concerning themselves with pure science and had been doing so for a long time and, further, they themselves were not brought into existence to be so many more of the same kind, but rather to make a very direct attack upon the problems of the farm and other industrial life. Those that saw that problem most clearly, it is safe to say, made the best progress.

In such institutions grew and are growing such forms of departments as agronomy, animal husbandry, horticulture, home economics, and dairy husbandry. The unit of every one is an industry, not a science. The organization of every one was necessary to solve the problems of an industry, not essentially the problems of pure science. The people and the departments, for example, who will solve the problems of soils and crops are agronomists and departments of agronomy. They will attack the problems from the standpoint of the business of farming and not from the standpoint of making application of some particular kind of science. It is true that they will need all the accurate information they can acquire from all fundamental sources. Their future departments will embody men whose equipment of knowledge consists in facts neces-

sary to the solving of their peculiar problems. Such equipment of knowledge as they will have, may not make them able to compete with specialists in any given pure science within the field of that science, nor will they expect to. They will have a business of their own. Agronomy can not and does not disregard pure science, but it has not and does not waste much time discussing whether pure scientists need more training. If they do, it is supposed that they will know that much for themselves, and in due time get it. The devotees of pure science will be busy enough withal, looking after their own proper fields of information and research, whether they be botany, chemistry or mathematics.

It is the function of pure science or of the several pure sciences to increase the sum of knowledge. Pure science departments in agricultural colleges are not properly different in that respect from pure science departments anywhere else. If they teach as they must, they should mainly supply that common basis for scientific thought which must needs be the common equipment of all who may engage in any kind of scientific work. If they engage in research, they should continue to develop and enlarge the world's knowledge, with primary regard for knowledge, not its application. In the agricultural colleges, the departments specially organized for the purpose will undertake to make application. Specifically the agronomists of the country are as well prepared to look after this their business of application, as botanists generally are prepared to supply new knowledge.

As Professor Piper has correctly intimated, the business of raising crops has made much progress upon the basis of knowledge secured by agronomists. Strangely enough, some of this knowledge has been "empirical." The process will continue. The way for botanists and botany departments in agricultural colleges to help will be to devote themselves to botany, not agronomy. Perhaps if they do that they will occupy the most enviable positions in the pure science of botany, and bring corresponding honor to their institutions. This will not be possible for them if they fuss around with the business of agronomy.

By such concentration of effort, and by such alone, can the departments of botany in agricultural colleges put themselves in position to answer the demands for botanical knowledge that will be made upon them. By such attention to plants, not as crops and as a part of an industry, but as part of a wide world's life, can they properly supplement the practical knowledge of departments of agronomy. By working separately and together, each in its well-defined sphere, can departments of botany and departments of agronomy in agricultural colleges contribute to the people and to the industry of agriculture, such science and such practise as will entitle their institutions to an honored place in future collegiate life.

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SOME NOTES ON ALBINISM

THIS journal has recently¹ briefly recorded some observation of albinos which recall some chance observations of the writer.

In the late "eighties" or early "nineties" when the English sparrow first became common and abundant near Franklin, Indiana, the writer, as a boy, was much impressed by seeing a white English sparrow. The albino, as well as two or more partial albinos, was repeatedly seen during the latter part of one summer in a large flock of the birds which lived about the barn on the home farm. During the same or a subsequent season there occurred one or more of the partial albinos in a large flock of the sparrows on an adjoining farm. Three or four years ago a female English sparrow pined on one wing and a portion of the back was frequently observed at Cold Spring Harbor.

Within two or three years of the time when the albino English sparrows were seen in Indiana a white fox squirrel was frequently seen in the same neighborhood. The writer saw it only once momentarily and at some distance, but other members of the family saw it and a brother examined it after it was shot by a neighbor. It was white except for the tail, which was characteristically gray. The

¹ O'Gara, January 1; Hargitt, February 12, 1915.

writer is under the impression that he was told that the eyes were "red," but can not vouch for that statement, although it is apparently a fairly safe inference that they were pink.

Near Oswego, Indiana (in 1903 or 1904), was seen an albino robin. It was not a clean white, but was tinged a slightly brownish or dirty hue. The bird was clearly seen at fairly close range and its identification could not have been mistaken.

In 1909 a family of gray squirrels, attracted by the abundant supplies of nuts, etc., proffered them, nested in a tree in the yard near a house in the edge of the town of Marietta, Ohio. One of the squirrels, the male, was a complete albino. Three of the young were albinos and one was a normally pigmented individual. The mother was accidentally killed and the young died. The following season an albino young one was captured and was kept in captivity until maturity. It was a pure albino with white hair and characteristic pink eyes. In all to the present time there are said to have been eleven albino squirrels known in that locality.

In 1907 while collecting the common aquatic isopod, *Asellus communis*, in a spring stream at Arlington, Mass., I found a number of pure albinos. The albinos were fairly abundant, there being perhaps one albino to eight or ten of the normally pigmented individuals. In January, 1910, and again in 1911 albino *Asellus* were found at the same spring.

In a small artificial pond in the Catskill Mountains last October the writer saw what he confidently believes to have been an albino newt, *Diemyctylus viridescens*. The animal was near the edge of the pool and escaped into deep water. It could not be located on subsequent visits to the pond, only a portion of whose margin was readily accessible for observation. The individual was pairing when seen and was apparently a female. There were many newts in the pond, on some of which the black pigment was not very conspicuous, but this one appeared so distinctly a clear uniform light orange yellow that its identification as an albino seemed fairly safe. It appeared very much to resemble in general body color an albinic or xanthic specimen of