nary biological worker they may perhaps suggest some modification of current methods. Unquestionably all constructive work in taxonomy, morphology, cytology, physiology or genetics is of value, and will be built into the general structure of knowledge. But if *Drosophila* or *Rosa* had only been studied to the same extent and in the same manner as it is possible to study the majority of insects or plants, the advances we now herald might have been delayed some hundreds of years. The field is too great to be adequately covered in any near future. I have spent a good part of my life describing about three thousand five hundred supposed new species of bees, but the combined work of all bee-students to date leaves the subject in much the condition of a page of a book, on which each line contained only one or two words and a few scattered letters. It would be impossible to do more than guess at the nature of the narrative. The thing to do is to admit that the book can never be completed in our generation, but by concentrating on certain pages we may make them intelligible. They should be selected from diverse parts of the book. That is to say, it would be more profitable to study intensively and cooperatively certain groups of animals and plants, such as *Rosa, Salix, Viola* and *Crataegus* among flowering plants, *Helix* and its allies among snails, *Drosophila* and its allies among flies, the Saturniidae among moths, and so forth. I mention some of the groups which are being intensively studied, but even in the *Drosophila* group much more might be done. The world is inhabited by great numbers of species of these flies, particularly, it seems, on remote islands. Ideally, there should be perhaps a hundred collectors and workers scattered over the earth. Even among the best-known groups there is still much to discover. The museums contain only a small part of the existing species, and adequate collecting must be done by experts, who also must make the field observations. We soon find that our program is too vast to realize, but there is nothing to prevent the cooperative concentration of existing workers on some of these subjects. This does not imply any denial of individual responsibility and credit. Each worker should contribute his separate part and if this has to be incorporated in another's report it should be fully credited, if only to enable the reader to learn the source of his information. The greatest obstacle perhaps would be to find adequate means of publication, but this ought to be overcome.

Even in the absence of organized cooperation it is possible for numerous workers to interest themselves in particular groups, in particular parts of the world. It would be possible for certain journals or societies to announce that they would give preference to papers on these groups, and for museums to make special efforts to accumulate and arrange materials pertaining to them. Thus there would be no sort of domination or coercion, but only a concentration of interest in given directions.

Along with the kind of specialization described should go another, at right angles to it. Particular localities should be intensively studied, to determine the biological interrelations of all the organisms present. The Clare Island survey and the investigation of Plummer's Island on the Potomac show how richly this kind of investigation may be rewarded. This class of work equally requires cooperation, but also permits and even necessitates individual responsibility for the several contributions.

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THE DE REVOLUTIONIBUS ORBIUM COELESTIUM

LAST summer, being desirous to check up some statements regarding the famous work of Copernicus, I found that if I wished to consult the work I must do so in the original. Fortunately, the New York Public Library possesses a copy of "De Revolutionibus Orbium Coelestium," and I procured the volume and closely examined it. It is not a large book, containing only some two hundred pages and sixty thousand words. The ink seems as black and the thick, heavy paper as good as the day in 1543 when it issued from the press. The text proper starts out with one of those abstract "demonstrations" which are passed aside as "scholastic" if found in a medieval book, but bowed down to reverently when found in some Platonic dialogue. But, after leaving this "proof" of the cosmic significance of the circle, Copernicus begins to review the known astronomical facts of his time and to draw one conclusion after another towards establishing the thesis that the sun is the central pivot around which the planets revolve.

This part of the text has extreme interest. The Latin is very easy to read and, as far as I could judge, seems to be almost wholly of the classic type. The book is broken up conveniently in many small subdivisions. There are about forty geometrical diagrams. The really striking point about this ancient book, however, is its air of extraordinary freshness, due partly to the fact that, Copernicus' mathematical apparatus being limited to Euclid and Ptolemy's presentation of trigonometry, he uses many ingenious proofs where a modern astronomer would, no doubt, use a more powerful method. But the main reason for the striking quality of the book seems due to another fact: Copernicus was studying the heavens with his naked eyes. Any one had only to look up in the

skies on a clear night and if in possession of a few measuring instruments (without lenses, of course) could at once check and follow his reasoning.

As it seemed odd to me that no translation of this work existed in English, I queried two publishing houses in the matter, one the house of Putnam, which has brought out the books in the Loeb library, the other, the Harvard University Press. Messrs. G. P. Putnam's Sons wrote, August 19, 1925, through Mr. Ben Ray Redman:

> I have read with great interest your letter regarding the possible translation of Copernicus' "De Revolutionibus Orbium Coelestium" and regret to inform you that the publication of this work could not be undertaken at the present time with any hope of commercial success—at least by a general publishing house. If this epoch-making book has never before been translated into English, it seems to me that one of the university presses would be glad to bring it out and to secure for it the distribution which it deserves.

Some correspondence passed between the Harvard University Press and the present writer. Their attitude was most courteous, but on October 30, Mr. Harold Murdoch, director of the Syndics, wrote that on October 22 that Board had "regretfully decided that it would be unwise for us to attempt the publication."

It may be of interest to state that when this book was placed on the Catholic Index as a prohibited book (in 1616) a list was drawn up of the changes which might be made in the book to render it safe for the faithful to read. It is a curious and unintended eulogy of the scientific character of the book that, with the exception of the passages where Copernicus sums up his conclusions, little beyond verbal changes were needed elsewhere to make the work read as a hypothesis rather than a thesis. It is now beginning to appear that the motive for this condemnation was largely to exhibit the Catholic Church as quite as orthodox about the biblical cosmogony as the sectaries. Actually, of course, the obvious earth and heavens of the Old Testament are of far cruder type than either the conceptions of Ptolemy or Copernicus, but this was a fact which neither Catholics nor Protestants could well concede; and Copernicus' book remained forbidden till 1835, when it was silently removed from the Index Librorum Prohibitorum.

DREW BOND

MT. VERNON, N. Y.

A PLANT NEW TO THE UNITED STATES

WHILE visiting a beekeeper at Mesilla Park, New Mexico, in January, 1925, I was impressed with his description of a plant on which his bees worked freely. Being unable to decide what it might be from his description and no plants being available at that time of year, he promised specimens the following summer. When they came, I did not recognize the plant and passed it on to Dr. William Trelease, of the University of Illinois, for identification. Trelease was just leaving for an extended absence and again passed it on to Dr. Paul Standley, of the National Museum, who has specialized in flora of the southwest.

To the surprise of everybody interested he identified it as Syrian bean-caper, *Zygophyllum fabago,* which had not previously been known to occur in this country. From local reports the plant has become naturalized over a considerable area of the neighborhood in which it is found and is the source of considerable honey in the particular apiary which first brought it to attention. No one has so far offered any explanation of its presence.

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MILLING AND BAKING QUALITIES OF OLD WHEAT

A FARMER living near Junction City, Kansas, presented in August, 1925, to the Kansas State Agricultural College a sample of wheat which he knew to be at least twenty-five years old. The wheat was dark red, the kernels were plump, well preserved and there was no evidence of weevil. The test weight as received was 55.8, and after passing the cleaning separator it was 56.3. A germination test made in the seed-testing laboratory showed no signs of life. A milling test gave a normal amount of flour, but the ash was high. The amount of moisture and protein in both the wheat and flour compared well with the average generally obtained from a normal Kansas hard wheat. The baking test produced a loaf of small volume, heavy texture and poor color. The bread was very similar to that made from wheat which has been injured by heating in the stack or bin or when germination has proceeded too far. The gluten washed from the flour was also similar to that obtained when wheat has been injured as mentioned.

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SCIENTIFIC BOOKS

Chemistry in Industry. In two volumes, edited by H. E. HOWE. *Chemistry in Agriculture.* In one volume, edited by JOSEPH S. CHAMBERLAIN and C. A. BROWNE. The Chemical Foundation Incorporated.

THE Chemical Foundation is an organization which has been described by A. Mitchell Palmer, former United States attorney general and alien property