ceive approximately $1,000,000 and the heirs of W. J. McDonald, Texas banker, the remainder of an estate valued at about $1,350,000.

THE dean of the medical school of the University of Oregon, Dr. Richard B. Dillehunt, announces that the Rockefeller Foundation has given $400,000 to the medical school, $300,000 of which will be used to construct a new clinic building on Marquam Hill, Portland, and the remainder for equipment.

AT Harvard University one or more scholarships in mining geology will be made possible by the gift of $10,000 made in memory of Carlton Thayer Brodrick, '08, by his father and mother, Mr. and Mrs. Alfred H. Brodrick, of Newton Highlands.

FOR the promotion of scientific research by graduates three fourths of the freshman class at Lehigh University have relinquished chemical laboratory refunds in favor of the student chemical foundation. These refunds consist of balances remaining at the end of the year from deposits made at the beginning of each semester to cover the cost of material used in the laboratory. The total amount to be turned over, it is estimated, will be $5,000 this year. Of this sum, $1,500 will be used for two graduates in chemical engineering to carry on research next year and the balance will be used to build up a permanent fund of $50,000.

DR. SAMUEL T. ARNOLD, associate professor of chemistry at Brown University, has been appointed acting dean during the absence of Dean Otis E. Randall, who has leave of absence.

PROFESSOR E. A. MILNE, of the University of Oxford, will give a course of lectures on "The Physics of the Stars" during the summer session of the University of Michigan.

PROFESSOR A. H. COMPTON, of the University of Chicago, has been appointed a member of the 1929 summer session staff in physics at Cornell University. He will give courses dealing with "X-Rays and Electrons."

DR. THEOPHILUS S. PAINTER, of the University of Texas, has been appointed professor of biology for the summer session of 1929 at Western Reserve University. Dr. Painter will give two series of lectures on different aspects of cytology.

ACCORDING to *Popular Astronomy*, Dr. Knut Emil Lundmark, of the Observatory of Upsala, has been appointed professor of astronomy in the university and director of the observatory at Lund as the successor to Professor C. V. L. Charlier, who recently retired. Professor H. Vogt, of the Königstuhl Observatory, Heidelberg, has been called as director of the observatory and as professor of astronomy at the University of Jena.

DISCUSSION

WHAT IS THE TYPE OF A GENUS?

THE necessity for a concrete type specimen, which fixes the identity of a species with objective definiteness and can be referred to as absolutely authoritative in spite of eventual errors in description, is now almost universally recognized. The usefulness of the type specimen has become so clear that we may expect presently to regard it as indispensable, and provide accepted substitutes in cases where there were no original types or where these have been lost.

The need for the same objective typification in the case of genera is equally manifest, but the codification of rules is more needed in this case, and the best method of satisfying the need of types is not clear. I have been trying for a long time to locate objective types of the acceptable genera of *Polypodiaceae,* and have encountered difficulties in principle as well as in detail. What is agreed upon is that a genus must have a type species. In the easy, simple instances, this is sufficient; the genus has a type specimen in that of its type species. This is true even without any agreement that a genus needs a type specimen.

But a couple of examples will show the need of rules or laws, and of a court to interpret and apply them. Take the genus *Ptilopteris,* of Hance.[1] It was duly defined and explained in Hance's elegant Latin, concluding: "Duae tantum hucusque mihi certe innotuerunt species: has inquam:

1. Pt. Hancockii, sp. nov. [which is then diagnosed, and]
2. Pt. Maximowiczii (= Polypodium Baker!)."

The second of these represents a genus, not previously recognized, so distinct that its affinity is not yet agreed upon, and in complete agreement with Hance's generic diagnosis. The first is a *Polystichum,* absolutely at home in that genus, and not even in full conformity with Hance's diagnosis of *Ptilopteris.* The rule that the type species of the genus shall be the first species listed under it (in the absence of another specified type), would reduce *Ptilopteris* to synonymy with *Polystichum* and leave *Pt. Maximowiczii* without a tenable generic name. The Kew suggestion, that "standard species" be adopted, will meet the difficulty in this case. *Pt. Maximowiczii* can be the standard species and its type specimen *may* be that of the genus. It is clear, from the fact that it agrees with his diagnosis while his first species does not, that this fern was the real subject of his generic diagnosis. But then, is the type specimen of *Ptilopteris* the one Hance used as the basis of his generic

[1] *Journal of Botany,* 22: 188, 1884.

description, or is it, as just suggested, the type specimen of the species *Polypodium Maximowiczii* Baker? The question itself shows the need of generic type specimens. My judgment is that in this case it should be Hance's specimen. He described a recognizable and distinct genus, and it would serve no purpose to render this genus nameless by showing that he was in error in the identification of the plant he based it on. He seems to have been correct; but there are very many known instances in which men have been wrong in such cases. The difficulty in the way of a rule sanctioning the recognition of Hance's specimen as the generic type is that such a rule would leave it impossible to locate any type for a great many genera.

Campium, Presl, Tentamen Pteridographiae (1836) 238, is a similar but more complicated case. The first species listed is "Campium punctulatum (Acrostichum punctulatum Presl nec Lin.)." I have reason to believe that this does not belong in the genus Presl described (it was based on a sterile specimen), and that *C. preslianum* (Fée), which Presl later accepted as a substitute name, is a different fern. Here, again, a standard species will standardize the genus. It will be *C. costatum* (Wallich) Presl, the second of the species listed and the only other one discussed or figured. In this instance the type almost must be Presl's specimen, in spite of his citation of Wallich, because the names in Wallich's List are now regarded as *nomina nuda.* There are still other possibilities: Christensen's view is that *Campium costatum* was left a *nomen nudum* by Presl.

One more example: *Hemigramma.*[2] This genus was published as comprising a single species, *Hemionitis Zollingeri* Kurz. By general present consent, this is a synonym of *Gymnopteris latifolia,* named by Meyen and described by Goldman, the proper name being *Hemigramma latifolia.* If the generic type is fixed by Christ's citation, the type of the genus is not the type of any valid species. If the generic type is that of the species Christ really founded his genus on, *H. latifolia,* it is a specimen Christ not only never saw, but which he explicitly regarded as a different fern. The actual, material foundation of Christ's diagnosis was a collection of specimens of which the first cited was *Borden no. 2124.* Taking this case by itself, the most reasonable view would be that the type specimen of the genus is Christ's specimen of Borden's collection. The objection to a rule to this effect has already been indicated.

I am very sure that we must come to the recognition of type specimens of genera. The question of what these types shall be, or at least the general principles underlying their fixing, will have to be decided by a congress, and the subject is brought up now to stimulate discussion, so that action by a congress may not be ill considered. What is the type of *Hemigramma?*

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[2] Christ, *Phil. Journ. Sci.,* 2c: 170, 1907.

BIOLOGICAL CONTROL OF THE PRICKLY PEAR

THE brief account of the prickly pear work in Australia, given in SCIENCE of January 18, suggests the desirability of some additional comments. Last year I had the pleasure of visiting the experiment station at Sherwood, near Brisbane, and was able to see what was going on and have it all explained to me by Mr. Alan P. Dodd. I was especially struck by the thoroughness of the work, the careful survey of the enemies of *Opuntia* in various countries, and the extreme care taken to avoid introducing undesirable insects. Some insects which might be serviceable against prickly pear will occasionally attack other plants, and if experiments show that any such danger exists, they are not used. On the other hand, the safe and valuable species are pushed with vigor. The moth *Cactoblastis cactorum* has been known since 1885, when Berg described it from Argentina as *Zophodia cactorum.* The French entomologist Ragonot, in the Romanoff Memoires, 1901, established for it the genus *Cactoblastis.* It was introduced into Australia in June, 1925, and has already done marvelous work in the destruction of the prickly pear. About sixty million eggs have recently been distributed, and from now on it is expected to distribute at least one hundred million a year, as long as may appear necessary. The one fear is that some native or introduced insect may take to preying on *Cactoblastis* in such numbers as to nullify its work, but so far nothing of the kind has happened. The genus *Cactoblastis* has one other species, described by Dyar, which occurs at Mendoza, Argentina, and has not been imported. Last year Dyar named a third (*D. leithella*) from Curaçao in the Dutch West Indies, the distinction resting wholly on the habits and appearance of the larva, as described by the collector, Mr. Leith F. Hitchcock.

The intensive study of *Opuntia* insects has brought out a number of facts of great biological interest, and suggests the desirability of promoting other studies of the same type, whether of immediate economic significance or not. Thus the whole subject of the cochineal insects (*Dactylopius*) has taken on a new aspect. Having paid much attention to these insects in former years, I can testify that morphologically the several forms are very much alike, so that the number of species has been in doubt. But Dodd and