ACCORDING to foreign journals a Berlin inventor, Mr. Hugo Gantke, has recently designed a simple device for the felling of trees. The trunks are cut by the friction of a steel wire about one millimeter in diameter, which, as demonstrated by practical tests, is able to cut through a tree of about 20 inches (50 cm.) in thickness in six minutes. The wire, which is carried to and fro by an electric motor, is heated by friction on the tree to such an extent as to burn through the timber, the result being a cut which is both smoother and cleaner than that effected by a saw. The wire will work satisfactorily on the thickest trees without the insertion of wedges into the cut, and trees may be cut immediately above or below the ground. In the latter case the stump may be left safely in the soil. The motor which actuates the wire is installed outside of the range affected by the fall of the tree, and when electricity is not already available it can be generated by a transportable power plant, consisting of a 10-horse power petrol motor and dynamo, which are left at the entrance to the forest during the felling operations. By this method large tropical trees up to 10 feet in diameter can be cut and felled by a single operator, a considerable advantage being the absence of any waste in the timber.

UNIVERSITY AND EDUCATIONAL NEWS

GROUND has been broken for the library building at the University of Chicago, which is to serve as a memorial to the late President William Rainey Harper.

GROUND has been broken for the addition to Morse Hall, the chemical laboratory of Cornell University, the cost of which was provided for by Mr. Andrew Carnegie's recent gift of $50,000.

THE cornerstone has been laid of the new building at Columbia University, in which the departments of the faculty of philosophy are to have their rooms.

LIVERPOOL UNIVERSITY benefits under the will of Mr. T. S. Timmis to the extent of £10,000 to endow a cancer research laboratory.

WE learn from the New York *Medical Record* that at the University of Pennsylvania with the opening of the coming fall session an elective course in tropical medicine will be offered under the immediate charge of Dr. Allen J. Smith, in conjunction with Dr. A. C. Abbott, Dr. G. E. de Schweinitz, Dr. William Pepper, Dr. W. H. Hartzell and Dr. H. H. Jacobs. The course will comprise instruction in medical climatology and geography, the hygiene of ships and of the tropics, protozoology, anthropology, helminthology, general medical pathology, diseases of the eye and of the skin, surgical diseases common to the tropics, pathology of tropical diseases, and systematic and clinical tropical medicine.

DR. JOHN HENRY MACCRACKEN has been designated as acting chancellor of New York University, the appointment to take effect on the resignation of his father, Dr. Henry M. MacCracken next month.

DR. L. C. KARPINSKI has been promoted to an assistant professorship of mathematics at the University of Michigan. He will give a course in the history of mathematics.

DR. FRANCIS M. SLACK, director of the bacteriological laboratory of the Boston Health Department, has accepted an instructorship in bacteriology in the Kansas State College.

CHARLES S. WILSON has been promoted to a professorship of pomology at Cornell University.

DR. GOTTLIEB HABERLANDT, professor of botany at Gratz, has been called to Berlin.

DR. A. GILBERT, professor of therapeutics at the Paris College of Medicine, has been appointed professor of clinical medicine to succeed Dr. Dieulafov.

DISCUSSION AND CORRESPONDENCE

SCHMIEDEKNECHT ON THE PARASITIC HYMENOPTERA OF THE FAMILY CHALCIDIDÆ

IN the ninety-seventh fascicle of Wytsman's "Genera Insectorum"[1] Dr. Otto Schmiedeknecht gives a treatment of the hymenopterous

[1] "Genera Insectorum," dirigés par P. Wytsman, Bruxelles, 97me fascicule, Hymenoptera, family Chalcididæ, by Professor Dr. Otto Schmiedeknecht, 550 pages, 8 plates, 1909. (Price, 136 francs, or $27.20.)

family Chalcididæ (= superfamily Chalcidoidea Ashmead) which is of such magnitude and seeming importance that it warrants more or less extended notice in these pages. The volume is twice the size of Ashmead's monumental work on this complex group[2] and its general appearance would indicate that an epoch-making treatment of the superfamily was before us. However, disappointment is sure to follow upon examination of the volume, for its general incompetence and defectiveness are soon revealed, and in fact have already been pointed out by one reviewer. The work certainly is but a huge compilation based mainly on the work of Ashmead, but this is not the reason it loses value as a fitting work of reference to the group. An accurate compilation of the tabular arrangements of the various groups of this complex would be of the greatest importance in serving to advance our knowledge of it, but this would needs be critical and tend to weed out the obvious errors existing in former works. This volume before us, however, is lacking not only in independence of spirit, but also in that nice discrimination which is so much to be desired in works of this kind and it is non-critical and loosely put together. It is hardly exaggerating to say that it is as full of errors nearly as the sum of errors existing in the whole literature of the group, and is especially at fault in the treatment of some of the less known groups where judgment and discrimination are most needed and thus far conspicuous for their absence. As it is highly desirable that the status of this work of Dr. Schmiedeknecht's be made known so that it will not mislead, I select the family Trichogrammidæ for more extended notice, as it is a small group of about fourteen genera badly in need of revision and on that account an excellent specimen of the general defectiveness of the whole work; for if the latter possessed value it should certainly tend to bring order out of the crudeness and confusion at present existing in this family. But see what we have here.

A first glance at the treatment of this family (or subfamily as Schmiedeknecht prefers to style it) shows to a specialist that nearly all essentials of it are paraphrased from the work of Ashmead previously alluded to. A single example is all that is necessary to show this. Thus, immediately preceding the table of the genera of the subfamily Trichogramminæ Ashmead states:

> Subfamily II. Trichogramminæ
>
> This subfamily is easily recognized by peculiarities of the front wings, the pubescence, being arranged in distinct rows or lines, a peculiarity found in no other group, except to a slight extent in some genera in the subfamily Entedoninæ, of the family Eulophinæ.

In the corresponding place Schmiedeknecht gives this:

> 2. Tribus Trichogrammini
>
> Trichogramminæ, Subfamily 2. Ashmead, *Mem. Carnegie Mus.*, Vol. I., p. 360, 1904.
>
> Allgemeine Charaktere.—Die hierher gehörenden Arten sind ausgezeichnet durch die regelmässigen Haarreichen der Flügel. Im beschränkten Masstabe kommt diese Erscheinung nur noch bei einzelnen Entedoninen vor.

These two paragraphs are essentially the same in meaning. And this is so throughout, only Schmiedeknecht adds after the table of genera of each of the two tribes or subfamilies a brief treatment of each of the genera including synonymy, description and catalogue of the species, while Ashmead confined himself entirely to a tabulation of the genera. It is in blindly copying these latter and slavishly following Ashmead in regard to generic diagnoses that our author is most seriously culpable. At the very outset he falls too readily into the probable error of accepting the genus *Oligosita* Haliday as the type of the first division of the group which is perhaps *Brachista* Haliday. In this first division of the group we find exactly the same tabulation of the five genera as given by Ashmead with all of his errors, partly excusable here with him because of the date of the appearance of his work, but

[2] "Classification of the Chalcid Flies or the Superfamily Chalcidoidea, with *etc.*," *Memoirs Carnegie Museum*, Pittsburgh, I. (Publications of the Carnegie Museum, serial No. 21), pp. v–ix, 225–551, pls. XXXI.–XXXIX., 1904.

certainly inexcusable in this later and larger work. In regard to *Asynacta* Foerster and *Brachista* Haliday no attention has been paid to Mayr's descriptions of their type species in 1904, which gave both genera valid standing (formerly without species) and changed our conception of them. This table then is mere copy work. In the brief treatments of the genera following it, the description of *Asynacta* by Arnold Foerster is merely repeated but under *Brachista* Haliday two of Ashmead's species are listed without naming either of them as type; I now know that neither of these species belongs to this genus and that *Eulophus exiguus* Nees is its type as Mayr has designated. *Prestwichia* Lubbock is treated slightly more at length and figured (plate 8, figs. 9 and 10), but the figure of the male is apparently wrongly copied from Willem (1896) and the male antennæ do not show a ring-joint or are but six-jointed.

But in the second division of the group things are much worse. In the table of the genera Ashmead is again followed except in a few minor instances, and an exact copy of his table would have saved commitment of at least one grave error. Thus *Trichogramma* Westwood is made to have an exserted ovipositor in this exceptional attempt at nice discrimination. Otherwise, though the genera are placed in different sequence by shifting sentences, the rest of the tabulation is practically in the same words as given by Ashmead and all of the errors of the latter are repeated. We look in vain for *Ophioneurus* Ratzeburg, for *Calleptiles* Haliday and for *Pterygogramma* Perkins; we are wearied again with the same old mistaken diagnoses of *Poropœa* Foerster and *Trichogramma* Westwood; with the needless enlargement of the characterization of *Chætostricha* Walker (*sic*); with the persistence of *Aprobosca* Westwood, and with the confusion of *Xanthoatomus* Ashmead, a genus without status and a synonym of *Trichogramma* Westwood if such a thing is possible. Hence of the nine genera given in this table four are erroneously diagnosed, two are synonymous with two of the others and one should hardly be accepted—a large percentage of error for such a small number of genera involved; and at least two others were omitted.

But even this is not all. It remains for the brief treatments of the genera included in the table to bring out still others. In spite of definite and positive statements to the contrary witness *Poropœa* being reared from the larva of a beetle; *Ophioneurus* a synonym of that genus and of *Trichogramma; Calleptiles* a synonym of the latter; see *Trichogramma flavum* Ashmead, *T. fraternum* Fitch and *T. orgyiæ* Fitch parading as members of this family; *Ophioneurus signatus* Ratzeburg included within *Trichogramma.* And wonder is indeed excited when we accidentally find the figure of *Trichogramma evanescens* Westwood (by the way perhaps the only valid species of the genus as far as I am able to learn) on plate 8, figure 3, which is obviously concocted from the imagination and is the more striking because it does not even agree with the characters of the genus given in the table of the genera. *Pentarthron minutum* (Riley) is listed three or four times under as many different names and of that genus a number of species are omitted, the most conspicuous of which is (*Oophthora*) *Pentarthron semblidis* Aurivillius. *Lathromeris* lacks its only well-described species, *cicadæ* Howard, and *Centrobia* also lacks one of its two species. But why go farther. We can sum up the treatment of this family very well in percentages of error. Of the fourteen genera described up to the time of the appearance of the work and which are now valid, 21.5 per cent. are omitted entirely, 14.2 per cent. are given as synonyms of other genera and of the genera actually given, a total of 14, 21.5 per cent., are synonyms, the same percentage are referred back to the wrong authorities, 43 per cent. are wrongly diagnosed or described and there is at least 75 per cent. of error in the figures of the two genera illustrated. Of the 44 species described up to the publication of this work as members of the family, Schmiedeknecht omits 30 per cent.; of the 32 species which were then valid, he omits 42 per cent.; 11 per cent. of the 27 species given validity

by him are synonyms and 44 per cent. are wrongly placed as regards genera. Finally, in the whole treatment of the family, covering but seven and a half pages, I am able to count offhand as many as 49 misleading errors, and to offset these not a single feature which in any sense can be called progressive. Hence the obvious conclusion is that we find ourselves no farther advanced, as far as this family is concerned, than formerly. And as a corollary that which is not progressive and helpful in regard to taxonomy is worthless.

It is not fair, however, to condemn the whole work on such restrictive criticism without examining other parts of it, but space of course will not allow more than a few general remarks. Suffice it to say that in all of the other groups we find the same state of affairs as in the Trichogrammidæ and especially a lack of up-to-dateness in regard to new genera and species. Thus even as a bare list of described genera and species the volume would be seriously incomplete and as a contribution to the taxonomy of the superfamily absurd and ludicrous. As a catalogue it would take lower rank than that of de Dalla Torre (1898), which is notorious for its looseness, errors and lack of critical ability, but which, notwithstanding these, possesses much worth as a bibliography of the genera and species. But Schmiedeknecht lacks even in this respect—mainly because of incompleteness.

Of the 83 figures given but 18 of them are colored, in spite of the statement in regard to the 8 colored plates. Many of these figures are copied directly from Ashmead, Howard and Masi, and I find serious differences between these and the originals, but will not particularize here. They may finally take rank with the famous concoctions of Snellen van Vollenhoven; at any rate, it should be pointed out that they are none too trustworthy and by reason of that both obstructive and misleading. Moreover, many are given as original drawings without reference to sources, if such exist, and at least some of these are grotesque and bizarre in the extreme—to wit, the one of *Trichogramma*.

It is a serious thing to have to condemn in its entirety the result of such a prodigious amount of labor, yet it is no more than just and right that others should be warned to keep out of the path of this taxonomic derelict that they, ourselves and the whole future be not imperilled. Truly this volume is both a tragedy and a comedy of errors.

A. Arsène Girault

Urbana, Ill.,
August 2, 1910

The Population of the United States

To the Editor of Science: In the *Popular Science Monthly* for last April, and also in its issue for November, 1900, a formula was given for calculating the population of the United States corresponding to any time between 1790 and 1900.

As the results of each formula agree only approximately with those of the census, I thought it might be of some interest to present a formula that should agree exactly. Such a formula is the following:

$$P = A + at + bt^2 + ct^3 + dt^4 + et^5 + ft^6,$$

in which P denotes the population, in millions, t the time expressed in decades and estimated from 1790; while

$$A = +3.9,\ a = +0.523333,\ b = +1.603889,$$
$$c = -1.020833,\ d = +0.343056,$$
$$e = -0.0525,\ f = +0.00305555.$$

The formula holds good from 1790 to 1850, but from 1850 to 1910 the coefficients have the following values:

$$A = +23.2,\ a = +18.303333,\ b = -19.481111,$$
$$c = +12.470833,\ d = -3.544444,$$
$$e = +0.475834,\ f = -0.0244444,$$

and the origin of t is at 1850.

Any series of observations which depend on a single variable may be represented by a formula of this kind, and a table has been prepared by means of which the values of the coefficients, *a, b, c,* etc., can be easily and expeditiously calculated. By the aid of this table a formula could be developed which would give the exact results of the census from 1790 to 1910, and without any change in the values of the coefficients.