Bohn would do away with the word instinct; and finalism is for him an explanation that comes into play only after a first appeal to other more mechanical inherent causes. "For Jennings," he says, "selection would be effected among the various movements of trial, and the final result would be a tropism. For us, the tropism, as Loeb has said, is something inherent, and it would be one of the elements on which selection would be exercised." Thus for Bohn the psychic evolution of animals would result, in some sort, from the struggle which occurs among the old survivals of the past (as tropisms and the phenomena of differential sensibility), and the new acquisitions (fruit of associative memory). This is made only painfully, and to a certain degree, by "*coups de revolutions.*"

Finally Bohn believes that we are sufficiently advanced in our study of animal behavior to be able to enunciate certain laws, not only for the tropisms and differential sensibility—"a conception which for the first time appears in a book of animal behavior"—but also for the associative phenomena. He holds that animal psychology is now no more open to the criticism that its "explanations," such as tropisms, differential sensibility, associations of sensations, etc., are simply labels and terminology and do not really explain the animal mechanism in its behavior, than the other sciences whose more familiar terminology, as "gravitation," "atoms," etc., seem, but in reality only *seem,* to be so truly explanations.

When Newton discovered the laws of universal gravitation, he had to confess that he had no idea as to the *cause* of this phenomenon. Is his merit less great for that? Have not his ideas, although incomplete, permitted us to build a great scientific structure that compels all our admiration, although we may be to-day quite as little advanced as to the subject of the nature of gravitation as was Newton in 1687 or Epicurus three hundred years before Christ? Now in the domain of zoological psychology, the scholars of the new school inaugurated by Jacques Loeb seek to imitate Newton in the domain of astronomy; they analyze the phenomena and establish their laws. . . . As said recently by my regretted master Giard: "The analysis which is necessary to let us master the phenomena of life furnishes us a surer base than that which tends directly to explain these phenomena."

Vernon L. Kellogg

Paris,
April

NOTES ON ENTOMOLOGY

The report[1] of M. Roubaud, who spent a year and a half in the Congo region as a member of a commission to study sleeping sickness, is before us. It goes, in much detail, into the habits and habitats of *Glossina palpalis,* the particular species of tsetse flies which is concerned in the spread of this dread disease. Agreeable to the general rule he finds that the flies are very local, rarely going more than 300 yards, but may be carried by air currents and storms to greater distances. They bite only during the daytime, and feed on a great variety of animals. There is a long account of the larva, and of its curious posterior lobes, which apparently represent the posterior spiracles. The fly deposits the full-grown larva on the ground, which crawls into the soil and there pupates. The author details a number of experiments on the effects of different temperatures on the pupæ. Species of *Bembex,* a spider (*Dolomedes*), a beetle (*Cicindela*) and ants are among the natural enemies of the *Glossina.*

A large part of the work is taken up with a study of the Trypanosomes, and five of the plates illustrate them. A long bibliography is appended to the article.

The new parts of Wytsman's "Genera Insectorum" are as follows: Fasicle 76 is by J. J. Kieffer on the small Hymenoptera of the family Bethylidæ; 30 pp., 3 pls. He considers that they are most closely related to the Scoliidæ. Fasc. 77, by the same author, treats of the small family Stephanidæ; 10 pp., 1 pl. He adopts the classification of Ender-

[1] "La Glossina palpalis; sa biologie, son rôle dans l'étiologie des Trypanosomiases," Rapport Mission d'études de la Maladie du sommeil au Congo Français (1906–1908), pp. 383–652, 8 pls., 4to, 1909, Paris, by E. Roubaud.

lein. Fascicle 78 catalogues the beetles of the Group Languriinæ; W. W. Fowler is author; 45 pp., 3 colored plates. There is very little original matter. Fasc. 79, reviewing the Ortalid flies of the subfamily Pyrgotinæ, is by F. Hendel; 33 pp., 1 colored plate. This author, as usual, gives a very satisfactory account. Fasc. 80 is on the Scelionidæ, a family of minute Hymenoptera, by C. T. Brues; 59 pp., 2 pls. Many of the species are from the United States. An appendix includes the European species recently described by Kieffer. Fasc. 81 is by Dr. K. W. von Dalla Torre on the Anoplura, or lice; 22 pp., 1 plate; a brief treatment following the arrangement of Enderlein. Fasc. 82[a] is an elaborate treatise on the popular group of beetles—the Cicindelidæ, by W. Horn; 104 pp., 4 plates and a map of geographical distribution. Fasc. 83, Carabidæ, subfamily Omophroninæ, by E. Rousseau, 5 pp., 1 plate; fascicles 84, 85, 86 are by the same author on small groups of the Carabidæ. Fasc. 87 is on the "white flies—Aleyrodidæ," by A. L. Quaintance, 11 pp., 2 pls. Fasc. 88, on the beetles of the subfamily Erotylinæ, by Paul Kunht; 139 pp., 4 colored plates, appears to be very well prepared. Fasc. 89, 91, 92 are by A. Bovie on groups of weevils; Læmosaccinæ, 6 pp., 1 pl.; Belinæ, 13 pp., 1 pl.; Gymnetrinæ, 22 pp., 2 pls., 1 of which illustrates the life history. Fasc. 90, concerning grasshoppers of the subfamily Pyrgomorphinæ, is by I. Bolivar; 58 pp., 1 plate. It is a good treatment of a group well known to the author.

THE fourth volume of the Cambridge Natural History has at last been issued. It contains the accounts of the Crustacea and the Arachnida. The Arachnida is mostly by Mr. Cecil Warburton. The treatment is not very detailed, and in some parts, as the pseudoscorpions, much out of date. The chapter on mites is entirely too short, some large families, as the Hydrachnidæ, being disposed of in four or five lines. In general it is fairly accurate, but so much interesting matter has been omitted that the reader will gain only a slight idea of the enchanting world of arachnids.

THE new entomological parts of "Die Süsswasserfauna Deutschland's" include Hefte 3 and 4 on the Coleoptera, by E. Reitter, Heft 7 on the Collembola, Neuroptera Hymenoptera and Rhynchota, by R. and H. Heymons and Th. Kuhlgatz, and Heft 12 on the Araneæ, Acarina and Tardigrada, by F. Dahl, F. Koenike and A. Brauer.

The coleopterous part deals mostly with the Dytiscidæ, Hydrophilidæ and part of the Staphylinidæ. The part on Collembola is mostly on the genus *Smynthurus;* that on Neuroptera treats the genera *Sialis, Osmylus* and *Sisyra.* The Hymenoptera include species in the Ichneumonidæ, Braconidæ and Chalcidæ. The Rhynchota by Kuhlgatz is rather more complete than the other parts, with full descriptions of each species. The part on *Corixa* will be of value to the American hemipterist. Heft 12 on the Arachnida is almost wholly occupied by the water-mites, Hydrachnidæ, and is very fully illustrated.

ANOTHER part of the Catalogue of the Diptera of the world by Dr. C. Kertész is now before us.[2] This part contains the Bombylidæ, Therevidæ and Scenopinidæ. For this latter family Dr. Kertész has adopted the name Omphralidæ. The Bombylidæ include 1,696 species in 84 genera, the Therevidæ include 270 species in 16 genera, and the Scenopinidæ have but 28 species in 4 genera. *Conophorus* is used for *Ploas,* and *Argyramœba* for *Spogostylum* of the Aldrich catalogue. Especially commendable is the brief and logical form of his references.

A MONOGRAPH of *Myrmecophila,* a curious genus of crickets, is the theme of Fritz Schimmer.[3] A considerable part is devoted to the ethology and distribution of the genus, and especially to its relations with certain ants. The morphology and anatomy occupies the bulk of the paper, while in the systematic part are the descriptions of the eleven species, five of which occur in the United States.

[2] "Catalogus Dipterorum hucusque descriptorum," Vol. V., Budapest, 1909, 200 pp.

[3] "Beitrag zu einer Monographie der Gyrllodengattung Myrmecophila Latr.," *Zeitschr. wissenschf. Zool.,* Vol. 93, pp. 409–534, 3 pls., many text figs., 1909.

H. Schouteden has published another fascicle of his work on the Hemiptera of the Congo.[4] A list is given of all the species now known from that region, nearly 300 in all. The plates illustrate the new species.

Nathan Banks

SPECIAL ARTICLES

THE POSSIBLE EFFECT OF CEMENT DUST ON PLANTS

A short time ago my attention was called to an extraordinarily abundant deposit of light gray dust on all sorts of exposed surfaces out of doors in one of the valleys not far from San Francisco. This dust was declared to come from the manufactory of Portland cement owned and operated by the Cowell Lime & Cement Co., near Concord, California. Unfortunately the manufacturing plant was shut down during the time in which both of my visits fell, so I did not myself see that the dust came from those works and only from there. I have, however, no reason to doubt its source, the attorney, manager and other officials of the Cowell Company admitting that they lose much cement as dust.

The light gray dust forms, where reasonably undisturbed, a film of increasing thickness over everything out of doors. This film adheres to some surfaces much more closely than to others, according to the smoothness, hairiness, stickiness, moistness of the surface. It could not be entirely blown off any surface which I saw, but the rain which fell in the interval between my two visits washed it off some surfaces, but not by any means all. Where the dust fell on undisturbed soil it could be readily recognized because of its color and shade: it is a light gray, whereas the soil is brown. Although the roads are lighter in color than the fields, since they are partly macadamized with a light gray stone, they too are darker than the dust. The origin of the dust is, therefore, clearly not entirely from the roads or fields.

In composition the dust presents some interesting characters under the microscope. It is evidently composed of fine particles of at least three different sorts. One of these is translucent crystalline fragments, fairly numerous. Another sort, less numerous, consists of somewhat larger opaque and fairly rounded particles. By far the largest number, however, are minute granular particles which cohere in irregular masses, often of considerable size. The masses of coherent granular particles enclose and in a way bind together the particles of other sorts. The granular material readily dissolves, with effervescence, in hydrochloric acid, even dilute, but the other particles remain on the slide, under the microscope, undissolved. Acetic acid similarly affects the dust when applied to small quantities on the slide under the microscope. From this it is evident that the dust consists largely of some readily decomposed carbonate.

This dust more or less completely covers the foliage of the native and cultivated plants in a considerable area, extending, as I observed, to a distance of over six miles from the cement works. It is carried on the winds and, as is so common in this part of California, the winds prevail in very definite directions according to the season of the year. In consequence, the dust goes in one direction mainly during the summer, and leaves the remainder of the valley free. It is more abundant on the windward than the leeward side of scattered trees, of orchards, etc. It covers the upper surface of many leaves, such as oak, willow, grape, prune, plum, quince; but such glossy leaves as peach, lemon, orange do not hold it against a breeze. It adheres also to the under side of many leaves, especially if the under side is less smooth than the upper. On fruits it is also evident, especially on dark or dark-skinned sorts, and it can not be removed from them without also rubbing off the bloom; it will not simply drop off if they are dipped or washed in water.

The market value of property has naturally been influenced by this excess of dust; the salability of land within the affected district being greatly decreased, and the market for otherwise fine table grapes covered by a deposit of grit is altogether a limited one.

On the other hand, it may be questioned

[4] *Ann. Musee du Congo Belge, Zool.*, Ser. III., Sec. II., Tome I., fasc. 1, pp. 88, 2 col. plates, 1909.