sides. We may then say that the dorsal side of the spermatozoon is always directed toward the surface of the drop and that its body is bent or curved toward the left. The second possibility is that the condition here is the same as that described in certain insects by Ballowitz,* who considers the circular motion as a modification of the normal spiral motion which these spermatozoa have when in the middle of the fluid. Being at the surface, further progress in that direction is impossible.

Besides the above-mentioned article by Ballowitz, Dewitz † has described circular motion in the spermatozoa of *Periplaneta orientalis* and other insects, and Dungern ‡ and Buller § have found this phenomenon in all classes of the Echinodermata. Buller's paper, dealing with this subject in some detail and including a study of closely allied species, makes any further account of my observations an unnecessary repetition. It is to be hoped, however, that more careful studies on the structure of the Echinoderm spermatozoon will throw some light on the cause of this interesting phenomenon if, as seems probable, it be structural.

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Lasell Seminary, Auburndale, Mass.,
December 23, 1902.

NOTES ON ENTOMOLOGY.

The question of the interpretation of the mouth parts of Diptera has long been a bone of contention among entomologists. Mr. Walter Wesche in a recent article|| has furnished some additional light on the subject. The author found, by examining the cibarian structure of various flies, that in a few forms there are distinct, though small, projections arising from the proboscis near the base of the hypopharynx. He considers them as 'rudiments' (vestiges) of palpi. They are quite prominent in species of *Hyetodesia, Spilogaster* and *Hydrotea;* and more or less distinct in many Anthomyidæ, Sarcophagidæ, Borboridæ and Sepsidæ, and even in the common house-fly. The position of these palpi indicates, according to the author, that they are maxillary. Therefore, the large palpi of Diptera are labial, and the proboscis is not formed by the union of the labial palpi. The author appears to be ignorant of Dr. Smith's work on the same subject, in which he records two pairs of palpi in the Tabanidæ. Both authors, however, agree that the proboscis is not part of the labium.

The third volume of Mr. Tutt's 'British Lepidoptera' has been issued.* It is a volume of nearly 600 pages, much of it in fine print. Like the other volumes, its most remarkable feature is the labyrinthine wealth of technical detail. All that has ever been published on British Lepidoptera has been carefully studied, and everything that could be of the slightest interest is reproduced here. This third volume treats of but thirteen species, several species occupying over twenty-five pages, and one, *Lasiocampa quercus,* more than sixty pages. Although the work deals with British insects, the amount of matter on biological subjects is so great that the book can but be of immense interest to all concerned in the study of Lepidoptera.

Professor R. Blanchard has given an interesting review† of the poisonous punctures of certain Hemiptera. He records the finding of an Anthocorid, *Lycotocoris campestris,* in a bed in Liverpool, and a large Reduviid, *Rhodnius prolixus,* that at times attacks man in the United States of Colombia. The latter is known locally as the 'Bichuque.' He summarizes what has been written on the 'kissing bugs' of the United States, and adds some European cases of the punctures of *Reduvius personatus.*

Articles on mosquitoes are now quite the

* *Zeitschr. f. wissen. Zool.*, Bd. L., 1890, p. 393.

† *Arch. f. die gesammte Physiologie*, Bd. XXXVIII., 1886, p. 358.

‡ *Centralbl. fur Physiologie*, Bd. XV., April, 1901, Heft 1.

§ *Quart. Jour. Mic. Sci.*, Vol. 46, Pt. I.

|| 'Undescribed Palpi on the Proboscis of some Dipterous Flies, with Remarks on the Mouth Parts of Several Families,' *Trans. Roy. Micr. Soc.*, August, 1902, pp. 412–416, 2 pls.

* 'A Natural History of the British Lepidoptera,' Vol. III., London, July, 1902.

† 'Sur la piqûre de quelques Hémiptères,' *Archives de Parasitologie*, V. (1902), pp. 139–148.

thing. Among many recent ones may be mentioned one by Henri Polaillon.* There are chapters on morphology, anatomy, biology, classification and descriptions of French species, malaria, filariasis, yellow fever and prophylaxis. The author has done a considerable amount of work, especially on internal anatomy, but (as a rule) it simply confirms previous statements.

The specialist who cannot resurrect some long-forgotten name from the mouldy tomes of science to replace a well-known and established name is indeed behind the times. The craze to place our nomenclature on a stable basis is resulting in discoveries comparable only to those made in recent archeology. With the coming of each new periodical from Europe we wonder what old friend is now lost in the bog of synonymy. Walsingham in Microlepidoptera, Kirkaldy in Hemiptera, Oudemans in Acarina, Cambridge in Araneida, and Cockerell in the Coccidæ have been tossing genera hither and thither in a most dazzling fashion. Now Krauss investigates the Orthoptera,† finding (as La Porte and Westwood knew) that even the name of the order falls, a synonym of the older Dermaptera. Among other changes, the old family Acridiidæ becomes Locustidæ; *Locusta* Linn. replacing *Acridium* Latr.; while *Acrida* Linn. dethrones *Truxalis* Fabr., and *Acrydium* Fabr. supplants *Tetrix* Latr. The old family Locustidæ becomes Tettigoniidæ; and *Acheta*, replacing *Gryllus*, turns the family Gryllidæ into Achetidæ. The great pity with all of this reforming is that so much of it is correct.

In Part II. of a new publication‡ Dr. Franz Stuhlmann has an article on the tsetse fly (*Glossina morsitans*) and its connection with the 'Surrah' disease of Africa. This disease, which is fatal to many domestic animals, is known in South Africa to be transmitted by the tsetse fly. The life-history of the parasite is not yet known, but it is supposed to pass certain stages within the fly. The tsetse fly, as Stuhlmann states, is closely related to the common stable fly (*Stomoxys calcitrans*), and he gives the life history of the latter insect as probably being similar to that of the tsetse fly. The author compares the various species of *Glossina*, and records finding *G. tabaniformis* in East Africa. He suggests the various lines of investigation that should be followed to discover means of fighting the disease.

The government of India has published a paper on forest insects by Professor E. P. Stebbing, Forest Entomologist of India.* It is illustrated by six plates drawn by a native artist. Fifty-two species are treated; a description, life history, nature of damage, and suggestions for control. Most of the injurious species are Lepidoptera, and among them we note *Agrotis ypsilon* and a number of forms closely allied to the gypsy moth. Three species of Coccidæ of the genus *Monophlebus* are new.

The second part of Kertész's catalogue of the Diptera of the world has been issued. It treats of the families Cecidomyiidæ, Limnobiidæ, Tipulidæ and Cylindrotomidæ. There is also a list of the Cecidomyiidæ according to the plants that serve the larvæ as food. He uses *Cecidomyia* for the species previously called *Diplosis*.

Yellow Entomology.—The popularization of science has gone a long way, but Mr. Harvey Sutherland in the 'Book of Bugs'† has carried it beyond all previous records. The book treats of the insects most common about the house and yard. It is replete with many interesting actual facts, and contains few serious misstatements (such as *Vedalia* eating San José scale). But all these facts are so thickly sugar-coated with humor and nonsense that it will be difficult for the lay

* 'Contribution a l'histoire naturelle et médicale des Moustiques,' Paris, 1901, pp. 128, 22 figs.

† 'Die Namen der ältesten Dermapteren (Orthopteren) Gattungen und ihre Verwendung für Familien- und Unterfamilien-Benennungen auf Grund der jetzigen Nomenclaturregeln,' *Zool. Anzeiger*, 1902, pp. 530–543.

‡ Bericht über Land- und Forstwirtschaft in Deutsch-Ostafrika,' Bd. I., heft 2 (1902).

* 'Departmental Notes on Insects that affect Forestry,' No. 1, pp. 149, Calcutta, 1902.

† 'The Book of Bugs,' New York and London, 1902, pp. 223, 41 figs.

mind to distinguish fact from fancy. Since much of it evidently is not so, the tendency of the average reader will be either to disbelieve everything that seems improbable, or else with child-like faith to swallow both Jonah and the whale. That the facts of nature should be presented in a pleasant and attractive form will be admitted by all, but for this purpose it is not necessary to adopt the style of the comic weekly. It tends to discredit the facts. The author has been very careful in his selection of matter, but his treatment will not, we think, develop a popular interest in insects.

Nathan Banks.

BOTANICAL NOTES.

PHARMACOGNOSY.

In this department of botany, which is scarcely entered by professional botanists in America, there should be found opportunity, as in Europe, for that critical study of cells and tissues which so delights a certain class of students. We have sometimes felt that professors in German universities were to be envied because of the easy way they have of putting a dull student at work on some root or bark, expecting no more from him than a year or two of patient sectioning, drawing and describing. The work is original, and yet there is no danger that the inexperienced and really incompetent student will attempt to make any generalizations, nor that he will ask his instructor to help him make certain 'conclusions.' We are reminded of all this by a volume entitled 'A Course in Botany and Pharmacognosy; by Professor Kraemer, of the Philadelphia College of Pharmacy, which has just appeared. The book was written 'to meet the individual needs of the author in his work as a teacher of botany and pharmacognosy,' and as such is worthy of serious attention. Any book which is the outcome of a successful teacher's experience is a contribution to the pedagogics of the subject with which it deals, and on that account, if on no other, should be of interest to every teacher or student of that subject. Professor Kraemer's book apparently embodies his solution of a problem in pedagogics, and apparently the problem is how to give the student of drugs enough knowledge of botany to enable him to study dried roots, stems, leaves, etc., with sufficient intelligence to make it worth his while to do the work. We confess to not liking this way of preparing a student for his work by a 'short cut' in botany, but no doubt the author dislikes it too. He faces a 'condition, not a theory' which is quite too common in schools of pharmacy and medicine, in which inadequately prepared men must be given technical instruction when they should be at work on the underlying and antecedent subjects. What can one do with a student in pharmacognosy who has not had a good training in plant histology, and systematic botany? He must give such 'short-cut' training as the time will permit, and then push his half-prepared men into their technical work; and who can affirm that this is not the best solution, under the circumstances?

The book before us devotes one hundred pages to a rapid and rather superficial examination of the cell, the vegetative, and the reproductive parts of the plant, and this is followed by over two hundred pages relating to crude and powdered drugs, a few pages in regard to reagents, and finally the descriptions of the seventeen plates at the end of the volume. Throughout the first part the whole intent appears to be to prepare the student in the shortest possible time to know the application of every term which he is likely to meet in his subsequent work, and to know how to treat the different specimens he has to take up. The student is not made a botanist, by any means; he is put in possession of a lot of empirical information so that he may be able to make some sort of study of drugs. And no doubt as long as the colleges of medicine and pharmacy admit such illy prepared men, this is a wise course to pursue, and this book thus becomes a useful text for such students. The lesson to be derived from it is that botanists should insist that if pharmacognosy be taught at all, the students should have better antecedent preparation, by having taken courses in plant histology and systematic botany. 'Were this accomplished, pharmacognosy would become a part of scientific bot-