of petroleum, it would be of great interest to know more about the "localized reservoirs of great volume" for which the organic origin of oil "is not entirely satisfactory." Certainly, more detailed explanations must be made of the analysis if it is to be of the greatest possible usefulness.

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## AN OBSERVATION AT THE TIME OF THE AURORA

BETWEEN 8:45 and 9:00 P. M. to-night (October 14th) we observed a peculiar phenomenon which seems to have some connection with the Aurora Borealis.

The auroral streamers were very strong, and we went into a north room to view them. There was no house illumination: all electric lights were turned off, so as to see the streamers better. Outside there was a moonlight of medium clarity. No perceptible wind was blowing; the air was unusually clear, and the point of observation was exceptionally free from obstructions and street or house lights, being on the top of a treeless hill 725 feet above sea level, in northern New Jersey. The outdoor illuminations against which the phenomenon was observed were a few street lights *about half a mile away.*

While watching the Aurora, my son happened to hold his face close to one of the window panes, so that some of the warm moisture of his breath was precipitated on the glass. Then began the curious thing. The entire area of mist of the glass seemed to begin drifting and blowing at a great rate. It looked for all the world like a tremendous snowstorm. Heavy flakes and wisps of driven snow appeared to be flying past us outside of the pane. It is important to record that *the movement was entirely toward the north and horizontal.* There was *no upward movement,* as one might expect if this had been merely the evaporation of the condensed moisture on the pane.

This movement was visible on no clear pane. As the moisture passed, the movement vanished; as we breathed afresh on the pane, the illusion—if it was one—came back full force.

We waited until the Aurora had ceased, which was about 9:15 P. M. Then, only the faintest trace of the streamers being anywhere visible, we again breathed on the pane; but now no such phenomenon developed.

Will some expert on auroras or radioactivity or relativity or something else kindly enlighten us? Or have we stumbled on some new oddity in this mysterious realm?

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## SCIENTIFIC BOOKS

*Heteroptera or True Bugs of Eastern North America.* By W. S. BLATCHLEY. The Nature Publishing Co., Indianapolis, Ind. 1,116 pages, 12 plates, 215 text figures, Oct., 1926.

THIS is the fourth of Blatchley's books on the systematics of the insect fauna of Eastern North America and upholds the high standard set in the "Coleoptera of Indiana."

The general account of the group, including directions for collecting, is followed by a systematic arrangement tabulating the families, genera and species. The descriptions of the 1,253 species are mostly new, but in the Miridae and Corixidae, owing to the difficulties in obtaining identified material, it was necessary to compile descriptions of some species. A few species are described as new, chiefly from Florida, and a number of tropical species are recorded from Florida for the first time. The nomenclature and classification are those generally accepted, but in a few cases there are changes. With many species the host-plant is given and something of the habits.

The descriptions appear full and sufficient and the synopses, though partly compiled, are well made, altogether easily the best book on the Hemiptera of our country, and it will long be the one most necessary to the student, be he a beginner or a specialist. As with the others of this author's works it will undoubtedly stimulate the study of our insects. One can not refrain from expressing the greatest admiration for the ability and energy which, overcoming numerous obstacles, has pushed this work to such a successful conclusion.

N. BANKS

## SCIENTIFIC APPARATUS AND LABORATORY METHODS

### THE EXTRACTION OF FAT FROM SPECIMENS PRIOR TO CLEARING BY THE POTASH METHOD

IN specimens cleared by the potash method the fat of the superficial and muscular fasciae is partially saponified and appears in the cleared material as opaque, white masses which often prove a serious impediment to accurate observation of the skeletal elements as noted by Strong (1925).[1] After the treatment with potash it is apparently difficult to get rid of the fat, as Strong was unable to find a suitable solvent for these masses and found it necessary to dissect them away.

This difficulty may be obviated by the extraction of

[1] Strong, R. M., 1925, "The Order, Time and Rate of Ossification of the Albino Rat (Mus Norvegicus Albinus) Skeleton," *Amer. Jour. Anat.*, Vol. 36, 313–55.

the fat prior to beginning the treatment with KOH. Of the several common fat solvents tried, acetone was found most satisfactory. It acts quickly and does not injure the tissue or affect its clearing and staining qualities.

The material is first thoroughly fixed in 95 per cent. alcohol and then transferred directly to acetone, being left there for several days, depending on the bulk of the object being treated. Following this treatment, the specimen is transferred directly back to 95 per cent. alcohol for twenty-four hours or longer. After washing in alcohol, the clearing and staining with alizarin may be carried out routinely. In our work we are using a modification of the alizarin method, which results in a progressively selective staining of the bone (Dawson, 1926).[2]

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## MACERATION OF GREEN HYDRA

IN working with *Hydra viridis* I hit upon a method of maceration that gave results which were better than those obtained by other recorded methods.

For the benefit of those who may be interested, the method is given below.

This involved a fixing fluid composed of equal parts of 40 per cent. formalin, 95 per cent. alcohol and glacial acetic acid. This fluid has been devised and used by Mr. J. B. Looper in the fixation of certain protozoa here in this laboratory. This mixture is placed in a vial that has a mouth of from one half to three fourths inches in diameter. Place the Hydra on a microscopic slide in a very small drop of water. Then draw off as much of the water as possible with a fine pipette, leaving only a film of water surrounding the specimen. Invert the slide over the vial containing the above macerating mixture, in such a manner as to completely cover the mouth of the vial, for eight to ten minutes. At the end of about ten minutes—some specimens requiring a shorter time than others—remove the slide from the vial and add one or two drops of water and draw off. Add water the second time and draw off. Then add a drop of 40 per cent. glycerine. Tease or break up the Hydra with fine needles. Apply the coverglass and examine. If the cells are not separated sufficiently, gently press the coverglass with a needle; however, care should be taken not to crush the delicate cells. At this point, if pressed too hard, the cells are easily smashed and the preparation ruined.

[2] Dawson, A. B., 1926, "A Note on the Staining of the Skeleton of Cleared Specimens with Alizarin Red (sodium alizarin monosulphonate)." *Stain Technology* (to appear in the October number).

Excellent preparations have been made from freshly collected specimens and specimens which have remained living in the laboratory aquaria for as long as two or three months. Many of these preparations show fine cell structure.

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# SPECIAL ARTICLES

## GROWTH AND TRANSFORMATION OF PARASITIC GLOCHIDIA IN PHYSIOLOGICAL NUTRIENT SOLUTIONS

IN experiments completed at the U. S. Bureau of Fisheries Biological Station at Fairport, Iowa, by us this summer, artificial nutrient solutions were prepared in which the glochidia of the freshwater mussel, *Lampsilis fallaciosa* Smith (known as the Creeper or Slough Sand-shell), were carried through their various developmental stages from glochidium to the free-living juvenile mussel. The glochidia of this species of freshwater mussel are parasitic on the gills of the short-nosed gar, *Lepisosteus platostomus* Rafinesque, for a period varying from two to several weeks, during which time the glochidia undergo marked internal changes and differentiations and emerge from their cysts at the end of this sojourn on the fish as free-living juvenile mussels. The nutrient fluid was perfected so that this period of parasitic life on the fish could be replaced by a period *in vitro,* during which the growth and differentiations ordinarily made by the glochidium in the cyst could be studied and controlled.

The glochidia used in these first series of experiments were dissected out of their cysts on the gills of artificially infected gar, eighteen and ninety-six hours after encystment was begun. The freed glochidia were transferred at once to the solutions in which their development was to be followed. Glochidia removed from the cyst eighteen hours after attachment to the fish gill differed little if at all in appearance from ripe glochidia in the maternal marsupium. Glochidia removed at the end of ninety-six hours showed considerable development of the organ anlagen, although the glochidia were still in a very embryonic stage, as was evidenced by the presence of a large portion of the larval mantle cell mass. In the most favorable solution tested the glochidia were carried through the twelfth day in the solution, at which time their development equalled that of control glochidia which had been carried on the fish and were just ready to emerge from their cysts. When this stage was reached by the glochidia *in vitro* they were transferred from the nutrient solution to river water in