respect their history in the *Drosophila* embryo, up to a late period of development, is completely in accordance with the classical view maintained by Van Beneden, Boveri, Flemming, Heidenhain, Meves and other early leaders of cytology.

We are convinced that the phenomena in *Drosophila* are in no way exceptional in amphiastral mitosis save in respect to the clearness and profusion of the evidence; and we are confident that intensive and impartial study, using an adequate technique, will demonstrate essentially similar conditions in amphiastral mitoses generally.

The foregoing observations will later be set forth in full, with suitable figures, by the junior author.

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A NEW POSTERIOR PITUITARY PREPARATION

DURING July and August, 1930, the following method was developed and tested. The resulting material proved to be so different in chemical and pharmacological properties, that a preliminary report was given at the chemistry section of the Cleveland A. A. A. S. meeting.

Fresh beef posterior pituitary lobes are finely ground with a small quantity of sand and transferred to a flask containing about ten volumes of neutral high grade acetone. It is placed in the ice-box and occasionally shaken. New fresh portions of glands are added as obtained from slaughter house, keeping the same acetone ratio. When enough has been obtained to make a convenient batch (100 grams) the material is filtered and fresh acetone is added, shaken frequently and kept at ice-box temperature. Again it is filtered, washed with acetone and once more suspended in 10 volumes of acetone, shaken and cooled as before. The residue from this last acetone treatment is nearly white and dry. Three treatments (each at least 24 hours) with the best grade ether are now used, the procedure being the same as for acetone. Then three additional treatments with high grade petroleum ether. After the last petroleum ether extraction the material is spread out and the occluded solvent evaporated, then returned to the original flask and extracted with ten volumes of a mixture containing methyl alcohol, 70 per cent.; water, 25 per cent.; acetic acid, 5 per cent. This treatment is much like the preceding ones. The above process is repeated two times more. These three acid alcohol extracts contain the active material. They are evaporated in shallow dishes at low temperature with the aid of a fan. The residue is dissolved in a small volume of acid alcohol and precipitated with acetone and ether. The solution and precipitation is repeated. It is further purified by solution in water containing enough pyridin to dissolve the material and then precipitated with acetone and ether. The yield is very satisfactory.

The use of acetic acid in the above extracting medium is the least objectionable, though the other acids in low concentration are also very effective. In place of methyl alcohol, ethyl or propyl can be used. Sixty per cent. acetone and acetic acid is also a very satisfactory solvent.

The final product is not very soluble in distilled water, though moderately soluble in boiled distilled water. It has a rather sharp iso-electric point at about pH 5. It easily dissolves in dilute acids or dilute alkalies. It is precipitated by copper and zinc salts, by many of the acid protein precipitants and by salting out with ammonium chloride and other salts. The biuret is pale violet. Trypsin, as well as strong acids, destroy the activity and hydrolyze the substance. It is unstable in weak alkali. It seems to be a polypeptide. It contains labile sulfur. It gives strong reaction on blood vessels and isolated uterus, but has no effect on frogs' melanofores.

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THE OCCURRENCE OF FILTERABLE FORMS OF BACTERIA IN NATURE

FOR a number of years many bacteriologists have refused to follow the conventional view that the bacteria are limited in their morphology to the typical cells with which we are familiar in the laboratory. Increasing evidence of pleomorphism and life cycles, which may include ultramicroscopic and filterable forms, has accumulated. Throughout the world the number of workers capitulating to the more "radical" school of bacteriologists has increased during recent years. In America, among others, have been such outstanding investigators as Drs. Mellon, Löhnis, Henrici, Rosenow, Hadley and Alice Evans, who have vigorously supported the newer view in one or more of its several aspects.

To Hadley and his coworkers belongs the honor of having proved beyond reasonable doubt the existence of filterable forms of several of the well-known bacteria. A careful reading of the work of Hadley, Delves and Klimek[1] should be sufficient to convince fair-minded skeptics.

While knowledge of "filterable viruses" as the causes of certain diseases is old, our knowledge of such organisms has been limited to a few obligate parasites. That there exist free-living saprophytes of such a nature has been denied. Thus Barthel and Bengtsson,[2] in a work addressed specifically to this problem, found no evidence of filterable microorganisms in soil. From the work of Hadley and his asso-

[1] *J. Infect. Diseases*, 48, 1–153, 1931.
[2] Meddelande No. 341, Centralanstalten försöks. jordbruk., Bakteriologiska avdelningen No. 47 (1928).

ciates it would seem not only logical but inevitable that bacteria in all stages of their developmental cycles should be found in nature. It is of value to demonstrate this fact because of its many important implications, biological and practical. It is important, also, in order to remove the many significant observations of Hadley and previous investigators from the shallow objection of being artificially induced laboratory "involutions."

Following the methods of Hadley, and also with slight variations therefrom, we have demonstrated the presence of filterable microorganisms in soils, decomposing manure, hay infusions, fresh human feces and milk. We have followed the transformation of some of the "g" types (Hadley) to the point where they would be recognized as "bacteria" in the usual sense. It should hardly be necessary to state that all filtrates have been controlled and tested for "sterility" by the conventional methods. Berkefeld v and n filters have been used with the same positive results. Growths obtained from the filtrates have been refiltered and the "g" types again developed.

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POSITIVE GAS AND WATER PRESSURE IN OAKS

EVIDENCE of positive gas and water pressure in forest trees was observed by the writers during the late summer and early fall of 1930, in western North Carolina and northern Georgia hardwood forests.

In connection with a growth study carried on by the Appalachian Forest Experiment Station, numerous forest trees were drilled with the increment borer. This tool consists of a hollow steel bit, turned like an auger into the bole of a tree (usually at breast height). The hollow bit will then extract a solid core of wood somewhat smaller in diameter than a pencil, extending from bark to pith. A sudden reverse twist of the handle frees the core from solid wood at the inner end of the bit. Annual rings on the core can be counted for determining age or measuring growth along that particular radius.

It was the writers' observation that frequently after the bit had been inserted two inches or more, scarlet oaks (*Quercus coccinea*) would emit enough liquid to cause a dripping from the outer end of the borer. Often there was an accompanying hissing sound as though gas were escaping, though not with any great pressure.

One 14-inch apparently sound scarlet oak was encountered which had sap pressure enough to eject the 3-inch core with considerable force and follow it with a stream of liquid which was thrown 3 to 4 feet from the base of the tree. This liquid had the characteristic ill-smelling odor of scarlet oak sap. The occurrence seems more remarkable considering the very dry season preceding it. At that time, late summer, the rainfall deficiency for the calendar year was 12.73 inches related to a normal of 40.28 inches.

The only two species in which inflammable gas was found were the chestnut oak (*Quercus montana*) and the white oak (*Quercus alba*). In some of these trees, which ranged from 8 to 16 inches, diameter breast high, the positive gas pressure was sufficient to blow the core out of the hollow bit with considerable force. The gas was frequently lighted and would shoot a blue flame, sometimes 1½ to 2½ feet long, extending horizontally near the source but gradually curving upward to its tip. The flame would burn steadily for thirty seconds or so, then gradually lose force and become smaller. It was usually snuffed out soon after lighting to preserve the temper of the borer. In all trees issuing inflammable gas the heartwood was unsound, apparently affected by a dry rot. Curiously enough failing pressure could occasionally be revived by turning the borer into the tree a little farther; sometimes the issuance of gas was stopped completely by turning it too far. Because of the fact that the flame was blue it suggested a gas similar to, if not, methane, which is known to be a product in the decomposition of cellulose.

The writers have not observed positive gas or sap pressure in any other species or at any other season of the year than indicated above. Wood,[1] however, observed inflammable gas in white oak and red oak (*Quercus borealis*) in West Virginia during the fall of 1927. Such phenomena as have been observed may be of interest to investigators of the water and gas systems of trees.

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ANALYSES OF THE BLOOD OF IDIOTS

IN the issue of SCIENCE for March 20, page 316, there appears a note headed "Biochemistry in Relation to Intelligence." In this note the writer, H. D. Powers, claims to have found an abnormal amount of inorganic phosphate in the blood plasma of idiots. In results which we have obtained from analyses of blood samples taken from idiots of classified mentality we have been unable to obtain such results. Inorganic phosphorus in blood plasma samples from twenty-five idiots has been found to be within the normal limits. Our results range from 3.1 mgs to 5.0 mgs per 100 cc of blood, with an average of 4.0

[1] L. M. Wood, "Gas from Trees," Service Bulletin, U. S. Forest Service, Washington, D. C. December 1, 1930.