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THE NATION AND PETROLEUM GEOLOGY TO-DAY[1]

By HUGH D. MISER

U. S. GEOLOGICAL SURVEY

OUR nation is entrusted with a rich heritage of abundant petroleum. The annual output of this essential mineral fuel may be expressed in barrels and dollars, but to offer a fitting measure of its importance would require an appraisal of the service of petroleum in terms of human welfare and progress.

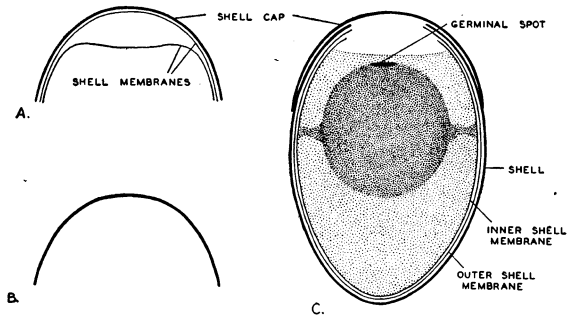
Chief among the many uses of petroleum is the generation of power. Such power drives 30 million motor vehicles on the nation's highways, 1½ million tractors on American farms, our merchant vessels and Navy on the ocean and our planes in the air. Altogether one third the mechanical energy produced in the United States comes from petroleum. Also, crude petroleum provides the plentiful supply of lubricants that has made possible our machine age.

The modern petroleum industry dates from the drilling of the Drake well in Pennsylvania in 1859 and, although the industry now encircles the earth, our country leads in the development of the industry and it produces and consumes three fifths of the world's oil. Also, our known oil reserves are equal to those of the rest of the world.

PRODUCTION OF PETROLEUM

The value of our petroleum output for 1938 expressed in dollars is one third the value of the entire annual mineral production of the United States. The next mineral product in point of value is coal, the next is natural gas, and then follows iron. Further

[1] Address of the vice-president and chairman of the section on Geology and Geography, American Association for the Advancement of Science, Columbus, Ohio, December 27, 1939. Published by permission of the director of the Geological Survey, United States Department of the Interior.



FIGS. A, B and C

the limits of the air cell in that region. After cleaning the eggshell with cotton moistened with alcohol, the outline of the air cell is marked with pencil. With tweezers a small opening is made above the air cell, and by careful chipping, pieces of shell and membrane are removed to make a circular opening somewhat smaller in diameter than the air cell beneath. With sterile tweezers the inner shell membrane is next removed to the same extent, leaving the albumen exposed. (See Fig. C.) The previously prepared shell cap is now placed over the opening and the egg is ready for incubation. The shell cap is not sealed in any way.

After several days of incubation the level of albumen within has dropped and permits the further removal of shell. Care must be taken to avoid injuring the allantois. With a relatively large opening, later stages of development are clearly visible over the entire upper surface.

In the incubator such eggs must be held vertically. Holes may be made in strips of coarse screening to hold the eggs in a standard incubator tray. If the egg is permitted to roll over on its side, albumen will be lost. Held vertically, apparently no turning of the egg is necessary. Difficulty of hatching may be avoided by sprinkling the 18-day egg with water.

The incidence of infection of embryos has been extremely low, considering the fact that the shell cap is simply laid over the eggshell opening and may be removed daily for observation of the embryo. The overlapping margin of the eggshell and its cap is apparently an effective barrier to bacteria. The porous shell of the cap apparently permits adequate gaseous exchange between the living embryo and the exterior, yet prevents excessive desiccation.

The simplicity of technique involved and the low mortality of embryos recommend this method for use in classroom demonstrations and as a source of normal living embryos readily accessible to the research worker.

JOHN W. PRICE
ERNEST V. FOWLER

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A SUPPLEMENTARY METHOD FOR THE STUDY OF ARACHNO-PIA

EXAMINATION of the leptomeninges in embedded and stained sections of brain and cord, at best, gives only a limited idea, even when made in series, of the relations and complexity of the varied and delicate parts of these membranes.

It is possible, by floating fragments of fresh or formalin-fixed tissue from water onto a glass slide, adding a drop of glycerine to the surface of the specimen and covering the whole in the usual way, with light pressure on the cover glass, to secure a preparation which can be examined with the dark field.

This gives a more or less stereoscopic picture of all the elements which are present in the tissue, as they appear free from the distortions of routine technic. When suitably prepared, very complete detail is visible. The vascular arrangement is made especially evident, and both intravascular conditions and perivascular spaces and tissues are clearly defined.

The method is of particular value for the study of meningeal concretions as well as of perivascular reactions. When combined with the routine staining technic, which brings out the detail of individual cell structures, this simple method furnishes a valuable supplement, and affords a completeness of examination which can be secured in no other way.

A. E. TAFT

PHILADELPHIA GENERAL HOSPITAL

BOOKS RECEIVED

British Association for the Advancement of Science, Report No. 2, 1940. The Association. London. 5/-.

BROUWER, H. A., Editor. *Geological Expedition to the Lesser Sunda Islands. Vol. I.* Pp. 348. Illustrated. Nordeman. $8.40.

CARR, ARCHIE F., JR. *A Contribution to the Herpetology of Florida.* Pp. 118. University of Florida. $1.35.

CUSHING, HARVEY. *The Medical Career.* Pp. 302. Little, Brown. $2.50.

DICKINSON, FRANK G. and FRANZY EAKIN. *The Illinois Segment of the Nation's Economy for 1935: A Bookkeeping Picture.* Pp. 132. University of Illinois.

DORSEY, N. E. *Properties of Ordinary Water-Substance.* Pp. xxiv + 673. Illustrated. Reinhold. $15.00.

HICKMAN, CLEVELAND P. *Functional Human Anatomy.* Pp. xxxv + 501. 241 figures. Prentice-Hall. $3.75.

Photismi de Lumine of Maurolycus. HENRY CREW, Translator. Pp. xix + 134. 70 figures. Macmillan. $3.00.

POLLACK, HERBERT. *Modern Diabetic Care.* Pp. viii + 216. 13 figures. Harcourt, Brace. $2.00.

SAND, H. J. S. *Electrochemistry and Electrochemical Analysis. Vol. I, Electrochemical Theory.* Pp. viii+133. 9 figures. Blackie and Son, London. 4/6.

SCHNITKER, MAURICE A. *The Electrocardiogram in Congenital Cardiac Disease.* Pp. 147. Illustrated. Harvard Univ. Press. $3.00.

SNYDER, LAURENCE H. *The Principles of Heredity.* Second edition. Pp. xv + 452. 164 figures. Heath. $3.50.

TINTNER, GERHARD. *Monograph No. 5, Cowles Commission for Research in Economics; The Variate Difference Method.* Pp. xiii + 175. Principia Press. $2.50.