SCIENCE

VOL. 100 FRIDAY, SEPTEMBER 1, 1944 No. 2592

SCIENCE: A Weekly Journal devoted to the Advancement of Science. Editorial communications should be sent to the editors of SCIENCE, Lancaster, Pa. Published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington 25, D. C.

LIVING FOSSILS

By DR. DOUGLAS H. CAMPBELL

STANFORD UNIVERSITY

THE simplest organisms, like bacteria and many protozoa and unicellular fresh-water green algae, probably have changed but little during the ages that have intervened since they first came into existence, as their aquatic environment has remained much the same.

A study of the fossil record indicates a similar conservatism in the land plants, including the angiospermous flowering plants, whose earliest known fossil remains from the Cretaceous belong to genera still existing. Of course they must have been preceded by earlier Mesozoic types, but as yet these are unknown.

The importance of fossils, both plant and animals, as indicators in geological formations is of course recognized, but the tendency to emphasize the greater importance of animal fossils might perhaps be questioned.

The fossils of the late Mesozoic and early Tertiary are especially important, since it was in these eras that the origin and evolution of the now dominant angiosperms and mammalia were inaugurated.

Many common American trees, like the sycamore, oak, elm, willow, beech, tulip-tree (*Liriodendron*) and others, are found in the Cretaceous, and it is probable that the forests of the Cretaceous and early Tertiary were not very different from those of the present eastern United States. Since these trees have remained practically unchanged since the late Mesozoic to the present time, they might be termed "living fossils."

The animal life, however, has altered radically. The dinosaurs, which reached their culmination in the Jurassic and Cretaceous, have given way completely to the mammals which at the period of the dinosaur ues are more reliable than the values listed under "potency," since "potency" values depend upon one more variable, that of the initial standard. "Potency" values express the number of times more active a substance is than the standard (potency 1) and are useful to compare the results of different methods of assay. The "½ maximum" values for solubilized liver obtained in the turbidimetric method of Luckey vary considerably from those obtained in the titrimetric method of Teply, but the potency values obtained when solubilized liver is used as the standard agree quite well.

Methods of designating "folic acid" activity which have been used are:

(1) Snell-Peterson unit[1]: The weight of sample needed to produce one half maximum growth or fermentation in 10 ml of a defined medium.

(2) The empirical method[2]: Amount of "folic acid" (potency 40,000). (When this method was inaugurated the Texas group estimated the pure "folic acid" should be 40,000 times as active as their standard.)

(3) Williams milligram unit[10, 11]: The number of milligrams of material of potency 40,000.

(4) Snell milligram unit[12]: This unit is based upon one milligram of the standard (potency 1).

(5) Per cent. purity[9]: This method is based upon material of 40,000 potency arbitrarily set as pure.

(6) Per cent. activity[13]: The activities of the sample and the standard are compared on a percentage basis.

(7) Direct method: Equivalent weight of a crystalline standard. Only an equivalent weight can be expressed since a given sample may contain more than one compound in the folic acid group.

The existence of these various standards, methods and units indicates the need for establishing a uniform procedure for measuring "folic acid" activity.

T. D. LUCKEY
L. J. TEPLY
C. A. ELVEHJEM

COLLEGE OF AGRICULTURE,
UNIVERSITY OF WISCONSIN

AN INEXPENSIVE DECOMPRESSION CHAMBER

WITH the increasing interest in recent years in problems of aeronautics, no doubt many attempts to investigate problems in this field would be undertaken if a decompression chamber were available. It has been our experience that very satisfactory work can be done in this regard with an old type bed sterilizer still attached to a steamline.

The sterilizer we have access to is manufactured by the American Sterilizer Company, rectangular in shape with inside dimensions of 36″ × 42″ × 84″. By disconnecting, for safety's sake, all the steamlines and valves to the chamber with the exception of the one leading past the evacuation valve connected to the inside of the chamber, we contrived a simple but effective decompression chamber which can be evacuated at such a rate that an altitude equivalent to 35,000 feet can be reached in 12 minutes. By adjusting the evacuation valve, any desired altitude below 35,000 feet can be maintained for several hours without any appreciable fluctuation.

To make an observation window or opening through which light, telephone cords or oxygen lines could pass, holes were drilled in one of the doors and sealed with screw caps and plates so that any necessary change for future experimentation could conveniently be made. Up to the present time we have used our chamber to take x-ray pictures of the gastrointestinal tract of dogs at various altitudes and to record various sensations in man when taken to high altitudes.

By removing the x-ray tube we have found that two subjects, and if necessary three, can quite comfortably sit in the chamber at one time. By using an electric fan in the chamber and circulating a constant stream of water through the outside jacket of the chamber, the subjects within the chamber remain quite comfortable. Under these conditions, going to and from altitudes of approximately 30,000 feet, the temperature does not vary more than 6° F. and the relative humidity remains between 62 and 65 per cent.

This type of chamber is easily and cheaply equipped and is adaptable for various types of short- or long-time experiments. This, along with the fact that the chamber can at any time be reconverted to what it was originally used for, commends it for more extensive use.

F. R. STEGGERDA
A. B. TAYLOR

UNIVERSITY OF ILLINOIS

BOOKS RECEIVED

JAEGER, EDMUND C. *A Source-Book of Biological Names and Terms.* Illustrated. Pp. xxvi + 256. 96 figures. Charles C Thomas. 1944. $3.50.

KERR, RALPH W. *Chemistry and Industry of Starch. Starch Sugars and Related Compounds.* Illustrated. Pp. xi + 472. Academic Press, Inc. 1944. $8.50.

MARKHAM, S. F. *Climate and the Energy of Nations.* Illustrated. Pp. x + 236. Oxford University Press. 1944. $3.50.

[8] J. J. Pfiffner, S. B. Binkley, E. S. Bloom, R. A. Brown, O. D. Bird, A. D. Emmett, A. G. Hogan and B. L. O'Dell, SCIENCE, 97: 404, 1943.

[9] B. C. Keresztesy, E. L. Rickes and J. L. Stokes, SCIENCE, 97: 465, 1943.

[10] R. J. Williams, *Jour. Am. Med. Assoc.*, 119: 1, 1942.

[11] H. K. Mitchell, E. E. Snell and R. J. Williams, *Jour. Am. Chem. Soc.*, 66: 267, 1944.

[12] E. E. Snell, *Proc. Soc. Expt. Biol. and Med.*, 55: 36, 1944 (also personal communication).

[13] G. M. Briggs, Jr., T. D. Luckey, R. C. Mills, C. A. Elvehjem and E. B. Hart, *Proc. Soc. Expt. Biol. and Med.*, 52: 7, 1943.