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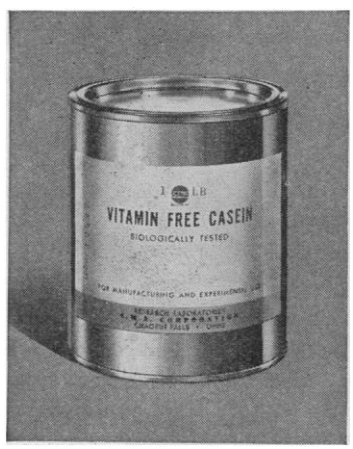
VITAMIN-FREE CASEIN
SMACO

IN VITAMIN EXPERIMENTATION the type of dietary protein employed may well be the most important factor. When Vitamin-Free Casein SMACO is the protein in the deficiency diet, uniform and consistent depletion of test animals occurs well within the required time interval specified by the U.S.P. or other standard test methods. Recent work suggests the suitability of Vitamin-Free Casein SMACO for vitamin K[1] and biotin[2] assay and experimental procedures in chicks.



Vitamin-Free Casein SMACO is prepared in our laboratories by a special extraction process which insures a completely vitamin-free product. Each package bears a control number that identifies the protocols showing rigid biological assay, control of uniformity and freedom from complicating vitamin factors.

Vitamin-Free Casein SMACO has found widespread acceptance in university, pharmaceutical and industrial laboratories. We therefore invite you to try this reliable source of protein in your next biological investigation.

Write for the booklet "Special Products for Nutritional Research" for additional information on Vitamin-Free Casein SMACO, prepared diets for U.S.P. assays, crystalline vitamins and other biochemicals of nutritional interest.

1. ANSBACHER, S.: *Proc. Soc. Exp. Biol. & Med.*, 46:421:1941.
2. ANSBACHER, S., and LANDY, M.: Biotin and Scaly Dermatosis of the Chick. *Proc. Soc. Exp. Biol. & Med.*, 48:3:1941.

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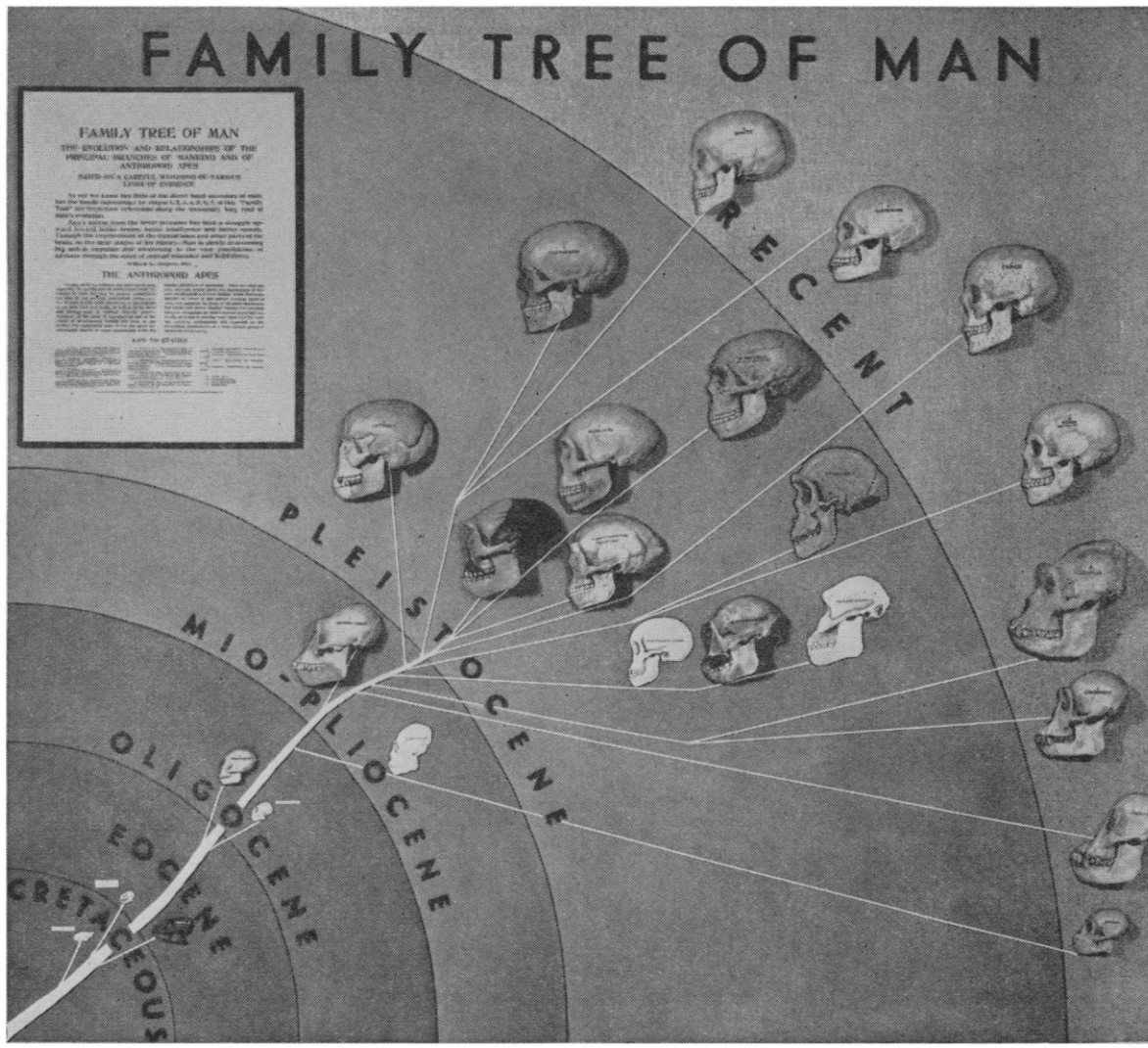
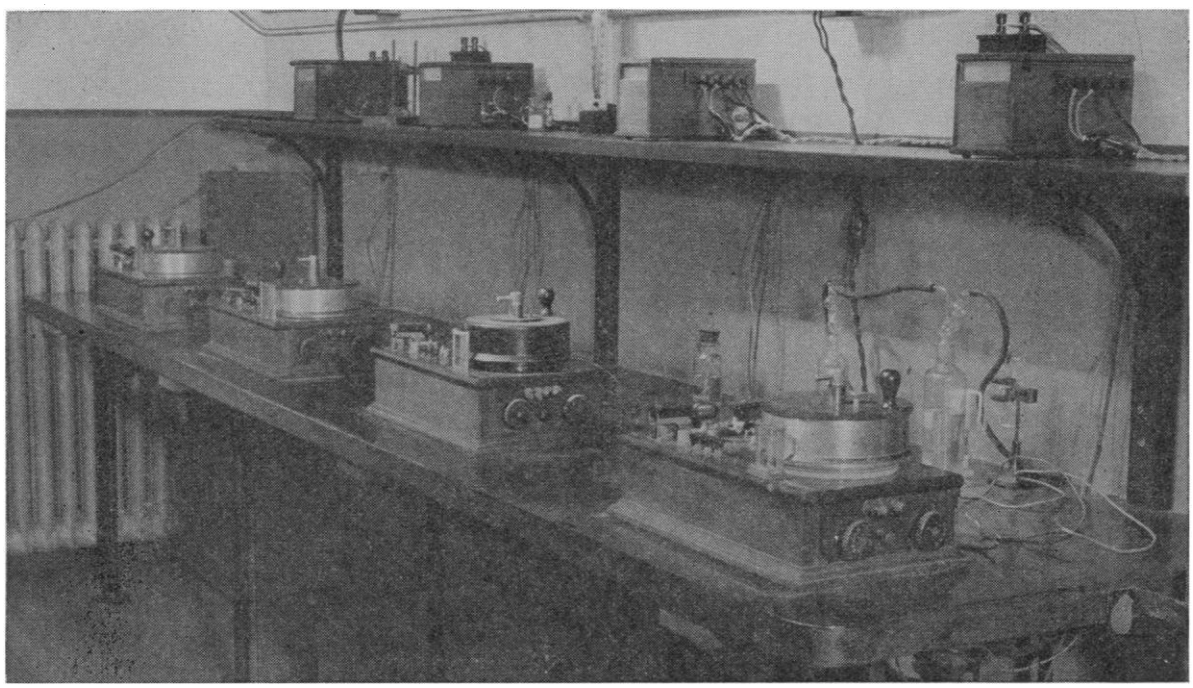


Courtesy American Museum of Natural History

IT is reasonable to assume that an educated person can evaluate current social and political trends more intelligently if he has some first hand familiarity with pertinent biological data on the origin and relationships of the human species, and the genetic basis of individual and racial differences. It becomes increasingly important to present to students the point of view of the biologist towards man, his origin, differentiation into ethnic groups and his present prospects.

For this purpose, Ward's offers numerous aids for graphic demonstration of the history and development of the human species. Shown above is an interesting series of fossil casts and reconstructions as exhibited by the American Museum of Natural History, New York. A series of 17 of these models is available from Ward's, as are also a remarkable series of restorations representing the development of man's facial features—and many other demonstrations.

We invite correspondence and inquiries from interested teachers.



This Convenient Lab Set-Up Aids Student Use Of Type K Potentiometer

Chemistry students at Columbia University find their lab measurements of pH and temperature are greatly facilitated by the efficient arrangement of potentiometer equipment shown above. Each of the four Type K–1 potentiometers is permanently connected to a standard cell, storage battery and galvanometer; the student has only to make his measurements and leave, without any checking of the circuit or signing up for and returning of instruments.

The potentiometers have the regulation two ranges of the Type K–1, 0–1.61 volts and 0–0.161 volt. Two are about thirty years old, and two about twenty; all are in "original" condition except for new slidewires. Our Catalog E gives, on p. 40, the specifications of the modern K–1. It also describes the K–2, which has a third range of 0–0.0161 volt.

The standard cells, one for each potentiometer, are of the best grade, low-resistance type, especially intended for laboratory service. They are described under No. 7308, on p. 14 of Catalog E.

The storage battery, located in a box under the table, supplies all four potentiometers. It is a large-capacity, low-discharge unit, rated 200 ampere-hours at 2 volts. Current drain from all four potentiometers has so little effect on the voltage that the frequency of standardization is greatly reduced, and the battery's long life substantially lessens the operating expense for the four instruments.

The galvanometers are our No. 2420 box-type, with enclosed lamp and scale. We regularly supply them with sensitivity of either 0.04 μa, 0.025 μa or 25 μv per mm scale division. Their period is only 3 seconds. See Catalog E, p. 18.

Catalog E is our condensed general catalog of instruments for research, teaching and testing. It will be sent on request.

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DROSOPHILA AND SPECIATION[1]

By Dr. J. T. PATTERSON

PROFESSOR OF ZOOLOGY, UNIVERSITY OF TEXAS

ONE of the duties of the office of vice-president, if not the only one, is that of giving the address on the occasion of the annual Zoologists' dinner. Examination of a number of the papers which have been read by my predecessors in office shows that the speaker has entire freedom in the selection of his subject and the method of its presentation. The several addresses which were examined deal with various topics, with some enlivened by much subtle humor and others revealing evidence of serious efforts to plumb the depths of the philosophy of biology. For me it seems safer to pursue a middle course.

[1] Address of the retiring vice-president and chairman of the Section for the Zoological Sciences of the American Association for the Advancement of Science, Dallas, Texas, December 30, 1941.

I have selected for discussion a subject which, although venerable, is still capable of holding the attention of biologists. It is now more than eighty years since Charles Darwin posed the question of the origin of species, but until recently we did not have experimental proof of the exact method by which a given animal species might have arisen among wild populations. Following the appearance of Darwin's classical work, and prior to the development of the modern theory of Mendelian inheritance, most investigators were concerned with the problem of establishing the fact of evolution. They used largely the descriptive methods of comparative anatomy, embryology, paleontology and taxonomy coupled with geography. All this work was fundamental and im-

close as could be estimated. Using the ordinary spindle this corresponds to an overall accuracy of around 1/10 mm³ which amount corresponds to around one part in 10,000 of the total delivery capacity of the burette. The total capacity is determined by weighing the mercury delivered by full extension of the spindle. Temperature instability is practically avoided if the volume of the instrument is kept as small as possible. With considerate handling a water-jacket is not necessary.

The solution to be used is sucked into the bulb as shown in the figure and the instrument is ready for use. The size and shape of the burette can be varied according to the special purpose. It is an advantage that it is immaterial for the accuracy of the instrument how quickly the solution is delivered, for the measurement is not affected by solution which sticks to the walls of the capillary.

By replacing the original spindle with a drill rod of smaller diameter the total volume delivered can be reduced to very small limits and still permit accurate measurement of 1/10,000 part. For such a purpose the spindle and screw of the micrometer is first loosened from the thimble (7). The spindle is cut off and in its place is fastened by press fit a carefully alined drill rod of the requisite diameter. An accurate bushing is fitted in the original spindle bearing. The reservoir and washers of this smaller burette are correspondingly smaller, with a bore just large enough to clear the drill rod. The burette bulb likewise is made to correspond to the volume of the drill rod. By using 1/16 inch drill rod such a burette was found to measure delivered amounts with an accuracy of around 1/200 mm³.

A microburette of this type is to be described later as part of a micro gas analyzer. The burette was made by J. D. Graham.

P. F. SCHOLANDER

SWARTHMORE COLLEGE

A METHOD FOR DETERMINING THE CONCENTRATION OF PROPYLENE GLYCOL VAPOR IN AIR

THE discovery that propylene glycol vapor, dispersed in air in very minute concentrations, is capable of destroying air-borne bacteria and viruses[1,2,3] has made necessary the development of a technique for estimating the concentration of this gas in the air. A satisfactory procedure has been found to consist of bubbling 2-liters of the air through 10 cc of water with the aid of a sintered glass filter, and analyzing the propylene glycol content of the resulting solution by the method of Lehman and Newman,[4] modified to accommodate the smaller concentrations involved.

An efficient gas disperser can be made by sealing a circular disk cut from a fairly coarse fritted glass filter, into a glass tube, or can be bought from commercial supply houses. Complete absorption of the propylene glycol is obtained when the rate of sampling does not exceed 1/5 liters of air per minute. If rubber connections are used, the two glass tubes should touch inside the connector, as propylene glycol is quite soluble in rubber.

The contents of the test-tube are quantitatively washed into an Erlenmeyer flask. 1.00 cc of M/10 sodium periodate is added, and the sample is placed in an icebox for 15 minutes. At the end of that time, 5 cc of 7 per cent. $NaHCO_3$ is added, then 2.500 cc of N/10 Na_3AsO_3, followed by 0.2 cc of freshly prepared 20 per cent. KI. The solution is allowed to stand for 15 minutes at room temperature, after which 1 cc of 1 per cent. starch solution is added, and the solution titrated with 0.01N I_2 solution. A blank is run through the same procedure, and the number of milliliters of I_2 solution used in the blank is subtracted from that required by the sample. One cc of .01N I_2 solution is equivalent to 0.38 mgs of propylene glycol.

This procedure has been checked by analysis of samples of air into which known amounts of the glycol have been vaporized. The method is accurate to within .05 mgs of propylene glycol in the analyzed sample. When very dilute mixtures of propylene glycol are being determined (0.1 mg per liter or less), it is therefore necessary to use 4 to 6 liters of air for each sample.

THEODORE T. PUCK

DEPARTMENT OF MEDICINE,
UNIVERSITY OF CHICAGO

[1] O. H. Robertson, Edward Bigg, B. F. Miller and Z. Baker, SCIENCE, 93: 213, 1941.

[2] O. H. Robertson, Edward Bigg, B. F. Miller, Z. Baker and T. T. Puck, *Transactions of the Association of American Physicians*, 1941. In press.

[3] O. H. Robertson, Clayton G. Loosli, Theodore T. Puck, Edward Bigg and Benjamin F. Miller, SCIENCE, 94: 612, 1941.

[4] A. J. Lehman and H. W. Newman, *Jour. Pharmacology and Experimental Therapeutics*, 60: 312, 1937.

BOOKS RECEIVED

ENGELDER, CARL J. *Elementary Qualitative Analysis.* Third edition. Pp. x + 344. Illustrated. Wiley. $2.50.

HAYNES, WILLIAMS. *This Chemical Age.* Full color photographic illustrations. Pp. vii + 381 + xxii. Alfred A. Knopf. $3.50.

LEE, CLARENCE E. *Profitable Poultry Management.* Eleventh edition. Illustrated. Pp. 180. Beacon Milling Co.

RICHTMYER, F. K. and E. H. KENNARD. *Introduction to Modern Physics.* Third edition. Pp. xv + 721. McGraw-Hill. $5.00.

SHUMWAY, WALDO. *Introduction to Vertebrate Embryology.* Fourth edition. Illustrated. Pp. xi + 372. Wiley. $4.00.

WESSMAN, HAROLD EVERETT and WILLIAM ALLEN ROSE. *Aerial Bombardment Protection.* Illustrated. Pp. vi + 372. Wiley. $4.00.