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The Biologically Minded Physician: DR. WM. DEB. MACNIDER 109

Obituary:

Arthur Brooks Clawson: J. F. C. Charles Dwight Marsh: PAUL H. OEHSER. *Recent Deaths* 114

Scientific Events:

Nottingham Meeting of the British Association; Awards of the Ella Sachs Plotz Foundation; Degrees Conferred by the University of Edinburgh 115

Scientific Notes and News 117

Discussion:

A New Household Palm, *Neanthe bella*: DR. O. F. COOK. "Races" and "Homing" of Pacific Salmon: DR. WILLIS H. RICH. *The Fish Bowl as a Fire Hazard*: PROFESSOR KARL S. VAN DYKE. A Possible Source of Laboratory Fires: PROFESSOR I. P. TOLMACHOFF 120

Scientific Books:

Some Recent Books in the Plant Sciences: PROFESSOR PAUL B. SEARS, DR. W. L. BURLISON, PROFESSOR J. J. PIEPER, PROFESSOR CARL D. LARUE, E. J. ALEXANDER, PROFESSOR WALTER F. LOEHWING 123

Special Articles:

Tumor Production by Hormones from *Phytomonas tumefaciens*: PROFESSOR G. K. K. LINK and H. W. WILCOX. Salt Accumulation and Polar Transport of Plant Hormones: DR. F. W. WENT. *The Green Muscardine Fungus on the Periodical Cicada*: SA-

BURO K. KATSURA and DR. A. G. JOHNSON. *The Effect of Repeated Cortin Injections upon Renal Excretion in the Normal Organism*: PROFESSOR FRANK A. HARTMAN, LENA LEWIS and GWENDOLINE TOBY 126

Scientific Apparatus and Laboratory Methods:

A Pleural Cannula: DR. WALTER L. MENDENHALL. The Use of Dialysis in the Preparation and Purification of Immunologically Active Bacterial Products: SAM MORELL and DR. GREGORY SHWARTZMAN 129

Science News 10

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THE BIOLOGICALLY MINDED PHYSICIAN¹

By Dr. Wm. deB. MacNIDER

KENAN RESEARCH PROFESSOR OF PHARMACOLOGY, THE UNIVERSITY OF NORTH CAROLINA

I HAVE often wondered why there were commencement addresses and why an individual should even for the moment assume such a degree of egotism as to gain the belief that he had something worth while to say on such an occasion. The only possible excuse on the part of presidents and deans in commanding such addresses is that it is of their nature to command and in addition such statements which are supposed to be buoyant with thought, tinged with advice, have become a custom, and customs are not bad things; they are at least of some value, in terms of historical continuity. More than likely on some rare and ancient occasion some individual happened to say something worth while to a group of people who were graduating, and then it was that certain high officials in academic life said this must be done each year for ever and ever,

¹ An address to the graduating class of the Medical School of the University of Tennessee, Memphis, March 22, 1937.

and it is done. We have found, I feel, a part of the answer to the question which I have raised, but the important part of this question for you and for me is not answered. Why do I assume for the space of half an hour, when you have been talked at and talked to for four years, that I should catch you and detain you for another period for the same purpose? I can not answer this question except that as a teacher for thirty-seven years I like to be with young people when they commence a great adventure, set their sail and make a start, and because I wanted to be here and feel the great honesty and truthfulness of Dean Hyman and to gather a certain inspiration by subjecting myself to the stimulating intellects of Professors Nash and Gibbs and to find other minds of a like order in your faculty. With such an explanation for my presence here to-night I want to detain you for a bit, not with advice which is ever so free and repugnant, but

two inches in diameter so that the hair will not become entangled in the cannula when the wing-nut is tightened. Having removed the hair, cut a slit about a half inch long between and parallel to the borders of adjacent ribs. You may then thrust the cannula quickly through the muscle tissue between the ribs, turn it through 90° quickly and then fasten the wing-nut. We have found it more satisfactory, however, to incise the intercostal muscles and parietal pleura because occasionally the cannula point strips the parietal pleura from the chest wall and pushes it ahead of it. By this method, the cannula slips in easier and since it is so quickly done, no respiratory distress results in the animal, even if the lung collapses. You can quickly restore the intrathoracic pressure by suction through a T-tube placed in the rubber tubing connecting the cannula with the recording tambour.

WALTER L. MENDENHALL

THE USE OF DIALYSIS IN THE PREPARATION AND PURIFICATION OF IMMUNOLOGICALLY ACTIVE BACTERIAL PRODUCTS*

THE problem of purifying active bacterial products is frequently complicated by the presence of non-specific ingredients derived from the nutrient medium. We have recently employed a purely physical operation, dialysis, to overcome this difficulty. The particular bacterial products investigated were those capable of eliciting the phenomenon of local skin reactivity to bacterial filtrates;¹ the method described, however, appears generally applicable to other bacterial products which are non-diffusible through Cellophane.

It was reported in a former communication² that the active principles of the phenomenon of local skin reactivity to bacterial filtrates are retained by Cellophane membranes. The observations of McClean³ on production of staphylococcus toxin in fluid media diffused through Cellophane suggested the possibility of preparing active filtrates free from non-specific ingredients, as described below.

A diffused broth medium is prepared by immersing Cellophane⁴ bags, containing saline, into nutrient broth. Sterilization is accomplished by autoclaving. After standing at room temperature for 24 hours, the inner contents are inoculated and the apparatus incubated. During the abundant growth in the bags,

* This investigation has been aided by a grant from Eli Lilly and Co., Indianapolis.

¹ G. Schwartzman, "Phenomenon of Local Tissue Reactivity and its Immunological, Pathological and Clinical Significance." Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, New York, 1937.

² G. Schwartzman, S. Morell and H. Sobotka, *Jour. Exp. Med.*, 65: 323, 1937.

³ D. McClean, *Jour. Path. and Bact.*, 44: 47, 1937.

⁴ "Cellophane" No. 600 was used.

observed thus far with many microorganisms, the outside broth remains sterile. The production of potent culture filtrates under these conditions is consistent. The function of the outside broth is to supply diffusible nutrient substances to the growing bacteria. After various periods of incubation, the cultures are removed and filtered. The filtrates obtained in this manner are then redialyzed against saline, in Cellophane bags.² Diffusible substances which have not been rearranged to specific bacterial products are thus removed. In many cases, practically water-clear preparations are obtained. The final dialyzed solutions usually contain about 2 mgms total solids (ash free) and 0.02 mgms total nitrogen. The method is very practical, and large quantities of excellent starting materials for chemical investigations are readily prepared. They are considerably lower in total solids and nitrogen than most of preparations formerly analyzed.²

The filtrates give abundant precipitation with specific immune sera, thus apparently containing a considerable amount of antigenic material. The active principles of the phenomenon present in these preparations are of considerable potency. In the case of meningococcus, the reacting titer approximates one half of that of "agar washings" filtrates. It may be noted that filtrates of meningococcus cultures in fluid media without the use of Cellophane have ordinarily a potency of 1/40 to 1/20 of the "agar washings." These principles are specifically neutralized by immune sera in "multiple proportions."

SAM MORELL

GREGORY SHWARTZMAN

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BOOKS RECEIVED

- BITTER, FRANCIS. *Introduction to Ferromagnetism*. Pp. xi + 314. 147 figures. McGraw-Hill. \$4.00.
 HEILBRUNN, L. V. *An Outline of General Physiology*. Pp. 603. 122 figures. Saunders. \$5.00.
 HOUWINK, R. *Elasticity, Plasticity and Structure of Matter*. Pp. xviii + 376. 214 figures. Cambridge University Press, Macmillan. \$6.00.
 LANGSDORF, ALEXANDER S. *Theory of Alternating Current Machinery*. Pp. xviii + 788. 36 figures. McGraw-Hill. \$6.00.
 MYERS, CHARLES S. *In the Realm of Mind*. Pp. 251. Cambridge University Press, Macmillan. \$2.50.
 NORMAN, A. G. *The Biochemistry of Cellulose, the Polyuronides, Lignin, etc.* Pp. 232. Illustrated. Oxford University Press. \$5.00.
 SENNING, W. C. *Laboratory Studies in Comparative Anatomy*. Pp. ix + 188. 15 figures. \$1.75. *Outline Drawings for Laboratory Studies in Comparative Anatomy*. \$1.50. McGraw-Hill.
 THORNDIKE, LYNN and PEARL KIBRE. *A Catalogue of Incipits of Mediaeval Scientific Writings in Latin*. Pp. xvi + 926. Mediaeval Academy of America, Cambridge, Mass. To members of the Academy, \$9.60. To others, \$12.00.

Recent and Forthcoming Books in Physics

Anderson—Physics for Technical Students. Mechanics and Heat. *New third Edition*

By WILLIAM B. ANDERSON, Oregon State College. 372 pages, \$2.50

A complete revision of this well-known textbook, containing added material and a wealth of new problems. The revision of the second volume, *Sound, Light, Electricity and Magnetism*, will be published in November.

Bitter—Introduction to Ferromagnetism

By FRANCIS BITTER, Massachusetts Institute of Technology. *International Series in Physics*. 314 pages, \$4.00

Defines the problems of which the solution may be expected to reveal the fundamental processes which constitute ferromagnetism and paves the way for a consideration of the subject from the point of view of solid solutions (impure materials) rather than perfectly homogeneous pure substances.

White and Jenkins—Fundamentals of Physical Optics

By H. E. WHITE and F. A. JENKINS, University of California. 446 pages, \$5.00

Presents those principles of the subject which have as their interpretation the classical wave picture of light. The many original diagrams and photographs are a feature of the book.

Shrader—Physics for Students of Applied Science

By J. EDMOND SHRADER, Drexel Institute of Technology. 630 pages, \$4.00

A logical, concise treatment of the fundamentals of physics, giving the student a working knowledge of mechanics, heat, electricity, wave motion, sound, and light.

Shrader—Manual of Experiments in Physics

By J. EDMOND SHRADER. 262 pages, \$2.25

Seeks to impress upon the student's mind the importance of manual operation in clarifying the meaning of the principles dealt with in the textbook, and aims to develop skill in physical manipulation.

Forsythe—Measurement of Radiant Energy

Edited by W. E. FORSYTHE, General Electric Company. 452 pages, \$5.00

A compilation of useful information pertaining to radiant energy and methods of measuring it. The treatment covers the radiation laws, the radiation constants, the method of separating the radiation into wavelength intervals, etc.

Zemansky—Heat and Thermodynamics

By MARK W. ZEMANSKY, College of the City of New York. In press—ready in September

Presents the fundamental concepts and laws of thermodynamics and discusses the technique of applying these principles to specific problems in physics, chemistry, and engineering.

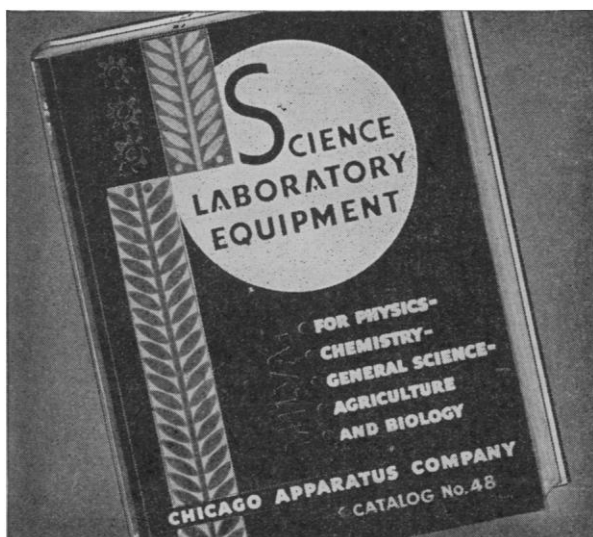
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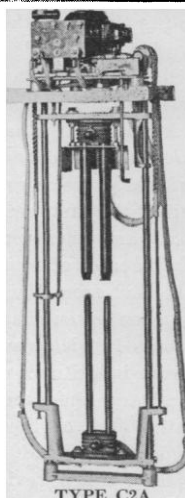
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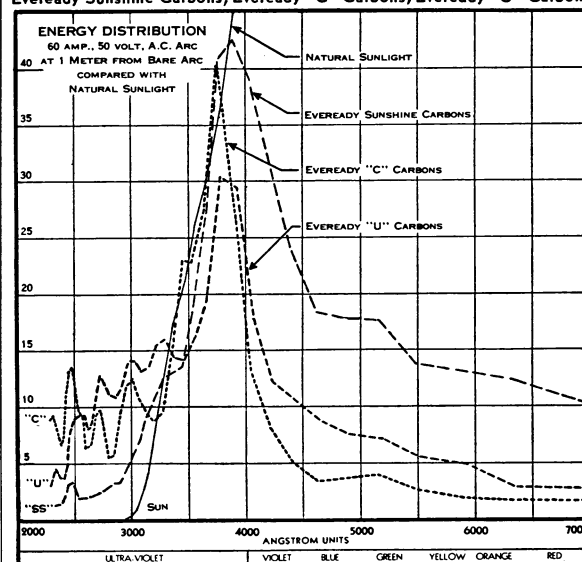
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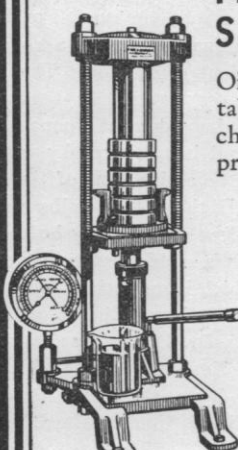
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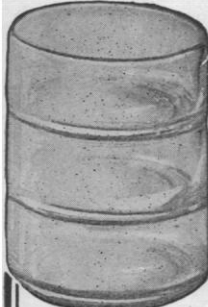
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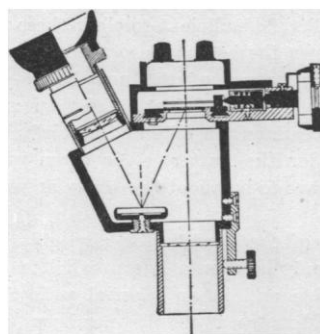
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