SCIENCE

VOL. 86 FRIDAY, AUGUST 6, 1937 NO. 2223

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal

Lancaster, Pa. Garrison, N. Y.

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, D. C.

THE BIOLOGICALLY MINDED PHYSICIAN[1]

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, 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

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

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 communication[2] that the active principles of the phenomenon of local skin reactivity to bacterial filtrates are retained by Cellophane membranes. The observations of McClean[3] 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 Cellophane[4] 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, 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
LABORATORIES OF THE MOUNT SINAI HOSPITAL
NEW YORK

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

1 G. Shwartzman, "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. Shwartzman, 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.

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.