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ANIMAL EXPERIMENTATION IN BIOLOGY AND MEDICINE¹

By Professor A. J. CARLSON

UNIVERSITY OF CHICAGO

THE contributions of experiments on animals to present-day biological and medical knowledge and medical practice is so conspicuous and well known to our profession that my discussion would be out of place in this gathering except for the fact that in a democracy like ours the science and the service of biology and medicine must rest on the broad base of general approval of society and can not be many leagues ahead of the understanding of the average layman. The fact is that there is in our nation still a small body of apparently sane men and women, so poorly informed that they deny the value of animal experimentation for human health and human understanding, men and women so misled that they would,

¹ Address in the Symposium on Animal Experimentation, Pacific Division of the American Association for the Advancement of Science, San Diego, Calif., June, 1938.

if they could, stop by law the humane use of animals by us in our perpetual labor towards understanding and controlling life and death processes. This is a stern reminder that we should forget that part of the oath of Hippocrates enjoining us to secrecy, that we must ever pass on what we have discovered to all our fellow citizens. This teaching must be done with patience, in true humility and without rancor, as the people in the mart and on the ranch have not traveled our path, hence can not possibly see eye to eye with us, without fair discussion. We, who have had the privilege to delve deepest into the nature of life and the control of disease, would be poor soldiers indeed, did we not strive to shield our fellow men from the consequences of their honest but misguided emotions.

The misguided opponents of modern medical re-

alanine. The verification of this observation by chemical analysis will have to await the preparation of sufficient amounts of homogeneous catalase.

KURT G. STERN
GEORGE I. LAVIN

YALE UNIVERSITY SCHOOL OF MEDICINE,
NEW HAVEN, CONNECTICUT, AND
THE ROCKEFELLER INSTITUTE FOR MEDICAL
RESEARCH, NEW YORK CITY

THE ANTIGENIC STABILITY OF WESTERN EQUINE ENCEPHALOMYELITIS VIRUS

It has recently¹ been shown that an especially potent vaccine against equine encephalomyelitis can be prepared from formalinized chicken embryos. The solid immunity that can be conveyed both to guinea pigs and horses² with such a vaccine provides a simple way of studying many properties of the virus responsible for this disease.

It is possible to determine in this fashion whether the virus remains the same from year to year and whether it is greatly altered by passage through different animals' hosts. Such information is essential whenever we seek to protect by vaccination, either with live or killed virus vaccines. It is especially important in the case of encephalomyelitis, because two varieties are already known to exist in the United States. One is active east, the other west of the Appalachian mountains. By all tests these two strains are as unrelated antigenically as two different diseases; an animal immunized to one has not lost any of its susceptibility to the other. We have been studying the homogeneity and stability of the western strain virus by testing the immunity of vaccinated animals to virus derived from as widely different sources as possible.

The guinea pigs for these experiments have been vaccinated with two 0.5 cc doses of chick embryo vaccine injected subcutaneously at an interval of a week. Two weeks after the second injection their immunity has been tested by the intracerebral inoculation of 100 to 1,000 lethal doses of virus. Previous experiment¹ has shown that such animals are completely protected against massive intracerebral inoculation with the virus from which the vaccine was made. In our tests two vaccines have been employed. The viruses for both were derived from the brains of horses dying during the epidemic of 1933.³ One has been passed uninterruptedly through guinea pigs, the other has been through both guinea pigs and horses. No differences in behavior could be seen between the two vaccines. Guinea pigs vaccinated with them have been inocu-

lated with the following strains of virus: (1) Guinea pig passage virus from 1933 brains; (2) the same virus after 60 egg embryo passages; (3) virus⁴ from a 1933 brain after five years of uninterrupted mouse passage, and (4) 1937 field virus after several passages through guinea pigs. One of these 1937 viruses⁵ was from Iowa, the other from Texas. The vaccinated animals have been completely protected against each of these viruses. It is thus apparent that the virus of western encephalomyelitis has not been greatly altered in its antigenic structure by transfer to guinea pigs, mice and chicken embryos. The fact that a vaccine gave complete protection against viruses from localities as widely separated as Iowa and Texas proves that this disease is substantially the same in different parts of the country in which it occurs; since vaccine made with 1933 virus protects against 1937 viruses, we may be confident that vaccines made with previous years' viruses will be effective against the disease that is now epidemic in several mid-western States and Canada.

C. E. BECK

RALPH W. G. WYCKOFF

LEDERLE LABORATORIES, INC.,
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⁴ We are indebted to Dr. P. K. Olitzky, of the Rockefeller Institute, for this strain of virus.

⁵ These virus brains have been obtained from the Bureau of Animal Industry, U. S. Department of Agriculture, through the kindness of Dr. L. T. Giltner and Dr. M. S. Shahan.

BOOKS RECEIVED

- DE LA TORRE, CARLOS and PAUL BARTSCH. *The Cuban Operculate Land Shells of the Subfamily Chondropominae*. Pp. 193-403. 39 plates. 101 figures. Smithsonian Institution.
- HAUROWITZ, FELIX. *Fortschritte der Biochemie, III. Teil (1931-1938); Wissenschaftliche Forschungsberichte, Band 49*. Pp. xi + 172. Illustrated. Theodor Steinkopff, Dresden and Leipzig. RM 9.75.
- LOEB, LEONARD B. *Fundamentals of Electricity and Magnetism*. Second edition. Pp. xxiv + 554. Illustrated. Wiley. \$4.00.
- Memorial Técnico del Ejército de Chile; Año VI, No. 23, Abril, Mayo, Junio, 1938*. Pp. viii + 161-325. 17 figures. Instituto Geográfico Militar, Santiago, Chile.
- MILLER, DAVID F. and GLENN W. BLAYDES. *Methods and Materials for Teaching Biological Sciences; A Text and Source Book for Teachers in Training and Service*. Pp. xii + 435. 146 figures. McGraw-Hill. \$3.50.
- NELSON, EUGENE W. *The Magic Wand of Science*. Pp. 213. Illustrated. Dutton. \$2.00.
- STRAUSBAUGH, PERRY D. and BERNAL R. WEIMER. *A Manual for the Biology Laboratory*. Pp. ix + 183. 114 figures. Wiley. \$1.75.
- VAN HORN, C. E. *A Preface to Mathematics*. Pp. xii + 124. 25 figures. Chapman and Grimes, Boston.
- WAUGH, ALBERT E. *Laboratory Manual and Problems for Elements of Statistical Method*. Pp. x + 171. McGraw-Hill. \$1.50.
- WEBB, WILLIAM S. *An Archaeological Survey of the Norris Basin in Eastern Tennessee*. Bureau of American Ethnology Bulletin 118. Pp. xv + 398. 152 plates. 79 figures. Smithsonian Institution. \$1.00.
- WOODWORTH, ROBERT S. *Experimental Psychology*. Pp. xi + 889. 259 figures. Holt. \$3.80.

¹ J. W. Beard, H. Finkelstein, W. C. Sealy and R. W. G. Wyckoff, *SCIENCE*, 87: 89, 490, 1938.

² B. M. Lyon and R. W. G. Wyckoff, *Veterinary Medicine*, 33: 408, 1938.

³ We are indebted to Dr. B. M. Lyon for these viruses.

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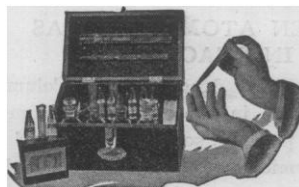
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