Haven 11, Conn. Although hormonal investigations continue to command the interest and support of the committee, preference, in accordance with current policy, will ordinarily be given to proposals for the investigation of neurological, psychobiological and behavioral problems of sex and reproduction.

THE Merit System Council of the State of West Virginia (212 Atlas Building, Charleston 1, W. Va.) announces unassembled examinations for higher positions in the West Virginia State Health Department. These include the position of director of communicable diseases with a salary of from $4,800 to $6,000, and of field clinician (tuberculosis), with a salary of from $3,960 to $5,160. There will be no state residence requirements for these examinations, but preference in making appointments may be given to West Virginia residents. Applications may be filed at any time at the office of the merit system supervisor, from whom further information can be obtained. New registers will be established as soon as a sufficient number of applications have been received to furnish adequate competition.

THE Medical School of the University of Minnesota will erect at a cost of two million dollars a twelve-story building as a memorial to the late Drs. Charles H. and William J. Mayo. The building will be situated at the center of the University Hospital Quadrangle and will form with the present buildings one medical center. These buildings include the existing Student Health Service, the obstetric unit and outpatient clinics, the William Henry Eustis Children's Hospital, the Elliot Memorial Hospital, the George Chase Christian Memorial Cancer Institute, the Todd Memorial Eye, Ear, Nose and Throat Hospital, a future hospital addition and a proposed building for the School of Public Health. All floors of the building from the basement to the fifth floor will connect with the present hospital buildings. A Mayo Memorial Fund has been established to which may be credited private and public donations and appropriations. Headquarters for the fund are at 1126 Northwestern Bank Building.

YALE UNIVERSITY has received a grant from the American Optical Company in support of research on ocular behavior in the general program of the Clinic of Child Development in the School of Medicine. These studies are part of a systematic investigation of the ontogenetic development of behavior in infants and young children. They are being conducted under the direction of Dr. Arnold Gesell in close association with the guidance nursery and the diagnostic service of the clinic.

DISCUSSION

THE AGE OF THE PUNJAB SALT SERIES

No geologist whose vision extends farther than his local horizon can but be interested in the classical sections and fossils of the Salt Range in northwestern India, nor need be reminded of their importance. And similarly there has been no question of Indian geology that has been more debated or that has been more baffling, especially in recent years, than the geological age of the Saline Series of the Punjab.

I have just received a paper,[1] published last September by a distinguished Indian paleobotanist that seems to afford rather convincing evidence on this subject, and since this paper is likely to be missed by numerous geologists, especially in the present abnormal times, it seems desirable to call especial attention to it.

The Saline Series lies beneath unmistakable Paleozoic, and the classic and not often questioned interpretation was that the Salt beds were of Cambrian or pre-Cambrian age, as set forth in Blanford's "Manual of the Geology of India," published in 1878, thus constituting the "oldest known salt beds" (Kayser, p. 76).

Koken and Noetling (1902–03) appear to have been the first to question this, and subsequently several others have taken up the Koken and Noetling views, explaining the observed stratigraphic succession as due to the Paleozoic having been overthrust on the Eocene by the so-called Nummulitic deformation.

It is no part of my purpose to give a detailed or documented account, and those interested can find suitable references in the published "Records of the Geological Survey of India." Professor Sahni's material consists of microscopic fragments, mostly vegetable but also including some insect remains. The former comprise such things as shreds of Conifer tracheids, plant hairs, tiny shreds of leaf cuticles, multiseriate pitted wood cells, etc. If this material was actually *in situ* there seems to be no question as to its post-Paleozoic age, although in all fairness it should be said that Sahni exhibits the proper scientific caution and is not in the least categorical, nor is it my purpose to do more than call attention to the first-hand work on the subject.

EDWARD W. BERRY
THE JOHNS HOPKINS UNIVERSITY

[1] B. Sahni, *Proc. Natl. Acad. Sci. India*, 14: 49–66, 1944.

THE PEACH MOSAIC DISEASE[1]

FIELD experiments in 1942 and 1943 in the Western Slope region of Colorado produced evidence that the

[1] Scientific Series Paper No. 186, Colorado Agricultural Experiment Station, Fort Collins, Colo.

green peach aphid, *Myzus persicae* (Sulzer) could transmit the virus of peach mosaic disease. Carefully controlled experiments carried out in 1943 and 1944 under greenhouse conditions have confirmed the results obtained in the field and prove the ability of this insect to transmit the virus of peach mosaic.

Peach seedlings grown from Georgia native pits under insectproof cages in the greenhouse were used as test trees. These seedlings have never shown symptoms except when vegetatively inoculated.

Cultures of the green peach aphid were taken from peach trees growing in the orchard and maintained throughout the year on plantings of potatoes. Both viviparous apterous and alate forms were used after they had fed for varying periods on the flowers and foliage of diseased peach twigs. In transferring the insects, infested flowers and foliage were cut from a diseased twig and suspended in the top of the test seedling, to which the aphids migrated. Aphids were confined during the feeding periods on infected twigs and on test seedlings in closed glass chambers. The number of aphids and the length of time on the test tree have varied. Eighteen trees out of twenty-five tests have shown symptoms of peach mosaic. Check seedlings of the same age and grown under the same conditions have remained healthy. Under greenhouse conditions the symptoms have tended to be mild; consequently, each test has been followed through at least one period of dormancy and further verified by bark grafting into uninfected seedlings and into June budded Elberta trees. Typical symptoms were produced by these bark grafts. In one of the first cases of successful insect transmission under greenhouse conditions five bark grafts into healthy seedlings produced five typical cases of mosaic in a period of 20 days.

It is not known whether *Myzus persicae* is the only insect that spreads peach mosaic in Colorado. Several other insects more or less common in the peach orchards of the state have been tested, but failed to transmit the virus of this disease.

LESLIE B. DANIELS
COLORADO AGRICULTURAL EXPERIMENT STATION,
FORT COLLINS, COLO.

ANAEROBIC RESPIRATION

THE expression "anaerobic respiration" appeared in an article recently wherein the apparent anaerobic metabolism of a slime mold was described. The article brought forth some kindly and paternal advice from younger physiological chemists, one of whom asked, "Don't you mean fermentation?" Another wrote: "The expression 'anaerobic respiration' is rather startling to a manometrician; even botanists are giving it up. I think it wisest to drop the term and speak of carbon dioxide evolution in all cases, and of fermentation or glycolysis where these apply." That anaerobic respiration should be referred to as fermentation is rather generally held by the new school of physiological chemists who classify organisms as (1) aerobes possessing only oxygen-consuming metabolic systems, (2) strict anaerobes possessing only anaerobic fermentative metabolic systems and (3) facultative organisms possessing both oxygen-consuming and fermentative systems. I accepted the above criticism without comment until there was added the remark that I "as a botanist might get away with the expression." Then I began to wonder whether botanists were "getting away with" a time-honored biological concept, or physiological chemists were "getting away with" a narrow chemical point of view.

What first impressed me as extraordinary was the fact that the broad biological view of respiration was being narrowed down by physiologists, whereas the concept of oxidation was being broadened by the chemists. Thus, although certain physiologists now insist that respiration must involve molecular oxygen, chemists say that oxidation need not involve oxygen at all.

The confusion has arisen because of a redefining of respiration by the new school of physiological chemists. Instead of viewing respiration as a concept, as a complex reaction in living matter whereby energy is liberated, without reference to oxygen or the lack of it, physiological chemists make their own definition, one restricted to a reaction involving molecular oxygen. The biological concept is not only the broader one, but it is the historical one.

Pedantic fealty to definitions pervades, and retards, all branches of thought. Definitions are a necessity. We need them as students in order to understand a new language, but the better we know the language the less need we have for definitions.

Let us accept, for a moment, the definition point of view and see whether or not respiration or fermentation has until now been defined on the basis of oxygen consumption. The biologist regards respiration as that reaction or series of reactions in living matter whereby energy is released for the maintenance of life. E. C. Miller[1] defines respiration as any reaction in which there is a liberation of stored energy in cells; if without oxygen it is anaerobic respiration. Lundegardh[2] views the matter in the broad biological sense when he states that the aerobic process predominates in natural life; anaerobic respiration is a relief when aerobic life is temporarily checked.

The concept "fermentation" was likewise not put on an oxygen or non-oxygen basis. None of the earlier definitions includes or excludes oxygen. Fur-

[1] E. C. Miller, *Plant Physiology*, 1931.
[2] H. Lundegardh, *Ann. Agr. College, Sweden*, 8: 233, 1940.