

for grants are invited. The applicant should state fully the purpose for which the grant is desired; the qualifications of the applicant and the general opportunities and conditions under which the work is to be done. The members of the committee are Ludvig Hektoen, Chicago (1743 W. Harrison St.), Graham Lusk, New York, and Eugene L. Opie, St. Louis, Mo.

MR. GEORGE HENRY VERRALL, formerly Conservative M.P. for East Cambridgeshire, a former president of the Royal Entomological Society, who died on September 16, left his collection of British Diptera and the cabinets in which it is contained to his nephew, James Edward Collin, conditioned upon his offering to the Natural History Museum, South Kensington, three pairs of each species of which he possessed a full series (six pairs constitute a full series), and at least one pair of each species of which he possessed more than one pair; and all his real and personal estate in the parish of Wicken, Cambs, to the National Trust for places of historic interest or natural beauty.

THE Biological Survey of the Agricultural Department has secured the cooperation of the National Zoological Park in experiments in breeding mink for the purpose of ascertaining the possibilities of rearing them in captivity for commercial purposes.

UNIVERSITY AND EDUCATIONAL NEWS

GIFTS of over half a million dollars to the University of California have just been consummated, through the deeding of property by trustees for the late Mrs. Jane K. Sather, of Oakland. Plans have been begun for the Sather Campanile, a lofty bell-tower, for which Mrs. Sather provided some \$200,000. Two professorships are endowed; the Jane K. Sather chairs in classical literature and history will each have an endowment of approximately \$120,000. Endowment is provided for three book funds.

OFFICIAL record has been made in the city of Philadelphia of the transfer of the new tuberculosis hospital built and endowed by Mr. Henry Phipps to the University of Penn-

sylvania. The cost of the new building is \$300,000, and the entire project will represent an outlay of about \$1,000,000.

THE Illinois State Supreme Court has rendered a decision which declares unconstitutional an act of the last legislature which voted an item of \$60,000 for the medical school of the university. As many of the other acts of the legislature were passed in the same manner, there is considerable confusion in the minds of people as to what the outcome may be. It is thought that a special session of the legislature may be called to straighten out affairs.

THE departments of horticulture and plant pathology of the University of Wisconsin have moved into their new building. It is a two-story and basement brick structure, 48 by 128 feet, and with attic space for laboratories. The cost of the building was \$60,000, exclusive of the four greenhouses, potting house and pathologium, situated in the rear of the building. In the basement of the new structure are spray laboratories, fruit rooms and bulb rooms, while the offices, lecture rooms and general laboratories of the horticulture department are on the first floor. The second floor is given over to the plant pathology department, under Professor L. R. Jones. Professor J. G. Moore is at the head of the horticulture department.

THE royal commission on university education in London has recommended a building for the university to be placed on a vacant site of more than 100,000 square feet immediately behind the extension of the British Museum. The site consists of four plots, two on each side of the new British Museum Avenue, on one of which it is proposed that a spacious hall should be built for the university, the other three plots being used for administration, library, small lecture theaters and rooms for graduates. The site is part of the Bedford estate, and it is stated that the Duke of Bedford is prepared to dispose of it for the purposes suggested.

DR. ARTHUR HOLMES, assistant professor of psychology at the University of Pennsylvania,

has accepted the post of dean of the faculties of Pennsylvania State College.

THE following appointments have been announced for the medical department of the University of Pennsylvania: Dr. Edward Lodholz is to be assistant professor of physiology; Dr. W. N. F. Addison, assistant professor of normal histology; Dr. George H. Fetterolf, assistant professor of anatomy; Dr. L. A. Ryan, assistant professor of chemistry and toxicology.

DR. E. T. WHITTAKER, F.R.S., royal astronomer of Ireland, has been appointed professor of mathematics in the University of Edinburgh, in succession to the late Professor Chrystal.

DISCUSSION AND CORRESPONDENCE

REPLY TO HOLMES'S CRITICISM OF "LIGHT AND THE BEHAVIOR OF ORGANISMS"

IN a review of the book entitled "Light and the Behavior of Organisms," which appeared in this Journal, June 23, 1911 (pp. 964-966), the author raised several points that call for elucidation. Before entering upon the discussion of these points, however, I wish to take this opportunity to state my regret in having overlooked the work of several investigators bearing on some of the subjects treated, especially that of R. S. Lillie on the reactions of *Arenicola* larvæ, to which Holmes calls attention.

After referring to the numerous attacks made in the book in question, on Loeb's theories of orientation, Holmes says (p. 964):

Mast's own investigations seem to afford about as good support as has been furnished for the theory which he so persistently attacks.

He then gives two cases in support of his contention:

1. No clearer case of orientation through the local response of the part directly stimulated could well be imagined than the one afforded by *Amæba*, and the author admits that the "method of orientation is in harmony with much in Verworn's theory and also with the essentials in Loeb's." But he adds that "it does not, however, support the idea connected with these theories, that a constant intensity produces a constant directive stimula-

tion." I am not sure that I understand the pertinency of the criticism, for there is nothing in the theories of either of these writers which implies that the actual stimulating effect of any directive agency is subject to no variation.

2. Referring to orientation of *Arenicola* larvæ he says (p. 965):

Orientation in this form is apparently as automatically regulated an activity as one might expect according to the well-known theory of Loeb.

The point at issue here clearly concerns the question as to whether the methods of orientation in *Amæba* and *Arenicola*, as described in my book, are in accord with Loeb's theories of orientation. To settle this question it is of course necessary first of all to understand these theories. I say theories, for, contrary to my critic's assumption, there are three instead of one, as pointed out in my book, pp. 23-35, especially in the summary (p. 54) where the following statement is found:

In 1888 Loeb held that orientation in animals is controlled by the *direction in which the rays of light pass through the tissue*. From 1889 to 1903 he advocated the idea that orientation is controlled by the *direction in which the rays strike the surface, or the angle they make with the surface*. His statements from 1906 to 1909 indicate that he thinks that orientation is regulated by the *relative intensity of light on symmetrically located sensitive structures on opposite sides of the organism*.

The idea that orientation is the result of continuous action of light is common to all of these theories and is undoubtedly their most important distinguishing characteristic. Loeb has repeatedly stated this in unmistakable terms. Witness, *e. g.*, the following statement found in "Dynamics of Living Matter" (p. 135): Heliotropism is "a function of the constant intensity," and the same idea expressed more fully in the same publication on pp. 117-119, 130-131, 138-139. My critic has evidently failed to grasp this idea in spite of the fact that I have repeatedly stated it in different forms in quotations from the references just given and others, indeed even to such an extent that one of my reviewers objects to the repetition as superfluous.

In order to show that an organism orients in accord with Loeb's theories it is conse-