

tension before very long, to enable it to be opened with the rest of the building after the war. This will complete the laboratories as at present proposed, although the foundations have been designed to allow a fourth story to be added at a later date, a wide view having been taken of the future possibilities of the institution.

UNIVERSITY AND EDUCATIONAL NEWS

STANLEY COULTER HALL, the new biology building at Purdue University, erected at a cost of over \$100,000, will be dedicated on May 17. This building has been named in honor of Dean Coulter in recognition of his thirty years of scientific work in the university. The dedication will be held in connection with the spring meeting of the Indiana Academy of Science at Lafayette. Professor Wm. T. Sedgwick, the Massachusetts Institute of Technology; Dr. H. C. Cowles, the University of Chicago; Dr. Carl Eigenmann, Indiana University; President W. J. Moenkhaus, of the Academy; and J. S. Wright, Esq., of the alumni, will be the chief speakers.

WESTERN UNIVERSITY receives \$20,000 by the will of the late William H. Burrows, a trustee of the institution.

THE late William H. Burrows, president of the Middletown National Bank, has bequeathed \$20,000 to Wesleyan University, of which he was a trustee.

By recent action of the board of trustees of the University of Chicago, the president of the university, on recommendation of the head of a department, will welcome doctors of philosophy of the University of Chicago and other universities as guests of the university, with the privilege of attending seminars and of carrying on research in the laboratories and libraries. There will be no charge except for laboratory supplies and a nominal laboratory fee where laboratory work is done.

LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE has adopted the quarter system, to begin on October 1, 1917. By the adoption of this system the school has a continuous session, any three quarters constituting a college year.

The quarter system has been in effect at the Rush Medical College, Chicago, since 1899.

MORRIS M. LEIGHTON, Ph.D. (Chicago, '16), has been elected to the Washington Geological Survey for next year and to an assistant professorship in geology at the University of Washington, Seattle, to take effect on September 1, 1918. Dr. Leighton substituted at the University of Washington during the year 1915-16.

PROFESSOR FREDERICK B. LOOMIS, of Amherst College, has been appointed professor of geology to succeed Professor B. K. Emerson, who is retiring from active work.

DR. WILLIAM G. MACCALLUM, professor of pathology at Columbia University, has resigned to accept the chair of pathology and bacteriology at the Johns Hopkins University and Dr. Adrian V. S. Lambert, associate professor of surgery, has been designated to serve as acting head of the department, vacant by the resignation of Dr. George E. Brewer.

DISCUSSION AND CORRESPONDENCE

WHERE DO PITCHER-LEAFED ASH TREES GROW?

AT the New Orleans meeting of the scientific societies, in 1905, I reported the discovery of a group of pitcher-leafed ash trees (*Fraxinus americana*) near the Station for Experimental Evolution, Cold Spring Harbor, Long Island.¹ These trees had one or more leaflets of nearly every leaf—especially the terminal leaflets—formed into ascidia or so-called "pitchers."

This group of pitcher-leafed trees occupies a definitely circumscribed area, surrounded on all sides by trees with only normal flat leaflets, and I supposed, until a few months ago, that the pitcher-bearing trees were limited to this single small area, and the inference seemed justified that they had originated on this area by a comparatively recent mutation.

Two new localities for this peculiar form were discovered last fall in western Pennsylvania by Professor Charles W. Palmer, of the Westtown School, Westtown, Pennsylvania, and by a friend of his to whom he explained

¹ See SCIENCE, N. S., 23: 201, February, 1906.

the situation. These discoveries indicate that the pitcher-leaved type may be an older form than I had supposed, and that it may have a rather wide distribution. As the peculiar form of the leaflets is readily observed, especially on the young trees, the fact that the occurrence of pitchers in this species has never been published except by myself, and in relation to the trees at Cold Spring Harbor, would seem to indicate that this form probably does not occur in any considerable abundance over extensive areas.

In order to work out their probable evolutionary history, it is necessary to have more complete information regarding the present distribution of these pitcher-leaved ash trees. The reader is requested to assist in securing this information during the present spring and summer, by carefully examining as many young ash trees as may be accessible to him, and reporting the result to the undersigned, giving approximately the extent of area covered by the observations, and the number of *normal* ash trees observed, as well as the number of pitcher-leaved trees—if any of the latter should be discovered. A report is just as desirable in case only normal trees are found as if pitched specimens are found. All communications should be addressed to

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"KEEP YOUR EYE ON THE BALL"

EVIDENTLY my last letter to SCIENCE¹ was not very clear and convincing, for Mr. Patterson² in a recent number insists on making the inertia-reaction of an accelerated body act upon the body itself and thus oppose the accelerating force. To him the term "unbalanced force" means "*a force opposed only by inertia-reaction.*"

In avoiding confusion as to the part played by this force of reaction in any case, I have found it useful to adopt a motto from the royal

¹ "Can a Body Exert a Force upon Itself?" SCIENCE, Vol. XLIV., p. 747, 1916.

² "When Is a Force Not a Force?" Andrew H. Patterson, SCIENCE, Vol. XLV., p. 259, 1917.

game of golf—"Keep your eye on the ball." When a ball is swung on the end of a cord, the centripetal force exerted by the stretched cord *on the ball* is unbalanced and produces the centripetal acceleration of the ball. There is the whole story as far as the ball is concerned. The inertia reaction of the ball acts *upon the cord* and through the cord acts *upon the hand*. The law of motion states that the rate of change of momentum of any body is at each instant proportional to the resultant of all the forces acting upon that body. In applying the law to a given body *A*, keep your eye on *A* and consider only the forces acting upon *A*. Among these forces, the inertia-reaction of *A* is never to be included since it always acts upon some other body or bodies.

Mr. Patterson would have us believe that inertia-reaction and friction are not full-fledged forces in the single definite sense implied in the laws of motion. He says neither can produce positive acceleration. Let us see if this is true.

Consider the experiment in which two masses, connected together by a string and free to slide along a horizontal rod, are rotated about a vertical axis. If the distances from the axis are in the right ratio, the masses will rotate without sliding, the inertia-reaction of each mass accelerating the other.

Then take the case of a passenger leaning forward as he stands on a starting train. The forces acting *on him* are his weight, the upward elastic reaction of the floor which balances his weight, and friction. He is being accelerated, and friction is doing it.

Even though some forces are always pulls, others always pushes, and others neither, we need not differentiate between them since each tends to produce acceleration in a certain direction.

Let us agree, then, that a body can not exert a force upon itself; that all forces are similar in their effects; and that in applying the laws of motion to any body, care should be taken to consider only the forces acting upon it.

GORDON S. FULCHER

WISCONSIN UNIVERSITY,
March 24, 1917