subject will be "The Debt of the World to Optical Science."

DR. E. RABINOWITCH, of University College, University of London, will give the John Howard Appleton Lecture of Brown University for 1937–38 on February 28 on "The Photochemistry of Chlorophyll and the Problem of Photosynthesis."

DR. HARALD U. SVERDRUP, director of the Scripps Institution of Oceanography, La Jolla, on February 9 addressed the California Chapter of Sigma Xi on "The Current Systems of the Oceans."

DR. VICTOR HEISER, of the Rockefeller Foundation, spoke on February 14 at Duke University on the public health work done in tropical regions by American physicians. On January 31, Dr. E. G. Crabtree, of the Harvard Medical School, gave a lecture on the "Fluid Balance in the Puerperium."

DR. WILLIAM DE B. MACNIDER, of the University of North Carolina, delivered on February 10 the Brown-Sequard lecture of the Medical College of Virginia, Richmond, on the general subject of acquired cellular resistance.

DR. MAURICE E. BINET, a member of the French Academy of Medicine, president of the Society of Medical Science of Vichy, France, who is making a tour of the United States, recently delivered an address on "Hepatic Insufficiency in the Course of Chronic Colitis" at the Hahnemann Medical College, Philadelphia. Following the lecture the honorary degree of doctor of laws was conferred on him by the college.

DR. F. R. MOULTON, permanent secretary of the American Association for the Advancement of Science, was the principal speaker at the fourteenth annual science luncheon, which was held on February 19 in New York City. Associate Superintendent William E. Grady was toastmaster. The luncheon was sponsored by the Science Council, the Chemistry Teachers Club of New York, the General Science Teachers Association, the New York Association of Biology Teachers, the Physics Club of New York, the Physiographers and Geographers Club and the Association of Laboratory Assistants. An exhibit of recent developments in apparatus and teaching technics was on display.

THE third International Cancer Congress under the auspices of the International Union against Cancer will be held in the United States, from September 11 to 16, 1939, at the Haddon Hall Hotel, Atlantic City, N. J. The president of the congress is Professor Francis Carter Wood, director of the Institute of Cancer Research of Columbia University, New York City; Dr. Donald S. Childs, of Syracuse, N. Y., is the secretary-treasurer, and Dr. A. L. Loomis Bell, of Long Island College Hospital, Brooklyn, N. Y., is in charge of transportation and exhibits. The proposed sections are as follows: General research; biophysics; genetics; general pathology of cancer; surgery of cancer; radiological diagnosis of cancer; radiotherapy of cancer; statistics; education. Further details concerning section chairmen, committees and other data will be announced later. The membership fee will be $15. All inquiries should be addressed to the Institute of Cancer Research, 1145 Amsterdam Avenue, New York, N. Y.

BY the will of the late Edward Bayard Halsted, retired stock broker, Johns Hopkins University and Duke University, Durham, N. C., share equally in the residuary estate of undetermined value, which is believed to be in excess of $500,000. The income from the bequest to Johns Hopkins is to be used "for research work for the advancement of knowledge as to the nature, causes, means of prevention and cure of such maladies as may in the opinion of the governing body be in need of further study and investigation." The fund is to be known as the "E. Bayard Halsted Fund for Medical Research." The university also receives $200,000 on the termination of two trusts. The bequest to Duke University is for the establishment of four scholarships in medicine, science, journalism and history, each for $60,000. Duke also receives $75,000 on the termination of a trust.

MRS. MARION E. STERN, daughter of Julius Rosenwald, has given $75,000 to the University of Chicago. Mrs. Stern reserved the right to specify the educational uses to which the money may be put and has approved the expenditure of $5,000 in scholarships to needy and deserving students.

A FOUNDATION for the furthering of scientific research has been established at Stockholm by Dr. and Mrs. Axel L. Wennergren, with an endowment of a million dollars. Dr. Wennergren is president of the Electrolux Company.

DISCUSSION

FALLING CHIMNEYS

IN the issue of SCIENCE (No. 2176, Vol. 84), published on September 11, 1936, there appeared an article entitled "Concerning Falling Chimneys," which seems to be, in part, in error. The author says:

A simple analysis shows that, since all points of the

chimney are moving with angular acceleration along the arcs of circles prior to the break, the center of percussion of the chimney is the point which has the natural acceleration of a particle moving under gravity along the same path. All parts of the chimney below its center of percussion are retarded; all parts above move with acceleration greater than they would have if constrained to move along the same paths under gravity alone. Hence there is an inertial reaction of the upper portion of the chimney which is opposite to the direction of motion, and the top lags behind. Breaks, if they occur at all, appear first above the center of percussion.

The last assertion about the location of breaks when they occur is obviously not true in the case of the falling chimney shown in the accompanying picture taken from the *Philadelphia Record* of October 8, 1937, since the center of percussion is always above the center of gravity. It is not far wrong to consider that a tall chimney acts like a rod. For a thin rod of height h, turning freely about a point at its lower end, the center of percussion is $2/3\ h$ from the bottom.

In the idealized case of a rod, turning freely about its lower end on a fixed pivot, the angular acceleration is $a = 3g \sin \theta/2h$ when the rod is inclined at an angle θ to the vertical. For a particle sliding down a smooth, fixed, vertical circle of radius r, the linear acceleration is ra. When the radius to the particle makes an angle θ to the vertical this acceleration is also $g \sin \theta$; hence when $r = 2/3\ h$ the two angular accelerations are equal. So the author's statement about the location of the point that has the natural acceleration of a particle moving under gravity is correct. However, the implication that the effect of inertial reaction is greatest at this point or above it is incorrect.

If we consider a section of the rod lying above a point X (see Fig. 1), at distance x from the lower end

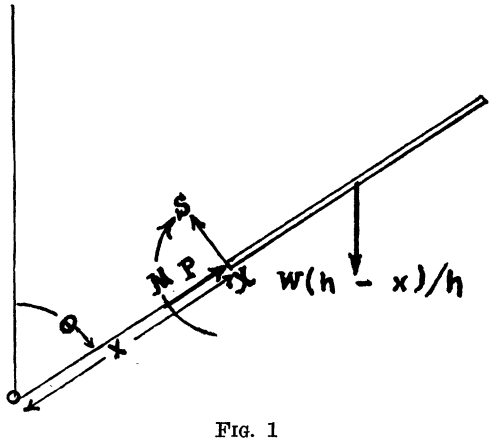

FIG. 1

of the rotating rod, it is seen to be acted upon at X by a moment or torque M, a shear S and a compression P, all arising from the action of the section below X. It is, also, acted upon by its weight at its center of gravity $\frac{1}{2}(x+h)$ distant from the bottom. If the rod breaks because of the motion, the break may be caused by shear, by moment or by a combination of the two. If caused by shear alone it is most likely to occur where the shear is greatest; if caused by moment alone it is most likely to occur where the moment is greatest. A brick chimney will not stand much shear, but brickwork is not assumed to be able to stand any moment, since moment involves tension. Brick and mortar are very easily pulled apart.

From the equations of motion for the part of the rod above X we find for the shear S,

$$S = W \sin \theta\ (h-x)\ (h-3x)/4h^2 = W \sin \theta\ (h^2-4hx+3x^2)/4h^2,$$

in which W is the weight of the rod. It is seen that the shear is zero for $x = h$ and for $x = 1/3\ h$; that is, at the upper end and one third the length from the bottom. The shear is a mathematical maximum where $x = 2/3\ h$; that is, at the center of percussion. But at the bottom it is three times as great as at this point. If the chimney should break from shear it is most likely to occur near the bottom. The picture from the newspaper indicates that this has occurred in the case of the chimney at Springfield, Delaware Co., Pa.

The equations of motion for the part above X, also, give for the moment M,

$$M = Wx\ (h-x)^2 \sin \theta/4h^2 = W(h^2x-2hx^2+x^3) \sin \theta/4h^2.$$

It is seen that M is zero for $x = 0$ and for $x = h$; that is, the bending moment is zero at both ends of the rod. The moment is a maximum for $x = 1/3\ h$; that is, at one third the length from the bottom, the moment is greatest. If the chimney breaks from moment alone the break is most likely to occur about one third the way from the bottom to the top. It would seem that the chimney shown in the picture is breaking, at the upper break, from moment largely, which is what one expects in a brick chimney.

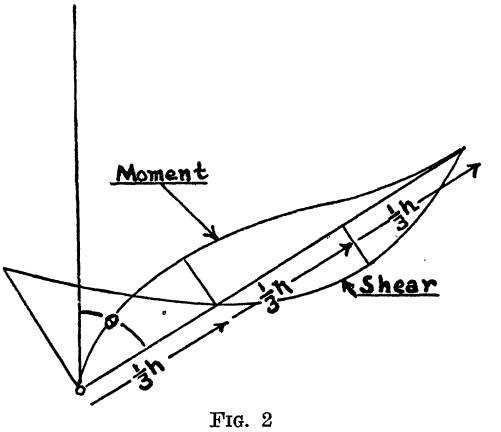

FIG. 2

Fig. 2 shows how the moment and shear vary at points along the length of the rod. The moment causes compression on the upper side of the rod and tension on the lower side. We would expect a crack caused by moment to run from the lower side towards the upper side. This state is seen in the picture.

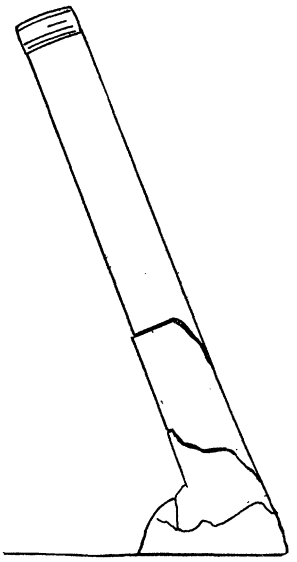

FIG. 3

None of the theories of rupture assume that rupture is caused by shear or moment independently. It would seem that the contention that rupture, if it occurs at all, will happen at or above the center of percussion is unfounded.

JOSEPH B. REYNOLDS

LEHIGH UNIVERSITY

CRASPEDACUSTA NEAR ALBANY, NEW YORK

SOME years ago the pages of SCIENCE carried frequent mention of the occurrence of the medusae of the fresh-water coelenterate, *Craspedacusta sowerbii*. One of the authors, Dr. Waldo L. Schmitt,[1] expressed the opinion that this form would be found to be "more common and widely distributed in the fresh waters of the eastern and eastern central United States, at least, than heretofore believed." Dr. Schmitt's prognostication of ten years ago has proved to be correct, and this beautiful jelly-fish has been recorded rather widely from Oklahoma to New York.

Although the known distribution includes New York State, perhaps a specific note of its local occurrence will augment the available detailed locality records.

[1] Waldo L. Schmitt, SCIENCE, 66: 591–593, 1927.

On August 16, 1937, Mr. C. L. Harpham, of Loudonville, a village three miles north of Albany, N. Y., telephoned me that he believed jelly-fish inhabited the fish pool on his lawn and invited me to inspect it. He had observed these unusual forms in the pool earlier this season, but had not suspected their identity until his attention was drawn to a newspaper account relating the recent acquisition of a number of fresh-water medusae by the New York Aquarium.

That evening I examined the water in the pool and found the jelly-fish as Mr. Harpham had described. The medusae intermittently swam freely near the surface, then sank out of sight. It seemed, however, that the animals spent more time in the depths than at the surface. A stream of water from a garden hose directed into the pool caused the medusae to rise to the surface in numbers, but they soon disappeared below.

About fifty of the medusae were collected, after which their apparent prevalence in the pool seemed to have been in no wise diminished. Upon subsequent laboratory examination of the preserved specimens they were definitely determined as *Craspedacusta sowerbii* (Lankester).

The live medusae which I collected in jars of water from the pool along with scrapings from its sides and a few plant stems, lived for only a little more than twenty-four hours in the containers. While alive they moved about freely and appeared to feed on the minute organisms in the lumps of algal growth. Microscopic examination of the gonads indicated that the contents had been discharged before we captured the medusae.

The rock-lined fish pool carrying the jelly-fish occupies the center of a flower garden near one end of the Harpham residence, which is situated on a high hill at the outskirts of Loudonville village. It is approximately 9½ feet long, 6½ feet wide and 2½ feet deep, while its margins rise only an inch or two above the surrounding closely cut grass. Water in the pool is supplied in part from the village standpipe and in part from rains which have been more than usually copious this summer. However, the elevation of the pool is such as to preclude the entrance of flood waters from any source.

A small clump of narrow-leaved cat-tail (*Typha*), arrow-arum (*Peltandra*), yellow pond lily (*Nymphaea*) and several other aquatic plants were growing in the water of the pool. Its rock sides carried fine debris intermingled with a rich algal growth in which, upon microscopic examination, protozoans, rotifers and round worms of various types were found to be the dominant forms of animal life. Several well-kept goldfish also inhabited the water.

During past winters some of the plants were re-