stand the mechanism of simple and familiar natural phenomena. I will give only two illustrations, but these, I hope, will make you see how easy it is to find around us simple phenomena that are not well understood.

Every chemist knows that after he stirs a liquid in a beaker having a precipitate in the bottom, the precipitate collects near the center. Probably few of you know why this is so. It is not due to the slower velocity of rotation near the center, nor to the slower motion with respect to the glass. This is proved by the fact that if you put the beaker, with the precipitate in suspension in the liquid, upon a rotating table, the precipitate will collect in a ring as far from the center as possible, although the relative angular motion of the beaker and its contents are the same as before. A little study proves that the phenomena are due to unbalanced centrifugal forces. For example, when the liquid is stirred, so as to set it in rotation, centrifugal force produces a greater hydrostatic pressure near the walls of the beaker. But the liquid very close to the bottom surface of the beaker, because of friction, can not rotate so fast, and therefore the centrifugal force is not so great and does not counteract the radial hydrostatic pressure difference existing in the upper layers. The liquid in contact with the glass bottom is thus forced inwards and carries the precipitate with it.

The phenomena connected with the formation and the disappearance of ice in a large lake, such as Lake George, have interested me for years. One clear night at the end of December, when the water of a large bay was at a uniform temperature of not over 0.2° C. and the air temperature was −22° C., ice which formed slowly at some places on the shore, melted in a couple of minutes when pushed out a few meters from the shore. There was no wind in the bay, but a slight breeze over the central part of the lake caused a very slow circulation of water in the bay with a velocity of perhaps 1 or 2 cm. per second.

In contrast with this consider the phenomena observed one clear afternoon of the following April. The body of the lake was still covered with ice which was about 20 cm. thick, but close to the shore there were places where the ice had melted back for a distance of 5 meters or more. Although the air temperature was +3° C. and the water 10 cm. below the surface was at +2.5°, ice crystals about 50 cm. long formed in these pools in less than half an hour. After considerable analysis I believe I can explain this apparent paradox by the stability in the stratification of the water in April caused by the denser underlying warm water which had been heated by the sun. With this stability which prevented vertical convection the surface water could freeze because of the radiation into the clear sky. But in December the water temperature was so uniform that the differences of density were not sufficient to prevent vertical circulation, and thus the surface could not cool to the freezing point.

It appears then that a pool of water at +1° C., exposed to cold air with a slight wind can be made to freeze more rapidly if the water is heated from the bottom. Sometime I want to try this as an experiment.

All hobbies, however, stimulate individual action, and many develop wholesome curiosity. The child should acquire them early, and our educational system should foster them.

IRVING LANGMUIR

RESEARCH LABORATORIES,
GENERAL ELECTRIC COMPANY,
SCHENECTADY

JAMES CAMPBELL TODD

JAMES CAMPBELL TODD died at his home in Boulder, Colorado, the evening of January 6, 1928, following a long illness.

Born in Shreve, Ohio, March 17, 1874, he graduated from Wooster College in 1897, with a degree of bachelor of philosophy. He continued his studies in the University of Pennsylvania School of Medicine, from which he received the degree of M.D., in 1900.

While in Wooster College he held the position of assistant in biology during 1895–96. From 1900–01 he was resident physician in the Allegheny General Hospital, Pittsburgh. About this time his health failed, and he moved to Colorado, where he located in Denver.

He soon became identified in the field of medical education, first as assistant of pathology in the Denver and Gross College of Medicine during 1904–05, then as lecturer from 1905–08, later as associate professor from 1908–10, and assumed the professorship of the department in 1910.

On January 1, 1911, the University of Colorado School of Medicine absorbed the Denver and Gross College of Medicine, the two faculties were merged, and Dr. Todd became professor of pathology in the Boulder Division. He also acted as the secretary of this division until 1916. Since 1923 he has been premedical adviser in the university.

As the study of pathology broadened he felt that he was losing the contact in the fields of hematology and parasitology he desired. So in 1916 he became professor and the head of the department of clinical pathology which had just been created at his request. These positions he held at the time of his death.

During these years ill health became an increasing handicap, but in the face of these difficulties he showed a determination and persistency of purpose that won the admiration of both students and faculty. And his enthusiasm for his work was transmitted to all who had the pleasure to work with him. He was ever willing to aid, and considered the rôle of a teacher as his highest ambition.

Early in his teaching career he found that little or nothing had been compiled in clinical laboratory methods of value to the general practitioner. The collecting and testing of such laboratory procedures became his life work. He kept the viewpoint of the average medical man before him, and simplicity of technic as well as the accuracy of results claimed his closest attention.

His book "Clinical Diagnosis by Laboratory Methods" first appeared in 1908, and in the different editions he placed all his writings, with the exception of a few early articles. This book has become established over the world as an authority in its field, and it has with few exceptions enjoyed as widespread a distribution as any medical book published in English. He was sole author of the first five editions. The sixth edition, which came out in September, 1927, was written in collaboration with Dr. Arthur Hawley Sanford of the Mayo Clinic. His determination and perseverance may be realized by the fact that the work on all editions of his book was done while bedfast or in a rocking-chair.

In recognition of his ability in his field Dr. Todd was the recipient of many honors. Modest to the point of bashfulness, he would seldom speak of his own work except in a reticent manner. But his opinions on diagnostic methods always demanded respect, for they were given only after due consideration, and then in a decisive manner.

He became a fellow of the American College of Physicians in 1922, was a member of Sigma Xi, and was given honorary membership in Phi Beta Kappa by his Alma Mater in recognition of his ability and learning. He was a fellow of the American Association for the Advancement of Science, a fellow of the American Medical Association, of the American Society of Clinical Pathologists, and an honorary member of the Colorado Society of Clinical Pathologists.

Four years ago he was compelled to give up active teaching, but kept in close touch with the affairs of his department, the university and the world. He read much, not only in his particular field, but on general subjects. He will be missed in particular by his old students, and by faculty members of the university, who enjoyed his ability as a conversationalist, who admired him for his accomplishments, respected his ability and scholarship, and whose memory will be cherished as that of a man whom all could well emulate.

E. R. MUGRAGE

DENVER, COLORADO

SCIENTIFIC EVENTS

THE ARNOLD ARBORETUM

CONTRACTS for a new and larger greenhouse and nursery for the Arnold Arboretum, according to the *Harvard Alumni Bulletin*, have been signed, and work will proceed at once. The land opposite the Jamaica Plain entrance, outside the arboretum, at the corner of Center and Prince Streets, on which the greenhouse now stands, has been sold. The new site is on the South Street side of the arboretum, on the rising ground of the Bussey Institution, adjacent to the Bussey greenhouse range.

A new feature of the greenhouse will be a laboratory fully equipped for research in plant pathology and genetics. The greenhouse will be about fifty feet long, and will have, also, a workroom for potting, and pits for the growth of woody plants. The nursery, a few feet away, will cover about three acres of land.

Professor Oakes Ames, supervisor of the Arboretum and of the Harvard Botanical Museum, and chairman of the council of botanical collections of the university, made the following statement in regard to the plans for the arboretum:

We want to make the arboretum a world center not only of systematic dendrology, but of dendrology as a whole. The proximity of the new greenhouse to the Bussey Institution will make possible a closer cooperation than has been possible heretofore. The Arnold Arboretum is the only one in the United States which is connected with a university and can draw upon the specialists in its faculty for scientific help.

Already we have in view for these courses two men in the first rank in their fields, although no definite arrangements have been made to secure their services. If we succeed in getting the right man for the course in plant pathology this work will begin about July 1. Dr. East, at the Bussey Institution, will supervise the work on genetics. We shall also add to the staff another systematic botanist whose field will cover the woody plants of tropical America.

The assembling of rare species and varieties of plants will be continued, of course, so that the arboretum may remain in the forefront of gardens of its type. It is expected that Dr. Joseph F. Rock, who has returned to China and is conducting explorations for the National Geographical Society, will again serve the arboretum, and will classify many of the plants which he sent us from Kansu and Tibet. This spring, Professor J. G. Jack and Alfred Rehder, of the arboretum staff, will collect new plants at the Harvard Botanical and Zoological Station at Soledad, Cuba.