land, California; the 18-inch visual objective at the University of Pennsylvania; a twin doublet of 16-inch aperture at Heidelberg, Germany; a 72-inch reflector at Victoria, B. C., and the 15-inch photographic Loomis coelostat at the Yale Observatory, New Haven. This telescope has a focal length of fifty feet, and is the third longest telescope in the world.

Another of his achievements was the construction of an anastigmatic magnifier which is very widely used.

Two or three years before his death, he perfected an improvement in the microscope, which he regarded as highly successful and important, but his increasing disabilities prevented his communicating the detail of his design, and it is to be feared that his results are lost to the world.

Hastings was always interested in all optical phenomena. In 1920, he published a general theory of halos, on the hypothesis of two simple kinds of ice crystals, by which he was able to explain all the general features of complex halos.

His published works number some forty odd pamphlets, and the following three books: "General Physics," written in collaboration with Frederick E. Beach, in 1898; "Light," which was published in 1901, as one of the Yale Bicentennial Publications, and "New Methods in Geometrical Optics," published in 1927.

He was a man of wide culture, and deeply interested in literature, art and architecture. In 1909, after extended study of the notable asymmetries of the Cathedral of Pisa, and other European churches, he published a paper, "On the Architectural Refinements in Medieval Churches."

Hastings was always uniformly cordial but possessed a personal dignity through which one rarely passed to familiarity. He will always be remembered as a courtly gentleman of the old school.

FREDERICK E. BEACH

RECENT DEATHS

DR. LOUIS AGRICOLA BAUER, director emeritus of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, died on April 12 as the result of a fall from a window of his apartment. He was sixty-seven years of age.

J. HAMMOND SMITH, of the College of Engineering of the University of Pittsburgh, died suddenly on April 13. He was sixty-five years old.

DR. DONALD R. DICKEY, research associate in vertebrate zoology at the California Institute of Technology, died on April 15, at the age of fifty-five years.

PROFESSOR CHARLES G. SIMPSON, professor of mathematics in the School of Engineering, Milwaukee, died on February 5, at the age of sixty years.

H. CHAPMAN JONES, formerly for many years senior demonstrator in chemistry in the Royal College of Science, London, died on March 7, aged seventy-seven years.

SIR HORACE PLUNKETT, first vice-president of the Department of Agriculture and Technical Instruction for Ireland, known for his contributions to Irish agriculture, died on March 26, aged seventy-seven years.

THE death is announced, at the age of seventy-eight years, of Sir Patrick Geddes, in Montpellier, France, where he was director of the Scots College. He was distinguished as a biologist and had held teaching posts in London, Aberdeen, St. Andrew's and Edinburgh universities.

SCIENTIFIC EVENTS

A NEW TUBERCULOSIS BUILDING AT THE PASTEUR INSTITUTE

To the Institut Pasteur de Paris has been added, according to the Paris Correspondent of the *Journal* of the American Medical Association, a large five-story building, erected in the gardens and reserved for studies on tuberculosis and for the preparation of the B C G vaccine, the demands for which have constantly increased, coming from all parts of the world. Only 890 doses were sent out in 1924 and in 1931, 101,646 doses. Since the creation of the B C G vaccine, 414,198 vaccinations have been performed. The new building cost $400,000, and was recently formally opened by the minister of public health, with the attendance of representatives of the medical press and numerous scientists. Mr. Calmette himself conducted visitors about the building. He showed the first strains of the B C G vaccine, which date from February 8, 1908. The transplantations of the cultures, from week to week, on ox bile were kept up until 1919, in order that the bacillus should become absolutely harmless, and it was not until five years later, experiments having been constantly made, in the meantime, on animals, and the demonstration having been made that the bacillus could not regain its virulence, that Calmette and Guérin decided to apply their vaccine to man. The recent Lübeck tragedy has clearly proved that only the introduction of virulent bacilli into the cultures can deprive them of their harmlessness. In the preparation of the vaccine, the most rigorous asepsis is followed. Every week transplantations of the cultures, which are preserved in baths at a temperature of 38° C., are made. The collected emulsion is distributed in tubes of 1 cc capacity, and