would never be a great composer, he abandoned music for chemistry, success in anything but creative work being not good enough for him. His father was a Jewish manufacturer, his mother a Scotswoman, and the combination produced five sons of extraordinary but diverse abilities, Erwin, for example, having been the first astronomer to uphold Einstein's views.

The funds available to Freundlich for research were incredibly small—I believe about £60 annually. But he was one of those experimenters able to obtain fundamental results with the simplest means. His laboratory was one more example of the extraordinary fact that important work very frequently comes from badly equipped laboratories. He had an extraordinary aptitude for clearing up, by well-directed experiments linked with a critical examination of other results, groups of phenomena of the complicated type occurring in colloid chemistry. His later work in ultrasonics and thixotropy are examples of this.

Freundlich went to Dahlem in 1917, where for seventeen years he directed a large research school, and spent his happiest and most productive years. He left Germany (as a protest against Nazi interference with his choice of collaborators)—*schlagartig*—using, as he said, the Nazis' own slogan. He went to University College, London, taking his apparatus—a gift of the Rockefeller Foundation. But he was now a different man owing to a domestic bereavement rather than political persecution, which indeed he had only experienced in the persons of his assistants in Dahlem. For this reason, perhaps, his personality was much less appreciated than I had expected.

At the time of his leaving for the United States, Freundlich showed no signs of physical or mental enfeeblement. He is said to have died from a heart-attack, and he never took exercise. But he was a sparely built man, and in the Braunschweig days could walk many a sportsman off his feet when he chose. I sometimes wonder whether he did not take life "to heart" much more than ever he showed, and whether this last exile to an extremely trying climate may not have ended prematurely a life which might now be rendering Great Britain valuable services.

H. STAFFORD HATFIELD.

Prof. E. F. Francis

PROF. E. F. FRANCIS, who died on April 15, was a graduate of Victoria University (Liverpool) and of the University of Erlangen. He joined the staff of the Chemistry Department, University College, Bristol, in 1895, was appointed assistant professor in 1904 and became full professor in 1906. During this early period he played a very active part in the movement which led to the establishment of the University of Bristol, became a member of the first Council and impressed the mark of his personality on the institutions and organization of the new university. He was the second to fill the office of pro-vice-chancellor, which he held until his retire-

ment in 1936, and during the period 1921–22, he was acting vice-chancellor. He became very well known in the city of Bristol and was largely instrumental in promoting the cordial relations which exist between the city and the university.

When he became professor in 1906, he took over the laboratories in the old building facing University Road, with two assistants and fifty students. On his retirement in 1936 the number of students had increased to more than two hundred and the teaching staff included two professors and nine lecturers. In 1908, he was responsible for the building of a new chemistry department, and with the able assistance of Dr. F. W. Rixon he supervised the building and equipment. This Department served as a model for other chemistry departments which were constructed in the years immediately following. He had a great sense of responsibility as to the function of a university professor in the training of the characters of his students. He established a school of physical chemistry at Bristol and with typical unselfishness he encouraged its growth at the expense of his own research school. On his retirement in 1936 his friends collected £2,500 for the endowment of a Francis Francis Scholarship for the encouragement of post-graduate work in chemistry.

Francis's researches, which were carried out in spite of heavy university duties, were very largely the work of his own hands. In some forty original communications to the learned societies, he covered a wide range of subjects in organic chemistry. He was interested in the condensation products between keto-derivatives and substituted anilines, the action of nitrosyl sulphide on organic substances, the catalytic decomposition of nitroso triacetoneamine, which he employed for the estimation of hydroxyl ions, and other topics. He was especially interested in the preparation and properties of the long-chain carbon compounds. This interest first arose from his association with Prof. Sydney Young in joint publications in 1898 on the separation and oxidation of hydrocarbons. This led to a more extended research on the oxidation of paraffin wax which has aroused some attention as providing a possible means whereby waxes may be converted into fatty acids and thence to fats. In order to gain accurate knowledge of the materials composing paraffin wax, he studied the systematic building up of the longer hydrocarbon chains ranging from C_{18} to C_{46} . In the course of this work he has cleared up many obscure points in the chemistry of the natural fats and waxes. His advice was frequently sought and ungrudgingly given to other workers in this field. He set a very high standard in the purity of his products; his patience was inexhaustible, and he spared no pains in order to achieve this end. These products were employed in X-ray investigations, in measurements of heats of crystallization, dielectric constants, etc., which researches always received his enthusiastic encouragement. The standard he has set in this field of research will be difficult to surpass, although he was engaged up to within a few days of his death on an investigation which attempted to raise even his own high standards.

W. E. GARNER.