proved technique for the treatment of heart failure. In the case of digitalis, it is customary to take a day or two or longer to induce the full effects. The full dose, whatever it is estimated to be, 1 gram or 1.5 grams for a given individual, is divided into 4 or 5 fractions and given at 6- or 8-hour intervals. It is not essential to give it all at one time, since the average patient with heart failure is not *in extremis,* and little is lost by taking 2 or 3 days rather than 6 to 8 hours to induce the full effects. However, the chief reason for the divided doses is the fact that from a single full dose given at one time poisoning may result in the more susceptible individuals. Since varying susceptibility as measured by oral doses includes the factor of varying absorption, it was considered that Digitoxin (Digitaline Nativelle), which is rapidly and, for practical purposes, completely absorbed from the gastrointestinal tract, might provide a means of safe full digitalization by a single dose method. This was found to be the case. The average full digitalizing dose of 3 cat units (1.25 mg) may be given at one time to the patient with heart failure who has not recently received digitalis. It induces the full effects within a period of about 6 hours, sometimes more quickly. With this material there is provided a safe routine procedure of oral digitalization within a few hours rather than in days, as is the case with the customary technique by which digitalis is used.

Digitalis leaf or the tincture can not take the place of Digitoxin in the single dose method of digitalization. A therapeutically equivalent dose represents about 15 cat units, and this causes nausea and/or vomiting in 1 out of every 5 patients within less than two hours, due to a local irritant action, although the local emetic action of digitalis is rarely seen when the full amount is given in a series of small fractions. On the other hand, in the case of Digitoxin, a local emetic action is rarely seen even after the single full digitalizing dose, because the total glycoside for the full effects amounts to only 1.25 mg.

A sharp distinction needs to be drawn between the local and the systemic emetic action of the digitalis bodies. All the digitalis glycosides exert both types of action. We have experiments, however, with various materials such as the glycosides of squill, extracts of digitalis purpurea and of digitalis lanata, and ouabain, which indicate that it requires between 5 and 10 mg of the glycosides, sometimes more, to produce nausea and vomiting by the local action in the gastrointestinal tract. Such an action is therefore to be expected in the case of digitalis materials in which so much of the glycoside is necessary for the full therapeutic effects. It is not likely to occur with those materials of which, by reason of their high potency and completeness of absorption, smaller total amounts of glycosides suffice for full therapeutic effects.

OBITUARY

FRANZ CARL SCHMELKES

1899–1942

HIS colleagues in chemistry, his many friends in the field of medicine and his associates in the industry were shocked to learn of the death of Franz C. Schmelkes. After reiewing his last manuscript he left his office on the evening of December 11, and did not return to his desk the next morning as expected. He had succumbed to a heart attack during the night. This marked the end of a life unusually productive in the realm of science and its industrial applications.

He was born in Prague in 1899, and received his training in organic chemistry at the Carl-Ferdinand University in the same city. He obtained the degree of doctor of philosophy in 1922. For four years he worked in Hanover, Germany, at the Continental Rubber Company and in 1925 he came to the United States. Before joining the staff of the Research Laboratories of Wallace and Tiernan Company, he was associated with the Dovan Chemical Company in Newark, and the Davis Emergency Equipment Company in Hoboken, N. J. For about a decade he had been the assistant director of research of Wallace and Tiernan Products, Inc.

His first major contribution was the synthesis of N,N′-dichloroazodicarbonamidine, a chloramine which is now widely used as a disinfectant. He often referred to this chlorine compound as a "chlorine reservoir" and he felt that its success as a disinfectant is not only due to the slow release of chlorine but also to a quasi-selective action towards bacteria. He and his associates investigated its disinfecting properties extensively, and he collaborated closely with those physicians who used it clinically. His work with this disinfectant brought him in close contact with medicine; and in a short time he acquired an amazing knowledge in all branches of this science. He applied his knowledge of organic chemistry with great ingenuity to problems of therapeutics and usually attacked these problems on a broad front and on the basis of a rather general working hypothesis.

Stimulated by some evidence in the literature indicating that isosteric compounds are similar in their biological activity, he synthesized a group of isosteric compounds and investigated them pharmacologically. One of these was a thiamine analogue; another, a nicotinic acid analogue. Both compounds showed a considerable and specific vitamin activity.

In recent years he was intensely interested in the mechanism of sulfonamide action. He investigated the effect of the hydrogen ion concentration on the activity of sulfonamides *in vitro* and found an interesting correlation between the acidic dissociation constants of the sulfonamides and the effect of the pH upon their activity. The conclusion could be drawn from the data collected by him and his associates that the anionic form of sulfonamide is a great deal more active than the undissociated sulfonamide molecule and that the activity of the latter is negligible in comparison. The activity of sulfanilamide, in particular, was found to be greatly enhanced by the adjustment of the pH. The activity of sulfanilamide at the optimal pH, although not directly measured, was calculated to be greater than that of any other known sulfonamide. The practical conclusion was drawn that the local chemotherapy for wound infections should be carried out with sulfanilamide and a buffer.

He was a strong advocate of the theory that sulfonamide activity is due to the blocking of the *p*-aminobenzoic acid receptor in an enzyme system, and on the basis of this theory he and his associates synthesized various *p*-aminobenzoic acid derivatives, some of which showed a typical sulfonamide activity, that is, anti-bacterial activity which could be reversed by *p*-aminobenzoic acid. He realized the practical importance of inactivating the *p*-aminobenzoic acid which is the antagonist of sulfonamide in local chemotherapy and he worked intensely on the study of the use of N,N′-dichloroazodicarbonamidine for this purpose.

Since Pearl Harbor, he has concentrated all his efforts on the medical aspects of the war. He developed an ingenious treatment of burns, using a membrane which contains buffered sulfanilamide as a chemotherapeutic agent.

Franz Schmelkes' interest was not limited to science but embraced political, social and economic problems. He had beliefs and convictions for which he was always ready to fight. His greater interest was in his fellowmen, many of whom he helped when in need. He was a member of many scientific societies and was popular at the Chemists' Club. One of his favorite sports was golf. His guiding spirit and stimulating influence will long survive among his friends and associates who will miss him greatly.

L. REINER

RECENT DEATHS

DR. EDGAR ALLEN, professor of anatomy and head of the department at the Yale University School of Medicine, died on February 3 at the age of fifty years.

DR. EARLE RAYMOND HEDRICK, a member of the faculty of the Brown University Graduate School in Advanced Instruction and Research in Mechanics, formerly vice-president of the University of California at Los Angeles, died on February 3 at the age of sixty-six years.

DR. LEONARD MAGRUDER PASSANO, professor emeritus of mathematics of the Massachusetts Institute of Technology, died on January 30 in his seventy-seventh year.

DR. J. FRANK FRASER, consulting dermatologist at the Memorial Hospital for the Treatment of Cancer and Allied Diseases and other New York hospitals, has died at the age of seventy-two years.

MISS CAROLINE HARRISON, better known to her friends as "Carrie Harrison," died at her home in Washington, D. C., on about January 19. She entered the government service in the division of botany of the Department of Agriculture in 1887. The division later became a part of the Bureau of Plant Industry. Miss Harrison gave special attention to tannin-bearing plants. She was an enthusiastic rosarian, and was an active member of the American Rose Society up to the time of her death. She retired from government service in April, 1926.—F.A.W.

SCIENTIFIC EVENTS

THE BRITISH NEW YEAR HONORS LIST[1]

THE following names of scientific men and others associated with scientific work appear in the British New Year honors list:

Baron: Sir Charles Wilson, president of the Royal College of Physicians.

Baronet: W. M. Goodenough, chairman of the Nuffield Trust for the University Medical School, Oxford.

G.B.E.: Sir Henry Dale, lately director of the National Institute for Medical Research, president of the Royal Society.

[1] From *Nature*.

K.C.B.: Sir Wilson Jameson, chief medical officer, Ministry of Health and Board of Education.

Knights: Professor J. H. Clapham, president of the British Academy; Professor F. Clarke, professor of education, University of London; Dr. A. C. G. Egerton, professor of chemical technology, Imperial College of Science and Technology, and joint secretary of the Royal Society; Jhanendra Chandra Ghosh, director of the Indian Institute of Science, Bangalore; S. H. Howard, inspector-general of forests and president of the Forest Research Institute, Dehra Dun; Pestonji Rustom Masani, lately vice-chancellor of the University of Bombay; W. A. Stanier, chief mechan-