compounds gave identical disemicarbazenes and dioximes, and they had identical absorption curves with a maximum at 240 mμ. The compounds appeared, therefore, to be polymorphous forms of one and the same diketone, presumably containing at least one double bond. The inactive compound A was found to be a hydroxy ketone since it gave a mono-semicarbazone and a ρ nitro benzoate.

These results, therefore, were of considerable significance when we recall that pregnandiol $C_{21}H_{36}O_2$, a dialcohol, is found in the urine of pregnant women. What would be more logical than a series of compounds; progestin $-C_{21}H_{30}O_2$, a diketone with one double bond; pregnandione $-C_{21}H_{32}O_2$, a diketone, already known with no double bond; our oxyketone, $C_{21}H_{34}O_2$, and pregnandiol, $C_{21}H_{36}O_2$, all reduced products of the hormone. If so, our oxyketone should give pregnandione a known compound melting at 123°, but on oxidation it gave a diketone melting at 193°.

Once more I should like to digress and mention that at about the same time as our work on the pure substance appeared two German chemists, working independently, Dr. Butenandt and Dr. Slotta, reported the same chemical compounds. Their analyses and identification of the oxygens agreed perfectly with ours. Slotta's physiological studies of the potency of these two compounds were at variance with ours, rather seriously so. He found that full endometrial proliferation could not be obtained without the proper combination of the two different types of crystals, either form being inactive alone. Butenandt had no published data on the matter at that time. Recently, however, he has confirmed our results by showing that both crystals have the same potency. This adds very convincing evidence to the chemical evidence that the two crystalline forms are merely polymorphous modifications of one and the same substance.

I should like to show a few photographs of the two forms to show how different the same compound may appear. In general the needles are obtained when crystalizing from fairly dilute alcohol and prism when crystalizing from stronger alcohol. The melting points of these substances are also abnormal. The high melting variety on remelting will frequently melt at 120° and the low melting form will melt several degrees higher the second time. These findings do not occur regularly, however.

This about concludes the story as far as we are concerned, but I can not close without describing briefly the beautiful conclusion which Dr. Butenandt has brought to the subject by developing in the space of only a few months the structure of progestin and a method of synthesis. I mentioned above the close similarity between the empirical formula of progestin and pregnandiol. Butenandt had already worked out the detailed structure of pregnandiol. This substance was then converted by oxidation to a diketone, pregnandione, then brominated and HBr removed, the result—progestin. And curiously enough the active substance also occurred in two crystalline forms which were identical in every respect with that isolated from pigs' ovaries. An even more beautiful synthesis was carried out using stigmasterol, a wax obtained from soybeans, as a starting point. This was changed to 3-oxy bis-nor cholenic acid by the method of Fernholz and then converted to an unsaturated oxy-ketone, which we may call pregnenolon. The double bond was protected by bromination and the resulting dibrom compound oxidized to a diketone. Again when the bromine was split out progestin was obtained. These findings leave little doubt that the compound isolated from the natural source is really the hormone and further that the same active substance has been synthesized from inactive compounds of known structure. The formula must be correct, unless those for pregnandiol and stigmasterol are incorrect, something which is rather unlikely.

Surely no person a few years ago would have predicted that the hormone progestin would ever be made from such a non-human source as soy-beans.

One final question, What will the hormone be used for? Only time can tell. If it is found never to have any therapeutic value the result will have been worth the chase, for it has helped immeasurably to clarify some phases of the reproductive processes and at the same time contributed something to the chemistry of the human body.

In conclusion, I wish to take this opportunity to express my appreciation to Dr. Corner, who provided the stimulus for my early interest in the subject, and who, by his patience, has encouraged me to continue with it; and to Dr. Wintersteiner who, because of his remarkable technical skill and chemical ingenuity, helped to bring order out of chaos. I also wish to thank most gratefully the Eli Lilly and Company for their part in making the award possible and the committee which saw fit to make me the first recipient of the award.

OBITUARY

JOHN WEINZIRL

JOHN WEINZIRL, professor of bacteriology and director of the McDermott Foundation at the University of Washington, died, after a week's illness, on June 26, 1935. He was a native of Wisconsin, having been born on September 10, 1870. He was educated

at River Falls Normal School and the University of Wisconsin (B.S. 1896, M.S. 1899, Ph.D. 1906). Some years later he spent a sabbatical leave at Harvard, where he won the degree of D.P.H. (1918). He was a member of several scientific societies, holding the office of vice-president of the Society of American Bacteriologists in 1915.

While still an undergraduate he became interested in bacteriological research, his first paper (in *Zentralblatt für Bakteriologie*) on the "Rise and Fall of Bacteria in Cheddar Cheese," dating from 1897. Thus began a career of scientific production which continued uninterruptedly for nearly forty years, to be terminated only at his death.

Upon his graduation in 1896 he was married to Jacquetta Lee, of Rush City, Minnesota. Later in the summer his scientific talents were recognized by an appointment as director of research in the Agricultural Experiment Station, Geneva, New York. In the fall he returned to the University of Wisconsin for special study in preparation for his new responsibility. Then occurred an event which was destined to change the course of his life and give direction to a substantial part of his future research, for he was stricken with tuberculosis.

He went at once to New Mexico, where he regained his health, was appointed assistant professor of biology at the University of New Mexico (1897), professor of biology and chemistry (1900) and also acted as director of the Hadley Climatological Laboratory. Here he remained for nine years and engaged actively in varied investigations suggested by his environment. Typical of his publications at this period are: "The Effects of High Altitude on the Blood" and "Bacterial Flora of the Semi-desert Region of New Mexico." Here also he began his work on tuberculosis, which remained a major interest with him through the rest of his life.

In 1907 he was called to the University of Washington as assistant professor of bacteriology, was promoted to associate professor in 1909 and to professor in 1912. Here he published numerous papers in the pure science of bacteriology. He also made extensive studies in the field of his early interest, the bacteriology of foods, especially milk, meat and canned foods. When in 1924, by a gift of $100,000, the McDermott Foundation for tuberculosis research was created at the University of Washington, it seemed peculiarly appropriate that Dr. Weinzirl should be made its director. This endowment gave him more freedom for research and he, together with his collaborators, began those fundamental studies on the biology of the tubercle bacillus and the desensitization of tuberculous guinea pigs which occupied his chief attention until the end.

His scientific work must be appraised elsewhere. But it may be noted that his published papers, comprising some 45 titles, are distributed about equally among three fields: (a) the pure science of bacteriology, (b) the applied field of sanitary bacteriology and public health and (c) tuberculosis.

Professor Weinzirl was a gifted teacher whose friendly counsel and sympathetic encouragement are remembered by many a grateful student. While carrying a full teaching load, he still found time for public service, holding at the time of his death the positions of secretary of the State Tuberculosis Association, member of the State Board of Examiners for Basic Science and chairman of the Public Health Committee as technical adviser of the State Planning Council. Many of his papers on sanitary bacteriology really belong to the domain of his public service. But perhaps the most valuable contribution under this category is the course which he instituted at the university for the training of laboratory technicians in bacteriology, a work in which he was signally successful and in which he took a justifiable pride.

On the personal side Dr. Weinzirl was a man of beautiful character, sincere, genuine, unselfish. His genial and kindly spirit endeared him alike to his students and colleagues, who mourn him as a friend. By his death the university has lost a painstaking investigator and sound scholar and the state a most useful and devoted public servant.

R. M. WINGER

RECENT DEATHS

DR. BENJAMIN LINCOLN ROBINSON, emeritus professor of systematic botany at Harvard University and emeritus curator of the Gray Herbarium, died on July 27. He was seventy years old. Dr. Robinson had filled the Asa Gray professorship since 1900; he became assistant director of the Gray Herbarium in 1890 and curator in 1892.

ELBERT W. ROCKWOOD, professor of chemistry, formerly head of the department of chemistry at the University of Iowa, died on July 17 at the age of seventy-five years.

DR. JAMES M. VAN HOOK, professor of botany at Indiana University, died on June 21. He was sixty-five years of age.

DR. LEWIS FUSSELL, a member of the faculty of Swarthmore College for nearly thirty years and professor of electrical engineering since 1920, died suddenly on July 15 at the age of fifty-three years.

DR. HENRY ROBBINS BARROWS, associate professor of education at the New York University School of Education and author of text-books on biology, died on July 16. He was fifty-five years old.