of the plant and the plant type. In the case of wheat, rainfall may remove as much as 85 percent of the applied isotope. In all cases, the higher percentage of applied strontium-90 was found to be associated with the leaves and stems of the plant.

Prout (*17*) has indicated the effect of *p*H and concentration on the ion-exchange capacity of a particular soil for strontium. Absorption reached a maximum at *p*H 7.0 and at lower concentrations of strontium. He has also indicated a decrease in absorptive capacity with increase in salt concentration. We had pointed out previously (*18*) the inverse of this reaction—that is, the desorption of strontium from tuff and soils by various salt solutions.

Nishita *et al.* (*11*), in an excellent study, have shown a utilization of non-exchangeable potassium by Ladino clover. They also point out that, as exchangeable potassium decreases in the soil, the amount of cesium-137 fixed by the soil increases. Evidence is presented for increased cesium-137 uptake as exchangeable soil potassium decreases due to continued cropping.

Romney *et al.* (*10*) have shown that stable strontium releases strontium-90 to the soil solution so that strontium-90 becomes more available to the plant up to applications of about 5 tons of strontium per acre. No practical dilution effect of strontium-90 by stable strontium was shown.

Romney *et al.* (*8*) have studied the uptake of strontium-90 and four other radioisotopes by five different plants from seven different soils. Strontium-90 was very significantly taken up by all plants. Both plant and soil effects were noted. These authors also point out an inverse relationship between strontium-90 in the plant and available calcium in the soil.

Klechkovsky (*5*) has reviewed extensively the work on behavior of fission products in soil in the U.S.S.R. He also points out the lack of cesium-137 uptake from soil by plants and notes an inverse relationship between concentrations of calcium in soil and of strontium-90 in plants. Of interest is his report of marked increase in the uptake of cesium-137 when plants are grown hydroponically. These results further indicate nonavailability of soil cesium and are attributed to the strong bond between cesium and the soil colloid.

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Gilbert Morgan Smith, Botanist

Unlike many scientists, Gilbert Morgan Smith, who was born in Beloit, Wisconsin, 6 January 1885, gave no indication of his future occupation in his boyhood hobbies and activities. Indeed, despite the fact that he came from an academic family—his father, Erastus Gilbert Smith, was professor of chemistry at Beloit College—Gilbert's career as a scholar began inauspiciously. He had difficulty with his studies (particularly the classics), and his pranks at Beloit High School were far more memorable than his academic record. Many of the present generation of botanists who were brought up on the two volumes of the scholarly *Cryptogamic Botany* will be shocked to learn that its author was almost expelled from high school for putting asafetida in the heating ducts. Through the influence of his father, he was accepted at Williston Academy, where the perceptive headmaster soon discovered his aptitude for science. From that time on, his progress was so rapid that his undergraduate record qualified him for election to Phi Beta Kappa when a chapter was established at Beloit.

After graduating from Beloit College in 1907, he taught science in high school in Stoughton, Wis., for a year before he began graduate study at the University of Wisconsin. He had intended to become a chemist, but while preparing for language examinations he became so fascinated with the algae that he decided to work in botany under C. E. Allen. He obtained his Ph.D. in 1913 and was married that same year to Helen Pfuderer, who shared his career from that time on. He remained on the staff at Wisconsin and moved steadily upward in academic rank. In 1923 he was invited to Stanford University for the autumn quarter, and two years later he succeeded Douglas Houghton Campbell as professor of botany at Stanford. He became emeritus professor of biology (botany) in 1950 but remained active scientifically until he died, on 11 July 1959.

Smith was accorded many honors. He was elected to the National Academy, the American Academy, Phi Beta Kappa, Beta Theta Pi, and Sigma Xi. Beloit College recognized his ability

Gilbert Morgan Smith (left) and Professor F. E. Fritsch, Stockholm, 1950.

relatively early by awarding him an honorary D.Sc. in 1927. Although he scorned the biological "politician," his ability and reputation were such that he was elected to office in a number of scientific societies. He served as president of the Botanical Society of America, the American Microscopical Society, the Phycological Society of America, and section G of the AAAS.

Although Smith considered himself to be a morphologist, he contributed to many phases of phycology. His interests developed in a logical sequence, from the detailed cytological and developmental studies which formed the basis of his doctoral thesis, to the extensive surveys of the phytoplankton of the lakes of Wisconsin and other regions, to the studies of marine algae after his move to California, and finally to his physiological studies on sexual reproduction in *Chlamydomonas*. In the years immediately preceding his death he demonstrated that sexual reproduction in this small green alga is coordinated by at least two substances—one that is heat-labile and extracellular and one that is intracellular. It is most unfortunate that he was unable to bring these studies to completion for publication, but his notebooks describing his experiments will be on file at Stanford, together with his outstanding collection of reprints on algae, which his wife has given the library.

Smith's books were a logical outgrowth of his research and teaching. His participation in the elementary botany course at Wisconsin made logical his leadership in the writing of *A Textbook of General Botany,* which has gone through five editions and numerous printings. His *Fresh-water Algae of the United States,* a comprehensive and useful manual which met with acclaim on both sides of the Atlantic, was a natural outgrowth of his familiarity with fresh-water algae, gained through his surveys of phytoplankton. The *Marine Algae of the Monterey Peninsula* was based on his years of teaching a summer course at the Hopkins Marine Station. Finally, his best-known work, *Cryptogamic Botany,* was a summation of his experience with both fresh-water and marine algae and of that gained from teaching the courses in mosses and ferns which he inherited from his predecessor.

Smith's success as an author must be attributed in large part to the clarity of his thinking. He thought in paragraphs. When he was writing he pecked out manuscript steadily on his portable typewriter. He did his library work in advance and kept meticulous running files on various topics, so that he seldom paused to look up material. His writing style was straightforward; he wasted no time casting about for elegant words or colorful expressions. His illustrations were drawn in the same forthright manner.

The same careful preparation and clarity of expression which characterized Smith's writing made him an excellent lecturer. He lectured slowly but without repetition, and in advanced courses he covered a great deal of material. In elementary courses, he believed in simplification by omitting topics rather than by diluting them. "The most important thing in teaching an elementary course," he used to say jokingly, "is learning to suppress the truth." In his advanced courses he suppressed very little. He did not indulge in the stereotyped classroom joke which is designed to elicit uproarious laughter from a captive audience, but his lectures were laced with a subtle humor—"the chloroplast of *Chlamydomonas* is shaped like a cup—a cup in a drive-in restaurant, because the bottom is very thick," or "the zoospore of *Oedogonium* is like toast—it always lands buttered side down." On occasion he could be dramatic, as when he bolted from the classroom shouting "follow me" over his shoulder. The bewildered class followed him through corridors and passageways to a laboratory which had Venetian blinds. Smith seized the controls, and working them back and forth vigorously, said, "See, incubous . . . succubous . . . incubous . . . succubous." At least one class should remember these vexing adjectives, which describe the arrangement of liverwort "leaves."

Perhaps one of Smith's outstanding characteristics was his extraordinary self-discipline. It was this—in addition to his efficiency and energy—that made his great output possible. After the early days at Wisconsin, his routine followed an invariable pattern. He arrived at his office shortly after 8:00 and wrote or made observations steadily until about 10:30, when he took a short break (about long enough to smoke half a cigarette), during which he stretched his legs or talked with colleagues. He then worked steadily until noon, ate lunch, and returned to work until about 3:30, when he took another break; after this he worked on until about 5:30. On Wednesday afternoons he played golf. He never took work home, and he never returned to the laboratory in the evening. In the evening, he engaged in an active social life. From 8:00 to 5:00 he was a dedicated scientist whose manner was such as to discourage the garrulous; from 5:00 to 8:00 he was an excellent bridge player, an accomplished dancer, and a gifted conversationalist. His colleagues at the University rarely saw him at play; the

friends whom he knew socially had little idea of his prominence as a scientist.

Smith resembled his predecessor, D. H. Campbell, in his love of travel. From the North Cape in 1920 to Indonesia in 1956, he and his wife covered most of the globe, with the exception of the interior of Asia, the eastern Mediterranean, and Antarctica. His reputation and his wide correspondence made him a welcome visitor to botanical laboratories everywhere.

As his health deteriorated during the last two years, Smith's courage was an inspiration. For one accustomed to relying on himself, physical weakness must have been more difficult to bear than pain, yet he continued to come to his laboratory despite the great effort involved, and during his last days, when he was able to speak only with difficulty, he continued to direct the activities of his assistant from his hospital bed. The passing of such a man leaves a void that can never be filled by a research team.

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Science in the News

Permanent Space Committee Established by United Nations

The United Nations General Assembly approved on 12 December the establishment of a permanent Committee for International Cooperation in the Peaceful Uses of Outer Space. The new committee was set up as the result of a resolution passed earlier in the day by the U.N. Political Committee. The vote was 74 to 0; the Dominican Republic abstained, and seven members of the committee were absent.

Functions Described

The Political Committee proposal to the General Assembly stated that the space committee's responsibilities would be to:

"(A) Revise, as appropriate, the area of international cooperation, and study practical and feasible means for giving effect to programs in the peaceful uses of outer space which could appropriately be undertaken under United Nations auspices, including *inter alia*: (i) assistance for continuation on a permanent basis of the outer space research carried on within the framework of the International Geophysical Year; (ii) organization of the mutual exchange and dissemination of information on outer space research; and (iii) encouragement of national research programs for the study of outer space, and the rendering of all possible assistance and help towards their realization.

"(B) Study the nature of legal problems which may arise from exploration of outer space."

The permanent body will not take up the regulation of the military uses of outer space. Neither the United States nor the Soviet Union is willing to have it do so.

Membership Balance Controversial

The East-West balance of membership on the committee has long been a controversial issue. A temporary space committee was established a year ago, but it could not be effective because it was boycotted by the Soviet Union. The temporary body had 12 Western members, three neutral (Sweden, India, and the United Arab Republic), and three members of the Soviet bloc (the U.S.S.R., Poland, and Czechoslovakia). Two of the neutral members, India and the United Arab Republic, refused to participate in committee activities last spring because of the Soviet boycott.

During the negotiations in recent weeks several of the Western delegates indicated that their governments would not agree to more than five seats for the Soviet bloc on the permanent committee. They held that even this number was too many, since it was disproportionate to the strength of the Soviet bloc in the United Nations. The Soviet bloc has nine members out of 82.

The new 24-member space committee is composed of 12 countries that are members of joint defense agreements against possible Soviet aggression, seven members of the Soviet bloc, and five neutral countries. The members follow: Albania, Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, Czechoslovakia, France, Hungary, India, Iran, Italy, Japan, Lebanon, Mexico, Poland, Romania, Sweden, the U.S.S.R., the United Arab Republic, the United Kingdom, and the United States.

The Political Committee's space proposals to the General Assembly included a resolution calling for an international conference in 1960 or 1961 "for the exchange of experience in the peaceful uses of outer space." Participation is limited to members of the United Nations and its specialized agencies.

The U.N. does not plan to establish any new permanent agency to administer the outer-space program, as it did for atoms-for-peace. Instead, the program will operate through COSPAR, a body that was set up in October 1958 within the framework of the International Council of Scientific Unions to continue the cooperation and exchange of data in space research that had developed during the International Geophysical Year. The national adherents to COSPAR are scientific academies, not governments.

Geological Survey Volcanologists Study New Series of Eruptions at Hawaii's Kilauea

New eruptions of the volcano Kilauea in Hawaii are being studied by the staff of the U.S. Geological Survey's Hawaiian Volcano Observatory, which is located in Hawaii National Park on the rim of Kilauea. Surface activity thus far has been limited to a portion of the crater called Kilauea Iki or "Little Kilauea." Between 14 November and 5 December Iki erupted five times, its lava fountain rising to a height of 1650 feet or more and dying abruptly after