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DISTINGUISHED MEMBER AWARD

Dr. Sturges W. Bailey and Dr. José J. Fripiat received the Distinguished Member Award of The Clay Minerals Society at the 1975 Clay Minerals Conference held in conjunction with the International Clay Conference in Mexico City, Mexico, on July 21, 1975. The following citations were read on behalf of the recipients by Haydn H. Murray and George W. Brindley, respectively:



INTRODUCTION OF STURGES W. BAILEY

Haydn H. Murray

Mr. President, members, and guests of The Clay Minerals Society, I am honored to present Dr. Sturges W. Bailey, better known to his associates as "Bull," as the recipient of a distinguished membership in The Clay Minerals Society. Dr. Bailey was born in 1919 in Waupaca, Wisconsin. Because Dr. Bailey comes from the North Woods, he was given the nickname "Bull" where the phrase "Bull of the Woods" is associated with the Paul Bunyon stories. The nickname is very appropriate because the feats of Paul Bunyon and the Blue Ox are legendary, as are the feats of S. W. Bailey in the field of mineralogy and X-ray crystallography.

Dr. Bailey attended the University of Wisconsin and received his A.B. degree in geology in 1941. He was elected to Phi Beta Kappa signifying his outstanding scholastic achievements. From 1942 to 1946 he served as photo interpreter in the Pacific theater with the United States Navy. He returned to Wisconsin after his naval service and received the A.M. degree in geology in 1948. While working on his master's degree, Dr. Bailey was given the responsibility for the X-ray diffraction unit in the geology department. He became very interested in X-ray crystallography, and in 1948, Dr. R. C. Emmons, who was chairman of the Department of Geology at Wisconsin, along with Dr. Eugene Cameron talked Dr. Bailey into going on for a Ph.D. in X-ray crystallography. They told him if he would go elsewhere for the Ph.D. in X-ray crystallography, they would give him a position on the Wisconsin faculty when he finished. He applied for a Fulbright grant and was awarded a Fulbright scholarship from 1949 to 1951. He went to Cambridge, England, where he studied and received his Ph.D. under tutelage of Professors W. L. Bragg and W. H. Taylor. Before leaving for England, he married Marilyn Jones. They have two children, David and Linda, both now attending the University of Wisconsin.

Dr. Bailey joined the faculty of Wisconsin in 1951 and became a full professor at Wisconsin in 1961. From 1968 to 1971 he was chairman of the Department of Geology and Geophysics. Dr. Bailey has distinguished himself as an outstanding scholar and also as an outstanding administrator and teacher. He was cochairman of the Milwaukee meeting of the Geological Society of America in 1970.

Dr. Bailey has received many honors and awards. He is a fellow of the Geological Society of America, a fellow of the Mineralogical Society of America, was a council member of MSA from 1970 to 1972, Vice-President in 1972–1973, and President in 1973–1974. His presidential address was "Cation Ordering and Pseudosymmetry in Layer Silicates." He was an Associate Editor of the Journal of Sedimentary Petrology and is a member of the Society of Economic Paleontologists and Mineralogists. He was Editor of The Clay Minerals Society's publication, *Clays and Clay Minerals* from 1964 to 1969. He was Vice-President of The Clay Minerals Society in 1970–1971 and President in 1971–1972. At present he is editor of the AIPEA proceedings volume which will be published subsequent to the Mexico City meeting. He is chairman of the Joint Nomenclature Committee for the International Minerals Association and the International Union of Crystallography. Dr. Bailey's reknown is in the field of X-ray crystallography where he has specialized in the structure of the feldspars and the layer silicates.

In addition to his many scientific contributions and his scholarly attainments, "Bull" Bailey is a genuine, patient, kind, and thoughtful individual who is exceptionally well liked by his associates and students—a true measure of this "Bull of the Woods." Mr. President, it is a great pleasure to present to you, as one of the two 1975 distinguished members being honored this year, Dr. Sturges W. Bailey, who joins a very select group of distinguished members.

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INTRODUCTION OF JOSÉ J. FRIPIAT

George W. Brindley

Mr. President, members, and guests of The Clay Minerals Society, it is a special pleasure and privilege to present Professor J. J. Fripiat as the recipient of a distinguished membership in The Clay Minerals Society.

José J. Fripiat was born in Namur, Belgium, July 1, 1923. He took the equivalent of a bachelor's degree in physical chemistry in the University of Louvain in 1945 and the Doctorat en Sciences with highest distinction in 1949, also in Louvain. He is the author or coauthor of almost 200 publications, including several books, and still has many active years ahead. His claim to distinction rests not only on the number and importance of his publications, but also on his role as a teacher and the inspiration he has given to many who have been associated with him.

Following a year in the United States in 1950 with a Marshall scholarship, spent with Debye in Cornell and Hendricks in Washington, D.C., Dr. Fripiat was appointed in 1951 "chargé de cours" (assistant professor) in the University of Louvain. In 1959, at the relatively early age of 36, he became full professor and director of the Laboratoire de Physico-Chimie Minérale. His rapidly growing research activities and the number of his students and associates called for a new laboratory on the outskirts of Louvain, in the Institut des Sciences de la Terre.

Dr. Fripiat's interests over the years have been concerned particularly with clay minerals and zeolites, their synthesis, their surface reactions, and especially their properties as catalysts. He has had associated with him a great many enthusiastic assistants whom he has encouraged to become experts in particular experimental techniques while at the same time participating in more general programs. It is significant that many of the publications carrying Dr. Fripiat's name are joint publications with three, four, and occasionally even five names. It is a characteristic of much of his work that he has tackled problems on a broad front. In many ways, the strength of his laboratory in Louvain rested on the active and willing cooperation of its members. Visitors to his laboratory were soon involved in round-table seminars where ideas passed freely to and fro, and new concepts were developed.

This happy and productive situation continued for a decade or more until, in the early 1970s, the University of Louvain, now a complex of 35,000 or more students, was subdivided into a Flemish-speaking section, which remained in Louvain itself, and a French-speaking section, which was developed on a new campus at Louvain la Neuve, about 25 km distant. Dr. Fripiat's laboratory was destined to be transplanted to the new campus.

In 1972, Dr. Fripiat was appointed professor in the University of Illinois with a particular task of developing a laboratory of surface chemistry. However, this did not become a permanent arrangement, and in 1974 he was appointed director of the C.N.R.S. Centre de Recherche sur les Solides à Organization Cristalline Imparfaite, at Orléans, France, the position occupied previously by Jacques Mering who also was a member of our society.

Any attempt to give a short review of the contributions of Dr. Fripiat and his associates to the study of clays, silicates, and amorphous materials can only be very inadequate. Nevertheless, I must make some attempt to sketch in bold outline, and with a flagrant disregard to details and the names of collaborators, the main lines of his work. His first published paper, "The Relationship between the Force Constant of the Molecular Potential Energy Function and the Polarizability of the Constituent Atoms" appeared when he was barely 21 years old. This, and several subsequent papers on related topics, foreshadowed his subsequent interest in the application of spectroscopic, particularly infrared, techniques to mineral problems. For a short period, he worked at the Institute for Studies in Agronomy, at Yangambi, in what was then the Belgian Congo. From this work came a number of papers relating to soil clays and soil classification, which we can now see as a prelude to his main scientific endeavor.

The period 1960–1970 was one of extraordinary activity. Dehydration of montmorillonite and vermiculite, and dehydroxylation of kaolinite, chrysotile, boehmite, and micas were studied by kinetic methods, X-ray diffraction, infrared spectroscopy, and other techniques. The recognition that protons may become delocalized prior to their loss by dehydroxylation was an important result of these investigations.

From studies of the transformation of kaolinite to metakaolin, it was only a short step in principle, but a difficult one in practice, to examine the structures and properties of silica gels and amorphous silico-aluminas. The surface properties of these materials are of great importance in their use as catalysts. These experiments, in which half a dozen or more of his associates

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participated, were characterized by an unusual breadth of approach involving radial Fourier analysis of electron density distributions, infrared analysis, X-ray fluorescence data, surface area, cation exchange, and ammonia-absorption measurements, and observations on the cracking of cumene as a test of catalytic action.

In this same period, studies of clay-organic interactions, involving mainly nitrogen compounds and H-, Na-, and Ca-montmorillonite were undertaken. Experiments on the interaction of ammonia with montmorillonite and its protonation by reaction with the hydrogen of H-montmorillonite or with hydrogen feebly held by residual water molecules led the way to more complex investigations of the absorption of short chain amines, amino acids, and proteins. Again, X-ray and infrared methods were combined with chemical methods to analyze the processes taking place. Since 1968 he has devoted much time to the application of nuclear magnetic resonance to structural and dynamic studies of surface phases. It is relevant to remark that only a few weeks ago Dr. Fripiat contributed a paper on "Clays as Catalysts for Prebiotic Synthesis" to a symposium on the role of clays in abiotic synthesis and the origin of life.

Time does not allow me to elaborate other areas of work, yet I must mention a variety of experiments on the low-temperature synthesis of clay minerals and of zeolites, the polymerization of Al-hydroxy complexes in water, the existence of quasi-crystalline structure in water-amine mixtures, the formation of iron alkoxide from glycerol and iron oxide, and, most recently, cooperative phenomena in very small metal particles.

Three books carry the name of Fripiat: J. J. Fripiat and M. C. Gastuche, *Etude Physio-Chimique des Surfaces des Argiles* (1952), 62 pp., published by INEAC (Brussels); J. J. Fripiat, J. Chaussidon, and A. Jelli, *Chimie-physique des phénomènes de Surface* (1971), 387 pp., published by Masson et Cie. (Paris); and a monograph to be published by the Mineralogical Society, London, with Dr. Fripiat as editor.

Professor Fripiat was elected to membership of the Royal Academy of Belgium in 1968. He received the silver medal of the French Society of Pedology in 1964, and became Associate Member of the French Academy of Agriculture in 1967. Also in 1967 he received the Franqui award, which is the highest Belgian scientific honor and is awarded every 3 years by an independent jury of eminent scientists outside Belgium. He is an Honorary Counselor of the Council for Scientific Research (C.S.I.C.) in Spain, and he became President of A.I.P.E.A. in 1973. Also in 1973 he was elected "National Lecturer" by the U.S. Catalysis Society and was invited to lecture to nine of the major centers for catalysis research in the USA.

In conclusion, Mr. President, I am sure there are many omissions from this presentation, but I hope I have included enough to justify the election of Dr. J. J. Fripiat to the rank of Distinguished Member of our Society, and it is with much pleasure that I present him to you.

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