Nguyen Phuc Buu-Hoi
1915–1972
IN MEMORY OF
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The body of Prince Buu-Hoi lay in state for five days in the small sanctuary at Rue Gassendi in Paris, following his death from a heart attack on January 28, 1972. Numerous among those who passed his bier were fellow Vietnamese, coming to pay their last respects to one of royal descent who worked quietly but with courage and perseverance to establish peace and improve health and economic conditions in his divided native country. These undertakings alone were sufficient to assure him of a place of honor in the hearts of many. But over and above these endeavors, Professor Buu-Hoi had dedicated his life to science. His death robbed French science of one of its most illustrious figures and the international cancer research community of its most original and productive member exploring the structure-activity relationships of polynuclear carcinogens. But it would be unfair to his genius not to say right away that his interest went far beyond chemical carcinogenesis, as he published abundantly also in organic chemistry, pharmacology, therapeutics and epidemiology, and physico- and biochemistry, fields not directly related to the problem of cancer. This incredible productivity is best illustrated by the bare statistic that the total number of his publications is close to 1100. With the passing of Buu-Hoi and of Antoine Lacassagne, his senior partner who preceded him in death by only a few weeks, a heroic and important chapter of the study of carcinogenesis comes to a close.

But besides this loss for science, the students and friends of Buu-Hoi mourn a colorful and extraordinary man whom they loved. For those who remember his unassuming friendliness and kindness, he leaves the image of a man with great serenity, goodness, and inner peace. For those who remember the warmth of his boyish smile—suddenly illuminating his serious, slightly sad face—and the intellectual sparks of ideas, new plans and interpretations which began to burst forth when his imagination was fired, he left the impression that the deepest sources of intuitive insight were somehow freely open to him. Beneath the scientific and political renown and prestige he attained and above these endeavors, Professor Buu-Hoi had dedicated his life to science. His death robbed French science of one of its most original and productive members.

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Carcinogens made him acutely aware of the importance of subatomic particles and conscious of the peculiar structural pattern of polynuclear compounds. So Lacassagne's mind was unusual those days—proposing to explain carcinogenesis by a very different backgrounds—must have been instantaneous, and of the great intellectual fascination of such studies.

At their first meeting in 1944, the rapport between the 60 year old Lacassagne and the 29 year old Buu-Hoi—despite their very different backgrounds—must have been instantaneous, since they began publishing together immediately. However, Buu-Hoi did not formally join the Radium Institute until 1947 when he became head of the newly established Department of Organic and Medicinal Chemistry and "Maitre de Recherches" at the CNRS. After thirteen highly productive years, Buu-Hoi and his group moved in 1960 from the Radium Institute to more spacious quarters at the Institute of Chemistry of Natural Substances located in the National Center of Scientific Research laboratory group at Gif-sur-Yvette, about 15 miles from Paris. In 1962, he reached the top of the CNRS-supported research hierarchy with his promotion to Director of Research ("Exceptional" class). Around 1967, Buu-Hoi established research groups, one in Orléans-La Source at the Marcel-Delépine Center and a second at the Lannelongue Institute at Vanves, at the southern edge of Paris.

The scientific accomplishments of Buu-Hoi are immense. Although an organic chemist by training and of world-wide renown, he had the intuitive intelligence coupled with a vast memory which enabled him to grasp the essentials of a biological problem sometimes only distantly related to organic chemistry. It is in his laboratory at the École Polytechnique that he truly began his research career with investigations on chaumoorgic and hydncarptic acids, which were then the only products used for the treatment of leprosy. In a few years, he established himself as an international authority on the chemotherapy of leprosy. He delineated the role of the cyclopentene ring, of the double bond thereof, and of the chain length, in the toxicity and leprostatic activity of these compounds. Although from the time of his 1944 meeting with Lacassagne, Buu-Hoi's main preoccupation was chemical carcinogenesis, he continued to devote substantial effort to the chemotherapy of leprosy and, associated with it, the chemotherapy of tuberculosis.

The overwhelming mass of his contributions are, however, in the field of chemical carcinogenesis and synthetic organic chemistry related to it. In the 1940's and early 1950's, he collaborated extensively with the quantum chemists of the Radium Institute on various aspects of the "electronic theory" of carcinogenesis. He was the first to propose the involvement of noncovalent forces. Together with Lacassagne and Rudali, he was the first to describe, in the early 1940's, the phenomena of antagonism and synergism between carcinogens using hydrocarbons on the mouse skin; in later years, these studies were extended to hepatic and other carcinogens. Beginning about 1947, he undertook, in collaboration with Lacassagne and Zajdela, an exploration, on a totally unparalleled scale and depth, of the relationships between structure and carcinogenic activity of polynuclear compounds. This involved the fundamental ring systems and derivatives of 1,2-benzanthracene, the stearanthenes, the dibenzopyrenes, anthanthrene, 1,2,3,4-dibenzanthracene, a great variety of benzo- and dibenzo-fluoranthenes and large-molecular-size and "hypercondensed" hydrocarbons, as well as the role of ring opening and partial hydrogenation. Study with the dibenzopyrenes led him to the discovery of a fascinating molecular rearrangement involving the entire framework of aromatic hydrocarbons. His studies with the carcinogenic azulenophenalenes led him to question the role of aromativity. Besides his monumental studies with aza-replaced hydrocarbons, benz- and dibenzacridines and -carbazoles, a number of entirely new structural types of heteroaromatics—with special reference to the nature, number, and position of the heteroatoms—were synthesized and tested. These were benz-o- and naphtho-derivatives of pyridobenzobol and β-carboline, heteroaromatics with sulfur, selenium or arsenic replacements, alone or in association with nitrogen, including nitrogen- and sulfur-containing pseudoazulenes. With the intent of establishing a connecting link between the polynuclear aromatics and the aflatoxins a series of hydrocarbon-like polynuclear lactones were explored. The studies with the heteroaromatic polynuclears led him to propose a "newer picture" of a carcinogenic hydrocarbon, widening considerably the generality of the classical K-region hypothesis.

This enumeration of his accomplishments would not be balanced without mentioning his contribution to studies on the carcinogenicity of 4-nitroquinoline-N-oxide derivatives, on the production of plant rumors by a nitrosamine, on the metabolism and protein binding of polynuclears and effect of the latter on DNA replication and transcription, on the effect of various carcinogens on the hatching of shrimp eggs, etc. Beginning the mid 1960's, Buu-Hoi focused his interest increasingly on the structural facets of polynuclears which govern their ability to induce microsomal enzyme synthesis involving, in particular, zoxazolamine and dicumarol hydroxylation. Besides, chemical carcinogenesis, fundamental organic chemistry, and the chemotherapy of leprosy and tuberculosis, Buu-Hoi and his associates carried out investigations on a wide range of problems of therapeutic and biological interest, for example, the synthesis and testing of anti-inflammatory non-steroid compounds, substituted sex hormones, antidiabetic agents, anti-coagulant substances and their potentiation, treatment of hypertension by methyl-DOPA, antioxidants and the chemophrophylaxy of aging, odor and chemical constitution, the toxicity of dioxine—to name but some.

Many honors and awards recognized Buu-Hoi's accomplishments. He was several times laureate of the French Academy of Sciences, the French Academy of Medicine, and the French Ministry of Education. He received awards from
the Academy of Sciences of The Netherlands, the French League Against Cancer, and the French National Institute of Health and Medical Research; the U.S. National Cancer Institute has provided financial support for his work for a number of years. Buu-Hoi was a member of the Panel of Experts for Leprosy of the World Health Organization and an honorary member of several medical societies. He was made Commander of the "Legion of Honor," of the "Order of Public Health," of the "Order of Research and Invention," and a "Knight of the Academic Palms."

Nguyen Phuc Buu-Hoi was probably the most prestigious intellectual that Vietnam has produced since the French conquest of the country about 100 years ago—a somewhat legendary personage to many of his countrymen. Both Vietnams vied for him. North Vietnam's President Ho Chi Minh, named him in 1947 Rector of the University of Hanoi. He acted as a science advisor to South Vietnam's President Ngo Dinh Diem, who appointed him in 1960 Director of the Atomic Energy Establishment of Vietnam. In this capacity, he became a Member of the Board of Governors of the International Atomic Energy Agency. He was instrumental in the establishment of an Atomic Energy Research Center—geared toward the medical and agricultural uses of atomic energy—including a nuclear reactor in Dalat in 1963. He represented the Republic of South Vietnam as an ambassador-at-large to several African countries and to the United Nations in 1963. An indicator of the success of Buu-Hoi and the group of young diplomats led by him to improve South Vietnam's diplomatic standing—until President Diem's death—is the honorary distinctions bestowed upon him by several countries of the Third World. He participated in negotiations and missions to establish peace.

The passing of Buu-Hoi leaves a void difficult to fill. He pioneered in several scientific fields and left an imprint on a number of others. His soaring intellect survives in the unparalleled span of his contributions; his kind and generous character will always be remembered by his many students and friends.

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