



**JOHN NYE**

John Frederick Nye was born in Hove, Sussex, in 1923, son of a chartered surveyor. He went to school in Hove and in 1936 won a scholarship to Stowe School. In 1941 he went to King's College, Cambridge, as a major scholar in Mathematics and Physics, and read for Part I of the Mathematics Tripos and Part II of the Natural Sciences Tripos (Physics), graduating in 1944. From then until 1951, he did research at the Cavendish Laboratory under Sir Lawrence Bragg and Dr. E. Orowan on the physics of metals and transparent crystals, getting his Ph.D. in 1948.

Nye worked on the plastic deformation of crystals, particularly on the development of an idea of Orowan's for using the photoelastic effect in silver chloride crystals to study under the microscope the internal stresses produced by plastic deformation. The results were interpreted according to the hypothetical concept of dislocations existing at that time (G. I. Taylor and E. Orowan). He also helped to develop Sir Lawrence Bragg's "bubble model" of a crystal, a model which he feels has helped in teaching about dislocations. He taught in the Department of Mineralogy and Petrology and helped with the crystal physics course in the Physics Department, proving to be an excellent teacher with a flair for explaining difficult ideas. It was his teaching which eventually led to the writing of "Physical properties of crystals. Their

representation by tensors and matrices" (Oxford University Press, 1957), which represented a marked advance over any other book then available and which is a leading text on this subject.

The Cavendish Laboratory was very crowded during this period. Nye shared a room with Orowan, who was consulted on several occasions by W. V. Lewis, lecturer in geomorphology in the Geography Department, about the problems of the mechanics of cirque glaciers, which at that time were not understood quantitatively, and about other problems of ice mechanics. Out of the conversations arose Orowan's celebrated short contribution to the joint meeting of the British Glaciological Society, the British Rheologists' Club and the Institute of Metals, in April 1948. Nye, who had listened with interest to the exchange of ideas between Lewis and Orowan, was asked by "Nature" to report the meeting. This was the beginning of his serious thinking in glaciology. It was fortunate that in Cambridge at this time other glaciological activities were afoot. Max Perutz, of the Cavendish Laboratory, was busy with his pipe experiment on the Jungfrauoch, and this was a stimulus to theoretical thinking on ice mechanics. Vaughan Lewis's group of research students were working on glacier problems in the Alps and Norway, and Lewis and Orowan arranged for John Nye and John Glen, at that time a research student in the Cavendish, to



have their first taste of exploring and studying Alpine glaciers. Lewis, with his irresistible Welsh enthusiasm and powers of persuasion, invited Nye to see John McCall's tunnel into Vesleskautbreen, in the Jotunheimen, Norway.

1952 was a milestone in Nye's life, for it was then that he spent a year at the Bell Telephone Laboratories, New Jersey, U.S.A., working under Dr. W. Shockley. He was the only member of the research group not working on transistors, which Shockley and two other scientists had just invented. He met in New York his charming wife, Georgiana, who was a dancer specialising in modern dance. Although he stayed only one year in the U.S.A. at the time, he has returned frequently since, for professional and family visits.

On his return to England in 1953, the Nyes went to live in Bristol, where John had been appointed Lecturer in the Physics Department of the University. He became Reader in Physics in 1965. His contributions in solid state physics have been principally in the field of dislocation theory, where he has made significant contributions both to the experimental study of the stress fields round dislocations by his observations on the stress birefringence in transparent plastically deformed crystals, and also to the theory of dislocation density. His work in crystal physics was more of a surveying nature, in preparation for his text book.

In 1959 he was at the California Institute of Technology from October to December, as Visiting Professor in Glaciology, and in 1964 he was the General Electric Foundation Visiting Professor of Applied Science at Yale University and Visiting Geophysicist at the Institute of Geophysics and Planetary Physics, University of California at Los Angeles. During the 1959 visit, Professor R. P. Sharp took him to see the glaciological work on the glaciers of the Pacific Northwest, British Columbia and Alaska, a tour which further stimulated his interest in glaciology, and which expanded work he had been concerned with in Norway.

The Cambridge expeditions to Austerdalsbreen arose largely from the enthusiasms of Vaughan Lewis, who gathered around him a group of scientists and willing students and

friends, and took them to the glacier in successive summers during the 1950's. Nye went with them in 1955, '56, '57, '58 and '59, and also in 1963. It was these expeditions that led to happy collaboration with friends such as Bill Ward and John Glen who were themselves making valuable contributions to glaciology. This practical experience of glaciers enabled him to test theories of glacier mechanics. He is recognized in international circles as one of the leading glacier theorists today, and has produced a series of important contributions. He has successfully applied the ideal plastic approximation to glacier flow and has shown how to modify this in the direction of more realistic mechanical models. More recently he has shown how a very general kinematic model may be used to deduce results of great interest in terms of deducing past changes of glacier budget from observations of glacier length.

Nye has also made valuable contributions in glaciology by taking part in the deliberations of the Commission of Snow and Ice and the Council of the Glaciological Society, of which he is now President. He has been at pains to make sure that the work of other glaciologists is directed along lines that are important to the development of the subject.

His friends refute his claim to be a theoretical man who is no good at practical things. He is a valuable member of a field team, designing and analyzing the experiments; he has a keen sense of humour and is a delightful and instructive field companion, as the many students and friends who camped and worked with him in the wild seclusion of Austerdal will recall. His wife was as valuable a member of the team, and much of the success and happiness of the expeditions was due to her lively, sympathetic and practical organization. His practical prowess and his wife's good taste have also created a home of great charm for themselves and their three children. Visitors are liable to be drawn into discussions on house-fixing problems, on gardening, on painting—his grandfather was a landscape painter and John has inherited some of his talent—and on music. If he is fortunate, the visitor may even hear the family ensemble play recorder music.