

obituary

Ove Frydenberg, known for his work in experimental population genetics of *Drosophila* and, in recent years, of protein variation in fishes, died in Denmark on April 7, at the age of 45.

After studying genetics and biometry at the University of Copenhagen, where he earned his Magister degree in 1955, he joined the staff of the Genetics Department there and lectured on population genetics and evolution. He also lectured on human genetics at the Dental School and served as consultant and collaborator for the barley genetics research group of the Danish Atomic Energy Commission. He spent two years in Brazil and one in the United States engaged in research and study. In 1964 he received his Dr Phil. from the University of Copenhagen. During this period his researches were diverse, including *Drosophila* systematics and genetic studies on barley, fish and humans. Also he was clearly one of the first to engage in a critical dissection of the selection process, using *Drosophila* as a tool. In 1967 he was given the mission of establishing a genetics institute at the University of Aarhus where he was appointed Professor and Chairman. His eight years of leadership resulted in a vigorous teaching and research organisation of international stature. During this last phase of his career he became an important figure in the Scandinavian science community. He wrote textbooks for Danish schools and popular articles on genetics. He was a board member of the Scandinavian Genetics Society and member of the Advisory Board of the Danish Atomic Energy Commission, Danish National Scientific Research Council

and Royal Academy of Science and Letters. He completed a full and productive career during his short life.

Max Rudolf Lemberg, who died in Sydney on April 10, will be remembered for his contributions to pyrrole chemistry and biochemistry, as a pioneer of Australian biochemistry and as a Quaker.

Born in Breslau in 1896, his first post-doctoral work was in heterocyclic chemistry with Heinrich Biltz of Breslau University. After a short period finding that he did not like industry, he accepted Freudenberg's invitation in 1925 to work on natural products at Heidelberg University. There he acquired his special skills in bile pigment chemistry, with several prized victories over the Hans Fischer school which then dominated tetrapyrrolic chemistry. He demonstrated that the chromoproteins of the red and blue algae bear a bile pigment chromophore by isolating crystalline mesobiliverdin ester; he showed that oocyan and uteroverdin were both biliverdin and that the 'green haemin ester' of Warburg and Negelein was not a haemin but biliverdin ferrichloride ester. In 1933 he was forced to leave Germany, and went to Cambridge where he had previously come under the influence of Hopkins, Barcroft and particularly Keilin who had much influence on his future interests. From Cambridge he accepted in 1935 an appointment as Director of the Biochemical Laboratories at the Institute of Medical Research in the Royal North Shore Hospital of Sydney. With the help of J. W. Legge, among other colleagues, he elaborated the sequence

of initial oxidative ring opening of the tetrapyrrolic macrocycle while the iron was still present, followed by removal of the iron to form biliverdin which in turn could be reduced by a specific liver reductase to bilirubin. This is today the accepted pathway of haem catabolism to bile pigments. Lemberg's next field was another green haem, the prosthetic group of cytochrome oxidase. He first attacked this through a study, with the late J. E. Falk, of the effect of side chains and their order on the spectra of porphyrin and the corresponding haems and haemochromes. This was followed by painstaking development of methods of isolating the rather labile porphyrin *a* with identification of several side chains. He then worked until his retirement on the mechanism of the reaction of cytochrome oxidase with oxygen, including the spectroscopic nature of the first components with oxygen and the accompanying conformational changes. Lemberg's study of the literature was meticulous and systematic and this appears in his two books, *Haematin Compounds and Bile Pigments* by Lemberg and Legge has been the standard work on the subject since its appearance in 1949. *The Cytochromes* by Lemberg and Barrett appeared in 1973 and critically reviews the literature from 1949 to 1972. Of many public recognitions Lemberg prized most his election to the Royal Society in 1952 and his appointment in 1956 as Professor Emeritus of Heidelberg University. He gave time generously to scientific societies and national committee work and was a foundation member of the Australian Academy of Sciences and of the Australian Biochemical Society.

announcements

Awards

The National Academy of Sciences has announced the election of the following as new members in recognition of their distinguished and continuing achievements in original research: S. A. Adler, H. N. Andrews, C. E. Ballou, G. S. Becker, E. P. Benditt, B. J. L. Berry, H. S. Bloch, B. S. Blumberg, M. Boudart, K. E. Boulding, F. A. Bovey,

R. O. Brady, Jr, J. R. Brobeck, C. M. Brooks, J. J. Burns, G. W. Burton, K. M. Case, B. Chalmers, M. W. Chase, M. J. Cohen, Z. A. Cohn, J. P. Collman, L. N. Cooper, G. M. Cox, E. C. Creutz, F. A. de Laguna, A. H. Doermann, P. Elias, W. G. Ernst, H. Federer, E. Feenberg, G. Feher, H. Frauenfelder, D. Fultz, P. R. Garabedian, R. G. Gordon, C. W. Gottschalk, H. Z. Griliches, R. E. Gross,

F. M. Haurowitz, W. Henle, R. L. Hill, R. H. Holm, D. M. Horstmann, L. M. Hurvich, D. Jameson, R. W. Kates, K. I. Kellermann, J. C. Kiefer, D. E. Knuth, A. H. Lachenbruch, E. N. Lorenz, E. Margoliash, M. V. Mathews, M. Mead, E. T. Mertz, M. F. Morales, J. N. Morgan, E. W. Mueller, D. B. Mumford, J. E. Myers, A. A. Penzias, V. R. Potter, P. B. Price, Jr, C. F. Quate, R. Radner, W. P. Rowe, H. A.