obituary

Luigi Gorini, who was a professor emeritus of microbiology and molecular genetics at Harvard Medical School died on August 13 at the age of 72 in Boston. Luigi was born in Milan, in 1903. Although he received his scientific training in the 1920s, he did not really enter his research career until after the second World War. Because he was one of the few scientists who refused to pledge an oath to the fascist government of Italy in the 1930s, he was unable to secure academic employment. He eventually joined the anti-fascist underground.

At the end of the war in Italy, Luigi was a prime mover in establishing a refuge for the many children who were orphaned. Restricted by lack of money and facilities, Luigi decided that the most needy children were Jewish orphans and he set up and ran the home at Selvino for them prior to their emigration to Israel. In 1976, the account of these activities by Luigi and his wife Annamaria Torriani was laid in the Martyrs and Heroes Archives at Yad-Vashem, Israel.

His first scientific paper was published in 1946 when he was 42 years old. Much of Luigi's early work was on the mechanism of protection of various bacterial proteases by ions such as calcium and manganese. He and his coworkers were able to show that the metal ions protected these enzymes against autodigestion by stabilising particular protein conformations. This work had wide impact in that it provided a strong suggestion that proteins do not have unique folding patterns, but can exist in several different stable states.

Upon coming to the United States, Luigi's interests shifted to problems of gene regulation in *Escherichia coli*. In collaboration with Werner Maas at New York University, he used the chemostat to study steady state growth of several arginine auxotrophs with and without arginine. In this way they discovered a large derepression effect on the arginine pathway and were able to show elegantly how repression and feedback inhibition could interact to exert a coarse and fine tuning effect on the rate of enzyme synthesis and arginine formation in that pathway. These studies helped to establish the concept of end-product repression and derepression in biosynthetic pathways. Luigi and his coworkers later continued to contribute to the understanding of regulation of arginine biosynthesis.

After moving to Harvard in 1957, Luigi's research interests expanded to a study of the effect of streptomycin on the translation of messenger RNA into protein. By demonstrating that streptomycin and mutations of the ribosome to streptomycin resistance could influence the accuracy of translation, Gorini and Kataja provided, in 1964, the first evidence that ribosomes were not merely passive templates for protein synthesis. Rather, ribosomes played an important role in determining the interaction between transfer RNA and messenger RNA. These proposals were confirmed directly by *in vitro* experiments in which it was shown that ribosomes sensitive to streptomycin promote mistakes in reading of the code in the presence of streptomycin and other aminoglycoside antibiotics. Subsequently, in 1969, Rosset and Gorini showed that it was possible to increase misreading by the ribosomes through altering a ribosomal protein by the *ram* (ribosomal ambiguity) mutation.

Thus again this large body of work brought Gorini's focus directly on to a basic mechanism for the control of all growth—this time at the level of translation of the gene code. His subsequent work centred around two of the components at this step—the ribosome and transfer RNA. Many of his results in this area were presented in a review on Informational Suppression in 1970 (*A. Rev. Genet.*, **4**, 107–134). His last projects were concerned with establishing an active role for streptomycin with the ribosome or on one of its components, and on the possible interaction of ribosomes in the coupled transcription–translating system.

In 1949, Luigi was awarded the Kronauer Prize by the Faculty of Science at the Sorbonne, and he won the Ledlie Prize of Harvard University in 1965. He was elected a member of the National Academy of Sciences in 1971.

Luigi remained active in his laboratory until the last few months before his death, both advising people in the laboratory and doing experiments himself. One remarkable feature of his scientific life is that, between the time of his official retirement age of 65 at Harvard Medical School and his death, he published 33 papers.

Luigi also remained active politically. He had many letters published in the newspapers protesting policies he opposed. When Henry Kissinger was awarded the Nobel Prize for Peace in 1973, Luigi organised a petition protesting this award. The petition was sent to the Nobel Committee and received publicity in the United States. He also was very active in the anti-Vietnam War movement and spoke out constantly against the use of genetic arguments to support racial discrimination. The following excerpt from a speech he gave in 1970 at Montana State University gives an idea of his conception of the political role of scientists:

> "My job here tonight is to make you realise that for me, like for hundreds of us scientists, my own scientific interest means a lot intellectually but, morally speaking, science alone does not satisfy entirely my conscience. I will try to be the most unequivocal radical possible and at the same time constructive, so that when I quit, your opinion about me should not be similar to that expressed a long time ago by the fascist Italian police about someone whom I know after his first confrontation with them. He was very happy to be released, for a time at least, but a few years later he discovered by chance the written motivation for letting him out and he was really not satisfied. The police file sounds like the following: 'Lonely anarchist; he is not dangerous'."

The following are excerpts from a conversation between the two of us, J. B. who worked in the same department as Luigi, and M. D. who worked in his laboratory.

M.D. Politics probably shared equal prominence in his life with science.

J.B. He would be horrified when people would do things that didn't fit in with his sense of morality. He never lost his sense of outrage.

M.D. Things were black or white to him. In a way it was a great strength of character. He would never compromise.

J.B. Very frequently in the morning he would come rushing down the hall into my office, holding a newspaper or asking me if I'd seen or heard the news that morning. We had to do something right away about it—compose a letter . . .

M.D. . . . or send off a telegram.

J.B. Or sometimes when he got home he had heard something on the news and he was so upset that he would have to call people. I connect his continued sense of outrage about anything political that upset him with his intense enthusiasm and involvement in his scientific work. He never mellowed in that sense.

M.D. He was always in the lab. before anyone else. He was so enthusiastic that he would have got everyone's plates out of the incubator before they came in.

J.B. It seems amazing to me that he maintained that involvement until the end—that it never dissipated.

M.D. He was talking once about a scientist who was retiring and was going to retire to live in Europe. He said "How can a man live like that without science? If I didn't have something to look forward to every day, what would my life be?".

He was not encouraging in that he would say: "That was a really nice experiment". But it was his enthusiasm that was so overwhelming. He tried to have a personal relationship with everyone in the lab. And discussions about projects, although sometimes heated, were usually fruitful, amicable, encouraging and often hilarious.

J.B. He was physically very active. A few years ago he was climbing mountains in the Dominican Republic.

M.D. We went to Mount Washington once, we drove to the top. We climbed down a way and then climbed back up to the car. He was really amazing. He was walking at a good pace, while everyone else was struggling up.

J.B. He was always telling jokes or funny stories. When he entered this country as an immigrant, he had to answer some questions. One of the questions was about adultery. Luigi answered the interviewer by asking "Do you want a yes or no answer or number of times".

M.D. He was such a good teacher to people in the lab. about life and about everything.

Jon Beckwith
Margaret Duncan

John Donald Rose, FRS, who died on October 14 was a former Research and Development Director of Imperial Chemical Industries Ltd. He was born on January 2, 1911 in Rotherham, near Sheffield and went to Rotherham Grammar School before reading chemistry at Jesus College, Oxford. Throughout his life, he never lost a certain bluff "no nonsense" Yorkshire earthiness. He was also a man of quite exceptional kindness and generosity of spirit, and had a well-developed sense of the ludicrous. The combination of these qualities was exceedingly attractive and it was well-nigh impossible not to like "J.D."

He took a First in chemistry at Oxford, and was awarded a Salters' Institute Fellowship, part of which he chose to spend working in Prof. L. Ruzicka's laboratory at the Eidgenössische Technische Hochschule in Zurich. He joined the Research Department of the Dyestuffs Division of ICI at Blackley in 1935 and is believed to have been the first person to make a sample of Nylon 66 in this country, just as he was later to be one of the first ICI men to develop Whinfield's recently discovered polyethylene terephthalate ("Terylene"). During the war he was a member of, and later head of an Exploratory Research Section, and carried out a thorough investigation of the chemistry of the nitroparaffins. At the end of the war, he was deeply involved in the detailed examination of unpublished German war-time research, and his good working knowledge of German made him a valuable interrogator. Characteristically he was kind and generous to German scientists who were being held as possible war criminals. Thereafter, he was rapidly promoted, becoming Research Director of the Dyestuffs Division in 1951.

It was during his term as Research Director that Rattee and Stevens discovered the reactive cotton dyes, the "Procions." J.D. knew very well that the ICI patent position and technological lead were not initially very strong, and he showed great courage in deploying a major effort, fully supported by his colleagues on the Development side, to get the "Procions" on to the market very quickly—in fact within two years. Considerable faith was needed to persuade the dyeing industry to adopt totally new techniques and concepts, but the venture succeeded and the first three dyestuffs were soon expanded into a full range.

In 1959 he was transferred to the Paints Division as joint Managing Director, becoming Chairman in 1964. In 1966 he joined the ICI Board as member responsible for research and development. He was elected Fellow of the Royal Society in 1971 in recognition of "his contributions to chemical science and its utilisation in industry." After his retirement in 1972 he held office as Master of the Salters' Company (1973), an honour which gave him particular pleasure.

It would be wrong to suggest that J.D. was an outstandingly original scientist—he never claimed to be one. His talent was a great clearness of mind, sound judgement and the ability to guide and encourage those associated with him. Many ICI scientists would gladly agree that their own developments or discoveries owe something, often far from negligible, to him.

He died at the age of 65, leaving a widow, son and daughter, and four grandchildren.

M. A. T. Rogers

Dr Alfred E. Emerson, the world famous termitologist died on Sunday October 3, 1976 at Glenn Falls, New York.

He was born in Ithaca and was educated there, at Cornell University. In 1922 he became an Associate Professor in the Department of Zoology at Pittsburgh University, but moved to Chicago in 1929, to remain there for the rest of his academic career, becoming an Emeritus Professor in 1962.

His major research was on the taxonomy of termites, regarded by the uninitiated merely as pests, but to Dr Emerson fascinating social creatures, posessing, as they do, a large measure of self-sacrifice, a trade union system that runs with a minimum of demarcation disputes, and very sophisticated engineering—some termites air-condition their nests by humidity and heat control (sometimes by using the metabolic heat producton of fungi deliberately brought into the nest for the purpose) and by the cunning design of interconnecting air shafts.

In his research he travelled extensively, living on occasion in tribal villages in the remote jungles of Borneo and the Congo, capturing, cataloguing and classifying termites. His collection, built up over half a century of expeditions, comprises of 1,645 species (to Emerson's chagrin, only 93 per cent. of the known world total) and is preserved, pickled in alcohol, in the Museum of Natural History in New York, to whom Emerson presented it in 1964. It has already proved invaluable to termitologists from all over the world. The fascination of the termite world is conveyed by a book *Termite City* which, together with his wife, née Eleanor Fish, he wrote for children.

This was just one of his numerous publications, dealing with his primary research, evolution (he was a proponent of the controversial but now largely discredited theory of the Superorganism) and ecology. He became interested in ecology long before it was fashionable; he was elected president of the Ecological Society of America in 1941, and, amongst the many honours showered on him, was named 'Eminent Ecologist' by them in 1967.