

ARTICLES



EMMY KLIENEBERGER-NOBEL — 90

A Tribute

From K.S. Zinnemann, Leeds

In February 1982, an internationally known member of the Society celebrated her 90th birthday quietly at her London home in good mental and physical health. Emmy Klieneberger-Nobel was born in Frankfurt-on-Main on 25th February 1892. For her proposed career as a schoolteacher she spent her undergraduate years, from 1913 onwards, at the universities of Göttingen and Frankfurt. In those days keen undergraduates could engage in research work for a Ph.D. during the later stages of their studies and thus Emmy Klieneberger achieved both graduation and her Doctorate of Philosophy in 1917. After a probationary period of teaching in a sixth-form Frankfurt school she took up a regular senior teaching appointment in a privately owned school at Dresden at the end of the First World War.

Having tasted the research atmosphere in a laboratory she became slowly dissatisfied with her work. Against the advice of all members of her large family she searched for a way to return to one of the biological sciences and in 1922 succeeded in getting appointed as non-medical bacteriologist at the Municipal Hygiene Institute

of Frankfurt University. There she was introduced into, and guided in, the subject new to her by the director Max Neisser, a former senior assistant to Paul Ehrlich and nephew of Albert Neisser, the discoverer of the gonococcus. During the 11 years of this appointment Emmy Klieneberger published 25 papers on subjects as diverse as variants in the Enterobacteriaceae group, bacteriophages (a subject completely new to German bacteriology after the First World War), the development of new tests for chemical disinfectants, pleomorphism and its relationship to the development of bacteria and the occurrence of influenza bacilli during the post-pandemic period.

All this activity came to an abrupt end in the Spring of 1933 when the new National Socialist government of Germany dismissed persons of Jewish origin from all official appointments. Emmy Klieneberger went at once to London to seek, not paid employment, but a laboratory bench at which to continue some kind of research work. Her choice of London was the result of a love affair she has had with this country ever since 1910 when as a sixth-former she had spent a happy

time here on a Holiday Fellowship. The only person she knew of but had never met before was B.C.J.G. Knight whom she went to see at the Institute of Medical Research. He referred her to Arthur Felix at the Lister Institute. Felix in his turn recommended her to approach his director, J.C.G. Ledingham via the Academic Assistance Council, then very active on behalf of displaced scholars. Ledingham, with approval of the Institute's Council, offered Emmy Klieneberger a place of work, for a year in the first instance and without pay, to which she brought even her own microscope with camera attachment, the very best Carl Zeiss produced at that time. Ledingham suggested that she explore the infective agent of pleuropneumonia of cattle and the similar one of agalactia of sheep and goats. As a result, in her first English paper in 1934, she described the media and techniques of impression preparations with special fixation and staining she had developed during that year for the growth and observation of these shapeless microorganisms. To Ledingham and the surprised readers of the *Journal of Pathology and Bacteriology* the results seemed to be a bacteriological curio, but in her biologically trained mind she was almost certain that these pleuropneumonia organisms (PPO) were the first known representatives of a new class of microorganisms probably widespread in nature and possibly also connected with disease processes in man. During the following eight years she and others who had become interested, in particular D.G. ff. Edward in this country and L. Dienes in Boston, succeeded in finding several distinct pleuropneumonia-like organisms (PPLO). Eventually PPLOs were classified as Mycoplasmatataceae by Edward & Freundt in 1956.

For a time confusion reigned caused by Emmy Klieneberger and collaborators describing wall-free, shapeless forms in association with *Streptobacillus moniliformis* and later other bacteria regarded as symbiotic PPLOs. Later she distinguished these as L-forms (L for Lister Institute) which were shown to be filterable, degraded bacterial elements capable of regenerating normal bacterial cells with a wall. The Second World War interrupted these studies, but the advent of penicillin and other antibiotics in the immediate post-war period introduced new complications, in the form of spherical shapes without a wall which also appeared to be L-forms. It took quite some time to disentangle this phenomenon. In the end a multi-authored and definitive note in *Nature* (Brenner *et al.*, 1958) introduced a new conception - bacterial protoplasts - as distinct from L-forms and, unlike the latter, incapable of re-forming a cell wall.

The ultimate vindication of Emmy Klieneberger's original idea was provided by Marmion and Goodburn in 1962 when they showed that Eaton's filterable agent of primary atypical pneumonia in man was in fact *Mycoplasma pneumoniae*. Meanwhile, the international inquiry into these formless microorganisms had become a more organized activity with a First International Mycoplasma Congress in New York in 1958 and a second one, also in New York, in 1965. On

reaching the age limit, Emmy Klieneberger had retired from the Lister Institute in 1962. At the foundation of the International Organization for Mycoplasma in Glasgow in 1975, Emmy Klieneberger was elected its first Honorary Member. In 1980 the President of the Federal Republic of Germany bestowed on her in Bonn the Robert Koch Medal.

In her private life Emmy Klieneberger became the wife of Dr. Edmund Nobel, a Viennese paediatrician and former pupil of von Pirquet, living and practising in London. They married in 1944 but after only two years of married bliss and happiness he died.

Until 1970 she had written review articles and two books, followed by her autobiography first published in 1977 in the German language by Gustav Fischer. Apart from the vicissitudes of an interesting life in our troubled times, in which historical personalities of the world of microbiology are part of the scenario, the hallmark of the autobiography is her modesty, courage, deep humanity and scientific integrity. It took the great success of this volume in Germany, and a good deal of persuasion of her friends, to induce Emmy Klieneberger to engage in its translation into the English language. This was published in 1980 by Academic Press.

On the occasion of the 90th anniversary of Emmy Klieneberger-Nobel's birthday her many friends in this country, all over the world and particularly in this Society, send her their warmest wishes for a healthy, happy and contented future, finding daily delight in tending her balcony and indoor garden in Finchley.

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