Emmy Klieneberger-Nobel D.Sc.

With the death on September 11th 1985 of Emmy Klieneberger-Nobel, the IOM lost the second of its first two Honorary Life Members.

Emmy Klieneberger was born in Frankfurt-am-Main on February 25th 1892, the youngest child in the family of a Jewish wine-merchant. Brought up in a cultured, middle class atmosphere, Emmy entered the University of Gottingen just before the outbreak of the first World War, and studied Mathematics, Physics, Zoology and Botany. After obtaining her doctorate in Botany under Professor Martin Mobius at the University of Frankfurt, she qualified as a teacher and taught for 3 years in a private school in Dresden.

Although Emmy later appreciated her experience as a teacher, she was not happy in the profession. In 1922, therefore, she applied for and obtained an appointment as Bacteriologist at the Hygiene Institute of the University of Frankfurt. Professor Max Neisser had been Director of that Institute since 1909; thus Emmy was trained in routine clinical Bacteriology under one who himself was a pupil of Paul Ehrlich and a nephew of Albert Neisser, the discoverer of the gonococcus. Emmy was not content with merely carrying out the routine work however; with typical enthusiasm she worked long hours on a variety of bacteriological problems. This is evident from her list of publications between 1923 and 1933; the subjects range from methods for assessing the efficacy of disinfectants to studies of phages. Courses in Bacteriology for medical and science students were also run at the Institute, and in 1930 Emmy qualified as Lecturer in the Medical Faculty of the University. In accordance with the practice in German Universities, this involved giving an inaugural lecture which was later published.

This promising career ended abruptly in 1933 when the National Socialist Government dismissed all officials of Jewish origin. Deciding to go to England where she had happy memories of a girlhood visit, she found refuge at the Lister Institute of Preventive Medicine; here she was to remain for the rest of her fruitful working life, 29 years in all. She was always grateful to Professor J. C. G. (later Sir John) Ledingham, then Director of the Lister, for providing her with a place to work and for his continued interest and encouragement.

The morphology and structure of living things always fascinated Emmy. It was, therefore, very much in keeping with her own inclinations when Professor Ledingham suggested that she might study two highly pleomorphic organisms which were then regarded rather as microbial curiosities. These were the agents of contagious pleuropneumonia of cattle and agalactia of sheep. Emmy first developed improved methods of cultivating these organisms and for studying their morphology, and then began to look for similar forms in other hosts because she was convinced that these agents were only representatives of a group that could be widespread in nature. She first found other "pleuropneumonia-like organisms" (PPLO) in laboratory rats and mice; L3 and L4 associated, respectively, with bronchiectasis and polyarthritis in rats, and L5 with "rolling disease" in mice. Anyone who has worked with mycoplasmas under the cover of antibiotics can appreciate the skill and patience that must have been required to obtain and study these organisms in pure culture during the pre-antibiotic era.

It was while working on rats that Emmy discovered the first L-form, or L-phase (L standing for Lister Institute) of a bacterium; this was designated L1. For some time there was controversy as to whether L1 was an independent "PPLO" like L3, L4 and L5, or a phase in the growth of the bacterium *Streptobacillus moniliformis*, the cause of rat-bite or Haverhill fever in man. Ultimately, however, Emmy satisfied herself that L1 was indeed derived from the bacterium, as Dr. Louis Dienes had suggested.

During the war, work on mycoplasmas was suspended because of shortages, but using her precious Zeiss microscope and a Leica plate camera (purchased during a return visit to Germany in 1934), Emmy studied morphological and cytological changes during the development of various bacteria including *Myxobacterium, Streptomyces* and *Bacillus*. Micrographs produced during this period were later included in her book "Focus on Bacteria", published by Academic Press in 1965. This illustrates her flair for producing beautiful and informative micrographs with a minimum of equipment and without such refinements as a light-meter.

The post-war years produced further diverse studies on mycoplasmas and L-forms. In particular, mycoplasmas from the human genital tract were studied and their role in urogenital disease explored. Toward the end of her working life Emmy produced the first monograph devoted to mycoplasmas: "Pleuropneumonia-like Organisms (PPLO) Mycoplasmataceae", published in 1962 by Academic Press.

In 1962, the year that Emmy retired (at the age of 70!), Hayflick and his collaborators demonstrated that the agent of primary atypical pneumonia in man was a mycoplasma. Following this discovery, interest in mycoplasmas grew, and the value of Emmy's pioneering work became increasingly appreciated. Her conviction that the two organisms she originally studied were only representatives of a much larger group was finally vindicated when, from the late 1960s onward, many new mycoplasmas associated with plant diseases were identified.

For her contribution in opening up a new field in Microbiology, Emmy was honoured by the IOM in 1976 when she was made an Honorary Life Member, and in 1980 when the biennial "Emmy Klieneberger-Nobel Award" was instituted. On her 75th birthday she was made an Honorary Member of the Robert Koch Institute in Berlin. In 1980, Emmy received one of the highest honours accorded to a microbiologist when, in Bonn, the President of the Federal German Republic bestowed on her the Robert Koch Gold Medal.

During her long retirement Emmy travelled widely; many members will remember her at meetings in New York, Glasgow and Freiburg. Visits to her niece in Columbia were anticipated, characteristically, by her learning South American Spanish. She also helped a number of foreigners with their English; having herself experienced the problems of mastering English, this tutoring gave her great satisfaction. The garden on the balcony of her pleasant Hampstead flat was also a source of enjoyment and pride; her aptitude for cultivating fastidious microorganisms seemed to transfer easily to the cultivation of flowers! When in 1984 ill-health forced her to give up her flat and move into a residential Home, she was philosophical about it and continued to keep her mind active by, among other things, memorising verses by Goethe. Indeed, she retained her mental faculties to the end.

In 1977 Emmy Klieneberger-Nobel published her autobiography in German; an English version under the title "Memoirs" appeared in 1980. Many IOM members have this in their possession; for those of us who knew her, it vividly recalls her manner of speech. The enthusiasm, dedication, determination and integrity evident in her work emerge also from this account of her life. The memoirs also testify to her courage and deep humanity. Nazi persecution deprived her of three close relatives as well as forcing her and many other members of her family to flee as refugees. When she later married Professor Edmund Nobel, a paediatrician, and like herself a refugee from the Nazis, he tragically died of heart disease only two years after the marriage. Yet the personal tragedies Emmy experienced left no bitterness; characteristically her memoirs end on a note of hope, and her final appeal is for universal love and tolerance. We who were privileged to know her shall remember her with affection and gratitude, not only for her achievements, but for what she was.

Ruth M. Lemcke

A letter from Dr. Leonard Hayflick

I wish to comment on the annonymous "correction" to Dr. Ruth Lemcke's tribute to Dr. Emmy Klieneberger-Nobel and published in the IOM Newsletter Vol. 11, No. 2, May 1986. The "correction" reads "...the comment that 'Hayflick and his collaborators demonstrated that the agent of primary atypical pneumonia was a mycoplasma' should be corrected to read instead 'Chanock and his collaborators...'. Two key references to this important discovery are: Chanock et al. Proc. Nat. Acad. Sci. 48, 41-49 (1962)..."

The first sentence in the "Results" section of that reference reads "The isolation of the Eaton agent and the subsequent passage series were initiated by one of us (L.H.) from a frozen pool of third monkey kidney tissue culture passage fluid..."

I first isolated the unique mycoplasma on a new medium developed by me but only after efforts lasting several months and described in the above reference. I then gave my isolate to Dr. Chanock. We, and others invited by us, later formally named the organism Mycoplasma pneumoniae.

The medium on which I isolated M. pneumoniae was later described by me in detail in the Texas Rep. Biol. Med., Suppl. 1 to Vol. 23, 285-303, 1965.

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Leonard Hayflick
Director

23 May 1986

Dr. Janet A. Robertson
Dept of Medical Microbiology
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Dear Dr. Robertson,

I would appreciate it very much if the attached comment would be printed in the next issue of the IOM Newsletter. If any editorial changes, no matter how trivial, are to be made in my copy, I would like to have an opportunity to approve of those changes prior to publication. If that cannot be arranged I would prefer that this comment be withdrawn from publication.

Thank you for considering this request.

Sincerely yours,

Leonard Hayflick

Leonard Hayflick, Ph. D.
Professor

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
Bethesda, MD 20205

March 24, 1986

Dr. Ruth M. Lemcke
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England

Dear Ruth:

I enjoyed reading Emmy's obituary which you had written for the March 1986 issue of the IOM Newsletter, but it contained an inaccuracy that I feel should be corrected, i.e., "In 1962,...Hayflick and collaborators," etc. As a member of that study group, I can assure you that the more accurate statement is, "In 1962, Chanock and his collaborators demonstrated that the agent of primary atypical pneumonia (PAP) in man was a mycoplasma." That statement, "Hayflick and collaborators," is an injustice to Bob Chanock. It was Bob Chanock's study from the beginning. He brought the study group together and invited both Len Hayflick, who was at the Wistar Institute in Philadelphia, and me at Bethesda to join him in a collaborative study. Moreover, Bob had all of the necessary specimens and materials to effectively conduct such a study and provided us with the materials used for isolation. Len Hayflick's important contribution was that he isolated a mycoplasma from a monkey kidney cell culture fluid specimen which contained 10^4 chick egg infectious doses of the Eaton agent, material given to him and also to me by Chanock. However, cell cultures as well as developing chick embryo tissues are frequently subject to contamination by mycoplasmas (see Van Herick and Eaton, An Unidentified Pleuropneumonia-like Organism Isolated During Passages in Chick Embryos, J. Bacteriol. 50(1):47-55, 1945). It was necessary to show that the mycoplasma isolated by Lenny was the Eaton agent, the causative agent of PAP, and not just another cell culture or chick egg mycoplasma contaminant. All of this work to show that the reputed mycoplasma was the Eaton agent and the cause of PAP was done by Chanock and his Bethesda group. The mycoplasmal agent that Hayflick isolated from the cell culture fluids was shown to be distinct from all other human, bovine, avian, and cell culture mycoplasma species and strains tested by studies performed by Chanock using our Bethesda mycoplasma cultures and corresponding specific antisera required for such studies. The hyperimmune serum prepared by Chanock against the reputed mycoplasma agent showed that the isolated mycoplasma was distinct from all other strains tested. Chanock's collection of acute and convalescent sera from patients with known documented cases of primary atypical pneumonia obtained from four geographically distant epidemics was crucial to the study. It was the studies using these incriminating series of sera which showed that only the reputed agent reacted with large numbers of convalescent but not acute sera obtained from patients with PAP. These were the critical, convincing studies which showed unequivocally "that the agent of primary atypical pneumonia in man was a mycoplasma," and all of these studies were done in Bethesda by Chanock or under his leadership. //

I have always been impressed with your regard for fair play and scientific accuracy, so I am certain that you would want me to set the record straight. It was Chanock and collaborators who showed the agent of PAP was a mycoplasma.

As always, with best personal regards.

Sincerely yours,

Michael F. Barile, Ph.D.
Chief, Mycoplasma Laboratory
Division of Bacterial Products
Office of Biologics Research and Review

cc: Dr. Wallace A. Clyde, Jr., President IOM
Dr. Gail Cassell, President-Elect, IOM
Dr. Janet A. Robertson, Univ. Alberta, Canada
Dr. Robert Chanock, NIH, Bethesda, MD