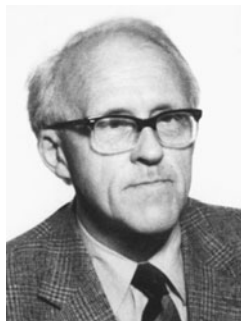


Helge Larsen (1922–2005)

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Helge Larsen

“In the early fall of 1954 I had the good fortune that Professor Kluyver came to Trondheim upon an invitation from Norway Institute of Technology, to take part in my promotion to the status of *doctor technicae*. At that time I had just been approached by representatives of the salt fish industry in Norway, who had inquired of me whether I

would look into the problem of microbial deterioration of salt fish. I happened to discuss this matter with Kluyver and I clearly remember the enthusiasm with which he recommended me to take up work on the microbes of salt and salted products”. Thus, the late Helge Larsen opened the fourth A.J. Kluyver memorial lecture he delivered before the Netherlands Society for Microbiology in 1972. The enigmatic title of the lecture, “The halobacteria’s confusion to biology” (Larsen 1973), was a paraphrase on “The microbe’s contribution to biology”, the title of the famous series of essays based on lectures by Albert Jan Kluyver and Cornelis van Niel.

I first met Helge Larsen, or “Mister Halophile” as he was then known, at a symposium on halophilic microorganisms in Obermarchtal, Germany, in 1985, and again at the 1986 IUMS congress in Manchester. I was a newcomer in the field of halophiles, and I still remember how thrilled I was to meet Prof. Larsen and exchange ideas with him.

Helge Larsen was born in Ålesund, Norway, in 1922. He graduated as a chemical engineer at the Norwegian Institute of Technology in Trondheim in 1944. From 1947 until 1950, he worked with van Niel at the Hopkins Marine Station, Pacific Grove, California. He obtained his Ph.D. degree in 1954 based on a thesis “On the microbiology and biochemistry of photosynthetic green sulfur bacteria”, and in 1955 he was appointed professor of biochemistry at the Norwegian Institute of Technology (now the Norwegian University of Science and Technology) in Trondheim. He retired in 1992.

During his investigations into the nature of the halophilic microorganisms that cause the spoilage of salted fish, Larsen dealt with many fundamental questions related to the adaptation of microorganisms to life at high salt concentrations (Larsen 1962, 1967, 1981, 1986). His chapter on “Halophilism” in “The Bacteria” Vol. IV (Larsen

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1962) was the first comprehensive review written on halophiles. He showed the cell walls of the red halophiles *Halobacterium salinarum* and *Halococcus morrhuae* to be devoid of peptidoglycan, and proved that the specific requirement of *Halobacterium* for Na^+ is linked to the stability of the cell envelope and not to the maintenance of high osmotic pressure (Mohr and Larsen 1963; Steensland and Larsen 1969, 1971). At the time the concept of the Archaea as the third domain of life did not yet exist, and only in the late 1970s it became clear that the special nature of the envelopes of these organisms is also linked to their phylogenetic affiliation.

Further fundamental studies were devoted to the physiological role of the carotenoid pigments of *Halobacterium* as protecting agents against damage by high light intensities (Dundas and Larsen 1962), to the properties of the gas vesicles of *Halobacterium* (Larsen et al. 1967), and to the taxonomy of extreme halophiles. He described *Haloferax volcanii* from the Dead Sea (Mullakhanbhai and Larsen 1975) and named the order *Halobacteriales* (Grant and Larsen 1989). Two new species of extremely halophilic Archaea were recently named to honor his contribution to the field: *Halostagnicola larsenii* (Castillo et al. 2006) and *Haloferax larsenii* (Xu et al. 2007).

In the course of his studies on the microbial deterioration of fish, Larsen was the first to describe anaerobic respiration with trimethylamine oxide to yield trimethylamine, and he also studied ammonia production during anaerobic degradation of fish products. He also developed an efficient process for the industrial production of itaconic acid using *Aspergillus terreus*. He has been a member of the editorial boards of Archives of Microbiology, FEMS Microbiology Ecology, and FEMS Microbiology Reviews.

Helge Larsen passed away in March 2005. An obituary in Norwegian by Prof. Kjell Egil Eimhjellen can be found on the web site of the Norwegian Academy of Sciences (<http://www.dnva.no/c27004/artikkel/vis.html?tid=27016>). It is sad to note that Helge's death passed entirely unnoticed outside Norway. I hope that this belated tribute will help the community of extremophile scientists remember

Helge's contribution (and even today—confusion) to our understanding of the halophiles.

References

- Castillo AM, Gutierrez MC, Kamekura M, Xue Y, Ma Y, Cowan DA, Jones BE, Grant WD, Ventosa A (2006) *Halostagnicola larsenii* gen. nov., sp. nov., an extremely halophilic archaeon from a saline lake in Inner Mongolia, China. *Int J Syst Evol Microbiol* 56:1519–1524
- Dundas ID, Larsen H (1962) The physiological role of the carotenoid pigments of *Halobacterium salinarum*. *Arch Mikrobiol* 44:233–239
- Grant WD, Larsen H (1989) Extremely halophilic archaeobacteria, order *Halobacteriales* ord. nov. In: Staley JT, Bryant MP, Pfennig N, Holt JG (eds) *Bergey's manual of systematic bacteriology*, vol 3. Williams & Wilkins, Baltimore, pp 2216–2233
- Larsen H (1962) Halophilism. In: Gunsalus IC, Stanier RY (eds) *The bacteria*, vol IV. Academic Press, New York, pp 297–342
- Larsen H (1967) Biochemical aspects of extreme halophilism. *Adv Microb Physiol* 1:97–132
- Larsen H (1973) The halobacteria's confusion to biology. *Antonie van Leeuwenhoek* 39:383–396
- Larsen H (1981) The family Halobacteriaceae. In: Starr MP, Stolp H, Trüper HG, Balows A, Schlegel HG (eds) *The prokaryotes—a handbook on habitats, isolation and identification of bacteria*. Springer, Berlin, pp 985–994
- Larsen H (1986) Halophilic and halotolerant microorganisms—an overview and historical perspective. *FEMS Microbiol Rev* 39:3–7
- Larsen H, Omang S, Steensland H (1967) On the gas vacuoles of the halobacteria. *Arch Mikrobiol* 59:197–203
- Mohr V, Larsen H (1963) On the structural transformations and lysis of *Halobacterium salinarum* in hypotonic and isotonic solutions. *J Gen Microbiol* 31:267–280
- Mullakhanbhai MF, Larsen H (1975) *Halobacterium volcanii* spec. nov., a Dead Sea halobacterium with a moderate salt requirement. *Arch Microbiol* 104:207–214
- Steensland H, Larsen H (1969) A study of the cell envelope of the halobacteria. *J Gen Microbiol* 55:325–336
- Steensland H, Larsen H (1971) The fine structure of the extremely halophilic cocci. *Kong Norske Vidensk Selsk Skr* 8:1–5
- Xu X-W, Wu Y-H, Wang C-S, Oren A, Zhou P-J, Wu M (2007) *Haloferax larsenii* sp. nov., an extremely halophilic archaeon from a solar saltern. *Int J Syst Evol Microbiol* 57:717–720