

**MEMORIAL RESOLUTION OF THE FACULTY  
OF THE UNIVERSITY OF WISCONSIN-MADISON**

**ON THE DEATH OF PROFESSOR EMERITUS E. EDWARD BITTAR**

Evelyn Edward Bittar was born October 12, 1928 in Jaffa, Palestine, and died in Madison on April 25, 2013. At the age of 19 while a student in Jaffa, he read an article on Colby College in Maine. Ed decided that was where he belonged, and so a determined young Edward Bittar transported himself to the United States to attend Colby. He went on to Yale Medical School where he became a physician but caught the bug for research very early on. After a stint in the Navy and his internship, he left the U.S. for England where he spent about ten years as a post-doctoral scientist in distinguished labs in Bristol, Oxford and Cambridge before coming to Madison. Ed was professor of physiology here from 1970 until his retirement in his late sixties in 1997.

Ed had a distinguished career at UW. His principle research area was sodium transport, and in particular the sodium pump, which was one of the most exciting fields of physiology research during the middle of the 20th century. The idea that cells could use energy from ATP to transport an ion across a membrane against its electrochemical gradient epitomized the difference between biology and physics/chemistry. Essentially the simplest laws of thermodynamics could be apparently defied by biological structures. Of course this was not true, i.e., thermodynamics was not being defied, but biology was able to cause events to occur that would not happen in the inanimate world because it could link two very different forms of energy together to create processes that were essential for life. To a large extent, the sodium pump was a key to the life of the animal cell. Ed latched on to the excitement of this field very early and developed a marvelous preparation for studying this energy transformation.

Using the giant muscle cell of the barnacle, he was able to measure sodium transport across a living single cell membrane and was able to manipulate the environment on both sides of the membrane. This required sophisticated techniques, and it allowed to be made a beautifully constructed description of the factors that regulated this sodium pump. In addition, during that period Ed discovered the existence of sodium pump-independent sodium carriers. These transporters, which were little-known at the time, are now known to be of great importance in the movements of many ions and water. In studying sodium movements, he focused on the role of the sodium transport-regulating hormone, aldosterone, as well as the new and exciting small molecule, cyclic AMP, and on the calcium ion, both of whose importance in regulation of biological function are now well recognized. He worked on how these factors were able to regulate sodium transport, and many of his studies were directed towards the actions of these hormones and second messengers on recently identified protein kinases, and on how these protein kinases affected the sodium pump. Over a period of 25 years, he published a series of approximately 90 papers, many of them in premier journals on this general topic, also branching into mechanisms of metal toxicity using the same model system. This was done in collaboration with several post-doctoral workers, graduate students in physiology, and laboratory technicians.

Ed was far more than 'merely' a laboratory scientist. He was a passionate teacher and taught medical students here with a dedication and excitement that could not be ignored. Sometimes he talked more about current research than some students wanted, but he felt very strongly that future physicians should understand where basic knowledge came from, and he never deviated from this value. Many students were excited by his passion and his knowledge. Many are the memories of Ed, a dynamic, somewhat diminutive, figure moving with huge alacrity through the aisles of the lecture hall in Bardeen, lecturing as he walked and at the same time involving individual students in the dialogue he was having with the class. He cut an energetic, dynamic figure of the archetypical professor imparting the gist of a subject he loved to the future generation of physicians.

Ed arrived in Madison to teach physiology as a cell biologist and jumped into a department that had a formidable reputation in organ system physiology but was only just beginning to recruit in the emerging cell physiology. He was a pioneer here. He developed the first journal club/seminar program in the department and devoted it to cell physiology of membrane transport and was able to gather around him scientists from different departments for exciting Wednesday afternoons. This was just a small component of Ed's widespread interests and passion for cellular biology. He both authored and edited an essentially uncountable number of iconic texts on different aspects of cell biology during his 35 years at Madison, including the several years after retirement; they number at least 40. These volumes were used by a huge number of young scientists (some authors of this memorial resolution included!) who were interested in cell biology research as well as by medical students and physicians who wanted to apply to their disciplines what was known about cell biology. The value of these volumes, which took a vast amount of work to edit, cannot be overestimated. One remembers very well the frustrations that Ed would express about these so-and-so authors who were months late getting him their manuscripts. One also remembers Ed's office, which was completely filled with manila folders labeled with terms such as internal pH, calcium exchangers, blood cell volume, etc., and chock-a-block filled with xeroxed and original manuscripts. A treasure trove. Ed was a true renaissance scientist. He loved science and knew a vast amount about a large number of unrelated fields. He was an inspiration to younger scientists in the department.

In addition to his insatiable appetite for science, Ed was passionately involved in the politics of our society and of his native region—the Middle East. He was always willing to talk about politics in a most excited fashion, with allusions to history and literature that were truly astounding to hear from a cell biologist. His knowledge of world history, of the politics of many countries that he had no business knowing about, and of literature was, to use a term currently in vogue, 'awesome.' He was one of the most generally knowledgeable, articulate and passionate of scientists. It was indeed his love for, and involvement in, the Middle East that proved both his most shining and desolate times, as he watched the Arab-Israeli conflict escalate yet again in the Intifada that arose in the 1980s and '90s. He suffered deeply for the devastation that hit the region and the pain inflicted on the Israelis and Palestinians. It was on a trip to the Middle East in the 1990s that he met with the then-leader of the Palestine Liberation Organization on the West Bank of the Jordan in the wee hours of the morning. He had a plan for peace which he had communicated and which Yasser Arafat wanted to discuss.

E. Edward Bittar was a true man for all seasons. A pioneering bench scientist, a scientific intellectual who appreciated the history, the concepts of biology as they fit into a whole, and had the passion and energy and care to communicate this gift to the scientific community through huge numbers of classic texts and volumes. He was a man who was deeply committed to the issues of his time far beyond the reaches of science and who suffered dearly for his concern and his empathy. He was a man of great intellectual depth who appreciated and knew our literature and history and who loved to communicate, argue and be outrageous. Last but by no means least, Ed was a devoted family man, being the parent of four children, several of great musical talent, and a long-time beloved husband of Irmgard, who herself affected our city with a prodigious musical teaching career. He had a very strong relationship with his brother, Neville. Ed was a larger-than-life character who enlivened and enriched the lives of many others. Those who knew him are sad that they will not be able to spend more time with him.

MEMORIAL COMMITTEE

Peter Lalley

Peter Lipton, committee

Lea Ziskind-Conhaim