

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

ON THE DEATH OF EMERITUS PROFESSOR MALCOLM R. IRWIN

Malcolm R. Irwin, Emeritus Professor of Genetics, died October 9, 1987, due to complications from a stroke. He is survived by his wife, Margaret, and a daughter, Harriet Anne, both of Madison, a son, Joseph Robert, of Pittsburgh, and four grandchildren.

Bob Irwin was born March 2, 1897, in Artesian, South Dakota. He graduated from high school in Ireton, Iowa, in 1913. His entire graduate education was at Iowa State College at Ames, where he received the B.S. degree in 1920, M.S. in 1925, and Ph.D. in 1928. His undergraduate career was interrupted by six months service in the United States Army during World War I. From 1921 to 1924 he was at the American Farm School in Salonika, Greece. His Ph.D thesis dealt with inheritance of resistance to the Danysz bacillus in the rat.

During his last year of graduate school at Iowa State he was instructor in Genetics. Then followed a year each of postdoctoral fellowships at the Bussey Institute of Harvard University and the Rockefeller Institute in New York. He joined the University of Wisconsin in 1930 as Assistant Professor of Genetics and Bacteriology, became Associate Professor of Genetics in 1936, and Professor in 1939. He was Chairman of the Department of Genetics from 1951 to 1965.

All of Irwin's work involved some aspect of immunology. During his first years at Wisconsin, he was actively involved in research on Brucellosis in cattle. With colleagues in the Department of Veterinary Science, he was instrumental in establishing both the effectiveness and the limitations of vaccination against brucella infections. This research was crucial for the design of programs that succeeded in eradicating this once widespread disease of animals and humans.

In the Genetics Department he found a research problem ready-made for his immunological skills. L. J. Cole had made numerous hybrids and backcrosses among various pigeons and doves. Irwin used this material to study the inheritance of blood antigens between species and even genera. Previous work on inheritance of antigens, such as the human blood groups, had all been done within a single species. Irwin found some antigens common to all species, some common to the most closely-related ones, and others unique to a single one. Yet each followed the Mendelian pattern within and between species. This added strong support for the view, not then accepted by all biologists, that differences between species, genera, and higher categories are no different in kind from those within species, only in amount.

Later, he found that there were complications. Sometimes--not often, but enough to destroy facile generalizations--an antigen in a species was not found in the hybrid. When this happened the hybrid produced a new antigen, not found in either parent. Nevertheless, he was able to show that the "hybrid substance" was the result of interaction between Mendelian alleles. The complications of species differences could, in these cases, be resolved by genetic analysis. It was the dove and pigeon work that led to Irwin's receiving the prestigious Elliot Medal from the National Academy of Sciences in 1938.

He soon extended his work to the study of cattle erythrocytes. He and his associates quickly discovered a plethora of variants, with many gene loci involved and multiple alleles at most of them. The variability is so great that almost every individual is unique. This great variability and the basic principle that no antigen is found in an individual that is not present in at least one of the parents led to immediate practical application. With the rapid increase of artificial insemination there came a strong need for unambiguous determination of paternity in doubtful cases; the blood groups provided this information and soon found wide application among breeders.

The most important finding from the cattle blood groups was made in collaboration with Ray D. Owen and published in 1945. Owen made the astonishing discovery that often in nonidentical twin calves each had all the blood group antigens of both; in fact, each twin had a mixture of the

two kinds of blood cells. It was quickly inferred that there had been an exchange of blood cells through the extra-embryonic blood vessels. Since it was well known that antibodies destroy blood cells with foreign antigens, why didn't each twin destroy the cells from the other? This led to a fundamental discovery, that of immune tolerance, whereby early exposure to an antigen prevents subsequent antibody response to that antigen. When Sir Peter Medawar received the Nobel Prize for further developments in this area, he mentioned the pioneering work of the Wisconsin group as providing the basic insights.

This finding also had an immediate practical application. Cattle farmers had long known that female twins with a male co-twin are usually sterile; they were known as freemartins. The sterile females were always those that had exchanged blood cells with their co-twin as embryos. Thus, by examining the blood of a new-born female with a male co-twin, Irwin could identify those newborn calves which would later be fertile--important information when expensive dairy cows are involved.

The pigeon and cattle work continued through Irwin's career, but was extended to other species such as sheep, swine, chickens and ducks. Among the more unusual findings was the "J substance," studied in collaboration with Clyde Stormont and William H. Stone, who later became a Wisconsin faculty member. This antigen, rather than being synthesized autonomously by the individual cell on which it was found, was a constituent of the serum, from which it became attached to the blood cell surface. The J substance turned out to be a polysaccharide, very similar to the A substance in humans. Irwin's laboratory for many years was a training ground for a large group of immunogeneticists who have gone on to make significant contributions to blood group work and to basic immunology.

Bob Irwin was the recipient of many honors: the Daniel Giraud Elliot Medal of the National Academy of Sciences in 1938; the Morrison Award of the American Society of Animal Science in 1962; the H. von Nathusius Medal of the Deutsch Gesellschaft fur Zuchtungskunde in 1965. He was elected to the National Academy of Sciences in 1950 and to the Royal Swedish Academy of Agriculture in 1952. He was willing to do his share of the chores, as evidenced by his serving as Treasurer of the Society of Naturalists from 1942 to 1944 and Secretary-Treasurer of the Genetics Society of America from 1947 to 1949. His popularity with his scientific colleagues is shown by his having been elected Vice President of the Genetics Society of America in 1950 and President in 1951.

Bob Irwin had three outstanding personal characteristics. First, he was exceedingly loyal and devoted to the University and to the genetics program. His was a participating loyalty, not simply lip service; he did far more than his share of administrative and committee work. He recruited faculty. He was active in the Graduate School Research Committee. He did all of the detailed planning and coordination for the construction of the present Genetics Building. Second, he was modest, almost to a fault. He always minimized his own part while extolling the accomplishments of others. His third trait was his unfailing pleasant manner and sense of humor. He loved hearing a new joke and retelling it; his associates could count on being regularly greeted with a story. His hearty, infectious laugh will always be remembered by his wide circle of friends.

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