

## THE LEGACY OF JONAS SALK (Version for Students)

Jonas Salk, best known as the developer of the first successful vaccine against paralytic poliomyelitis, also made many other contributions in the fields of medicine and biology, philosophy, architecture and the history of medicine. As a child, he was concerned about injustices in life and he hoped to study law and become a member of Congress. He became interested in science and medicine, however, and after his medical training he entered research rather than private practice, hoping to be able to help many rather than a few. His earliest concerns remained with him and he expressed them through biology and medicine rather than through law.

### Vaccinology --

Through his contributions to the development of the first successful inactivated vaccines against influenza (1940s) and his subsequent development of an inactivated poliovirus vaccine (1950s), Jonas Salk established that noninfectious vaccines could protect against viral diseases. This idea ran counter to the prevailing belief that only vaccines containing live, infectious viruses could be effective. His work was the foundation for the modern array of vaccines made from noninfectious materials, including killed whole viruses or parts of viruses. He introduced the term "vaccinology" to describe the development of effective vaccines based on specific requirements for inducing immunity rather than any preconceived notions of mechanism.

In 1987 he proposed a novel "therapeutic" vaccine to control the acquired immune deficiency syndrome (AIDS) in persons already infected with the human immunodeficiency virus (HIV). This inactivated whole virus vaccine is being evaluated as both a therapeutic vaccine and as a preventive vaccine for individuals not yet exposed.

### Poliomyelitis and Public Health --

Techniques developed by Jonas Salk for virus typing, virus culture and principals of vaccine manufacture continue to be used today. The inactivated poliovirus vaccine was released for general use in 1955. Within six years, the incidence of paralytic poliomyelitis in the United States was reduced by 95%. In other countries where the inactivated vaccine continued to be used exclusively, paralytic poliomyelitis disappeared. What had been one of the most frightening epidemics of the twentieth century was rapidly brought under control in the developed world.

In the late 1970s Jonas Salk collaborated to standardize and produce an inactivated poliovirus vaccine that would be effective in a single dose and could be combined with other childhood immunizations. Such a combined vaccine would benefit the developing world, where live oral poliovirus vaccine is less effective than had been hoped. In 1977 he first suggested that poliovirus could be eradicated from the world, a goal formally adopted by the World Health Organization in the 1990s.

## Biology and Society --

In 1960 he established The Salk Institute for Biological Studies, dedicated to advancing knowledge relevant to the health and well being of man. This Institute, in San Diego, CA, is now one of the preeminent biomedical research centers in the world. The buildings that house it were designed by the noted American architect Louis Kahn, whose collaboration with Jonas Salk in this project has influenced subsequent architectural thinking and laboratory design.

In 1961 Jonas Salk observed analogies between the development and function of the central nervous system and the immune system and in this respect was one of the founders of the field of psychoneuroimmunology, the study of how mind, nervous system and immune system work together.

He published four books of essays, was the author of many other short papers and lectured widely on the subjects of human life and the nature of evolution. He was deeply interested in the fulfillment of man's biological potential and man's place in the metabiological world. He applied these intellectual concepts to practical social issues in many ways. As a Director of the MacArthur Foundation, he helped to create the MacArthur Fellowship Program, a new approach to philanthropy, and he influenced the Foundation's support of health related issues. In 1986 he established The Jonas Salk Foundation, a nonprofit organization dedicated to the encouraging the practical application of knowledge to fulfill the human creative potential, to enhance human health and well being and to prevent crippling and death due to human conduct and other causes.

His personal archives, now housed at the University of California, San Diego, are one of the largest, most complete collections of a twentieth century scientist.

*NOTE: An extended version of this essay appears in Milestones of the 20<sup>th</sup> Century (Danbury: Grolier, 1999, pp. 80-81).*

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