

In Honor of



Dr. Arthur Furst

# The Life of Dr. Arthur Furst

*One man can make a difference.*

Life places the burden and the imperative upon us of making the choice of what our lives will be. We can choose to become discouraged, disappointed, and hopeless, or we can rise to each new day with new strength. Dr. Arthur Furst is an inspiration in that he has risen from orphan to an individual of worldwide prominence. His contributions affect all of our lives. He challenges us with the question, "What is your contribution to life?"

Dr. Furst is a man of many dimensions, truly unique human being in the truest sense of the word. In Dr. Furst's own words, "Unique has no qualifiers. Unique means it either is or it ain't." He is!

There is much that lies below the surface of this great science laureate. It would be impossible to cover it all in a little booklet like this. We can cover some of the great scientific achievements, but you will have to discover the warmth and humility of the man as you get to know him.

## Childhood

Art Furst was born in Minneapolis, Minnesota, on December 25, 1914. He had to overcome many adversities in his early years. He was orphaned at the age of four by the great flu epidemic of 1919 which killed millions of people. He was reared in orphanages and by relatives until he entered college. He was sent to an orphanage in Los Angeles far from his birthplace where he lived until his teens.

## Education

Art began as a psychology major at City College of Los Angeles with a minor in education. Later he transferred to the University of California (UCLA) as a chemistry major. He earned an A.B. in chemistry with minors in mathematics, physics, and psychology, and an M.A. in chemistry with minors in mathematics and education.

These early years were tight. Art put himself through college parking cars on weekends at the Hollywood bowl and also at the beaches of southern California.

Art also studied modern dance, and seriously considered a career in dance. He has always had a burning passion for dancing reflecting his joyful and upbeat attitude toward life. Over his life Art has enjoyed everything from the freedom of modern dance to the athletic celebration of his current favorite, Balkan dance.

Early in his career Art considered being either a teacher or a professional dancer. He never considered being a scientist. The turn to science came when he took a chemistry course to fulfill a science requirement and liked it so much that he switched his major to science.

## Marriage

He married Florence Wolovitch in 1940. She is a brilliant and talented woman who contributed not only to his scientific work, but also gave him a wonderful family. Art is quick to point out that it was Florence who graduated from college with honors! Art and Florence have four wonderful grown children and two college age grandchildren.

## Career

On the day of their marriage Art obtained a position teaching chemistry at San Francisco City College. During World War II he taught chemistry at City College of San Francisco, University of San Francisco, University of California at Berkeley, and San Francisco State College. After the war he chose to remain at the University of San Francisco.

While teaching he earned his Ph.D. in chemistry in 1948 at Stanford University. He accomplished this in less than three years.

In the early 1940's Dr. Furst conducted research on organic compounds which led to the theory of *biological antagonism*. He tested his compounds on lactobacilli, tuberculosis, and then cancer. In the area of cancer, he developed his own tumor systems before the National Cancer Institute conceived of a

chemotherapy program. With Dr. Michael Shinkin he coauthored one of the earliest papers showing that cancer chemotherapeutic agents could be effective.

In 1952, Dr. Furst was invited to join Stanford University Medical School in the Pharmacology Department as an Associate Professor. It was here that he developed the cancer chemotherapy program. In 1959 he first elaborated the principles which were published as a major book on cancer in 1963. The book is titled *Chemistry of Chelation in Cancer*.

In this book Art drew scientifically well-founded parallels between the chemical phenomenon of chelation and the action of carcinogens and cancer chemotherapeutic agents. It was here Dr. Furst suggested that platinum compounds should be tested as cancer chemotherapeutic agents.

Dr. Furst returned to the University of San Francisco in 1961 as Professor of Chemistry. He directed the Institute of Chemical Biology until his retirement in 1980. The institute was devoted to study of the toxicology of liquid rocket fuels and also studied combustion technology.

Art wrote the first review of the subject of metal carcinogenesis in 1969. It was an attempt to understand the mechanism of this phenomenon. Dr. Furst published his latest review on this subject in 1987. (Retirement has been essentially meaningless to this man as he continues to contribute to the betterment of all of our lives.)

Art continues to be a full-time consultant in toxicology. One area of his research is the use of earthworms as substitutes for laboratory animals in toxicity studies. He continues to travel and speak internationally. He continually publishes manuscripts and reviews. He has been and remains a key figure in the American College of Toxicology.

### Recognition and Tributes

Dr. Furst has published over 250 papers and abstracts in addition to his books. Dr. Furst has won many awards including:

- The seventh Outstanding Teaching Award by the University of San Francisco (one of less than ten such awards in the University's 160 year history).

- In 1986 the Klaus Schwartz Metal at the VI International Toxicology Congress for his pioneering work in metal carcinogenesis.
- Consultant for the World Health Organization and the National Research Council.
- A special commendation in 1978 from the California State Senate.
- Dedication of a special issue of the Journal of the American College of Toxicology to him in 1989. This is the first and only time this has been done.
- A bronze bust of this man is on display at the Hall of Wisdom at the Royal Medical Society in London, England.
- "If you were to get together all the people in the world who have the same qualifications and experience as Arthur Furst, you could probably seat them at a table for four." — Fred Hooper, Ph.D.
- Listed in seven Who's Who publications including:
  - Who's Who in America
  - Who's Who in the United States
  - Who's Who in the West
  - World Who's Who in Science
  - Who's Who in the World
- Also listed in:
  - American Men of Science
  - The National Registry of Prominent Americans
- Former Professor at:
  - Stanford University
  - Columbia University
  - Weizmann Institute of Science
  - University of San Francisco
- World Expert on Cancer:
  - His studies in the 1940's helped lay the foundation of the theory of biological antagonism.
  - Co-authored one of the earliest clinical papers showing that cancer chemotherapeutic agents could be effective as oral therapy.
  - Working at Stanford University Medical School, he developed the cancer chemotherapy program explained in his book *Chelation and Cancer* (1959).
  - Wrote the first review of metal carcinogenesis in 1969.
- Publication credits: Has published over 250 scientific research papers.
- Organized and until his retirement in 1980 directed the Institute for Chemical Biology at the University of San Francisco.

- Current Activities:
  - Active member of the International Association of Bioinorganic Scientists.
  - On the editorial board of Biological Trace Element Research
  - Senior Member, Neo-Life Scientific Advisory Board
- For the first time in its history the Journal of the American College of Toxicology dedicated a special issue to Dr. Arthur Furst (December 1989)
- Consultant for the World Health Organization and the National Research Council.
- Degrees and Honors:
  - A.B. in Chemistry at UCLA (Dr. Furst is still remembered as an outstanding undergraduate chemistry researcher). In 1992 UCLA established the Dr. Arthur Furst Award for the most promising undergraduate research in Chemistry. This is an annual award which will perpetuate Dr. Furst's reputation forever!
  - 1948 Ph.D. in Chemistry at Stanford University.
  - 1983 D.Sc. (Honoris Causa) University of San Francisco.
- 1984 Diplomate, Academy of Toxicological Science.
- Fellow of:
  - Academy of Toxicological Sciences
  - American Association for the Advancement of Sciences (Life Member)
  - American Institute of Chemists
  - American College of Nutrition
  - American College of Toxicology
  - New York Academy of Science
- World Wide Fame
  - Dr. Furst was recently invited to Germany by their equivalent of the Atomic Energy Commission to update them on the relationship between metals and cancer. Only 20 scientists were expected but 120 showed up to hear Dr. Furst.
  - In Australia a major corporation was involved in an environmental dispute with the government. Both sides could agree on only one scientist to arbitrate and settle the dispute, Dr. Arthur Furst.
  - He was the only toxicologist consulted during the 2 1/2 year study on the development of selected cancers in the United States service men and women with illness from agent orange.

## Dr. Furst and Neo-Life

Dr. Furst joined Neo-Life in 1978 at the invitation of the founder. At the time he was involved in a grueling schedule. He was holding a research position at Mount Zion Hospital in San

Francisco, director of chemical biology and dean of the graduate division.

Dr. Furst's interest in nutrition grew out of his cancer research. He found that carcinogens in the diet could cause cancer, but he also learned that certain nutrients could protect these animals from dietary and environmental carcinogens.

He was attracted to this company because of commitment to a quality product philosophy and also the desire he saw in the company and distributors to genuinely help people. Dr. Furst was a key figure in the development of the proto-guard process of protein manufacture used by the company, the development of Neo-Life's chelated minerals which duplicate the body's own process, nutrients to protect against toxins like Betagard, fat handling nutrients like Lipotropic Adjunct, the Threshold Control process of slow release of nutrients, enteric coatings as found in Acidophilus Complex, and the revolutionary Carotenoid Complex.

Dr. Furst is the Senior Member of the Neo-Life Scientific Advisory Board. As such he guides the ongoing research projects in which the company is involved and makes his valuable contributions.

## Afterward

As we look at his life we are reminded of how lucky we are to have this internationally famous scientist associated with Neo-Life. He is the "wind beneath our wings" lifting up the company and each of us as individuals to achieve our best, to seek to serve all of mankind.

One man can make a difference...

One company can make a difference...

One thought can make a difference...

You can make a difference.

In honoring Dr. Furst, I am sure he would tell us to follow our dreams, to make a difference wherever we find ourselves, to set our fears aside and boldly explore where no man has ever gone before. To reach within and find out just what we are capable of achieving.