

# WILLIAM OLIVER BAKER

## His Life & Influence

A Presentation by A. Michael Noll  
September 2010

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# Contributions

- \* Characterized as “a diplomat of science” - “a science patriot”
- \* Vice President Research at Bell Labs (1955-1973) - “golden years”
- \* Research chemist - carbon polymers; micro-gel rubber
- \* Presidential advisor & confidante
- \* Revered by national security community - Baker Award
- \* Board member & trustee

# Relatively Unknown

- \* Operated behind scenes
- \* Shunned personal publicity
- \* Organization & country before self
- \* Statesman - “the big picture”

# Presentation Summary

- \* Review life history (1915-2005)
- \* Significant accomplishments
- \* Key writings & philosophies
- \* Impact of his career



Courtesy: Aerospace Corporation

# Childhood

- \* Born July 15, 1915
- \* Born farm in Quaker's Neck, MD
- \* Assisted mother in raising turkeys
- \* Attended one-room schoolhouse



# Parents

- \* Harold Baker (1870-1954) & Helen May Stokes (1881-1945), both of Brooklyn, married in 1912
- \* Purchased Comegys Bight Plantation (235 acres) in 1913 on the Eastern shore of the Chesapeake Bay
- \* Helen Baker raised 1,000 breeder turkeys in 1927 & sold them for \$15,000
- \* “Turkey Lady” - “Baker’s Bronze Beauties”  
- wrote book about turkeys



# Education

- \* Graduated Chestertown High School - June 1931 (age 15)
- \* Graduated Washington College (1935) in Chestertown, MD - Maxima Cum Laude - B.S. in physical chemistry
- \* Editor of school newspaper
- \* Graduated Princeton University in 1939 with Ph.D. in physical chemistry - Summa Cum Laude
- \* In 1937, parents sold farm & moved to New Jersey

# Bell Labs



Courtesy: AT&T Archives

- \* Began as research chemist in 1939
- \* Perfected manufacture of synthetic rubber - micro-gel
- \* Polymer carbon
- \* Ralph Bown - VP Research



# Bell Labs Management

- \* Head of the Polymer Research and Development Department – 1948
- \* Assistant Director of Chemical and Metallurgical Research – 1951
- \* Vice President, Research – 1955
- \* President of Bell Labs – 1973
- \* Retired - 1980
- \* 11 Nobel prizes to Bell scientists during Baker's tenure

# National Security

## \* “Baker Report”

\* January 3, 1958 TOP SECRET

\* “Scientific Judgments on Foreign Communications Intelligence”

\* Strengthened role of the NSA & increased use of digital computers

\* Resulted in creation of IDA Communication Research Division at Princeton

## \* Defense Communications Agency

\* 1959 developed plan for Eisenhower - implemented by Kennedy in 1961

## \* National Reconnaissance Office

\* Baker & Edwin H. Land - created in 1961



Henrik Bode, Oliver Selfridge,  
Nathan Rochester, David Huffman,  
Luis Alvarez, Richard Garwin,  
William Friedman, William Baker,  
John Pierce (absent: John Tukey)

# National Service

- \* Personal advisor to Presidents Eisenhower, Kennedy, Johnson, Nixon, Ford
- \* Longest-serving member of President's Foreign Intelligence Advisory Board
- \* October 24, 1962 - US Command & Control headquarters at State Department - told President Kennedy that Soviet ships had turned
- \* November 22, 1963 - lunch at White House mess with Clark Clifford - "the President has been shot"

# Presidents Served

- \* Dwight David Eisenhower
- \* John Fitzgerald Kennedy
- \* Lyndon Baines Johnson
- \* Richard Milhous Nixon
- \* But not “Jimmy” Carter
- \* Gerald Rudolph Ford, Jr.
- \* Ronald Wilson Reagan

# Intelligence Community

## \* Baker characteristics:

- \* operated behind the scenes; with patriotism; little “self”
- \* tremendous memory & ability to see “big picture”
- \* gathered information, giving nothing in return
- \* ideal “intelligence officer”

## \* William Oliver Baker Award

- \* top award in national security in Baker’s honor
- \* awarded by the Intelligence and National Security Alliance (INSA)
- \* yearly since 1985

# Literacy

\* Co-author of 1983 “A Nation at Risk” report to President Reagan by National Committee on Excellence in Education

\* Writings:

“As we have emphasized in ‘A Nation at Risk...’ and in its multitude of interpretations and derivatives, the primary deficiencies have not been with teachers or generally with the educational establishment, but rather with our society at large. Our population have insisted on access without comparable insistence on effort and responsibility.”

“...competency in mathematics and science in primary and secondary school creates literacy.”

“... individual education and genius were the base for human progress.”

From: Education Award Notes, November 28, 1988.

# Areas of Influence

- \* Education: Math & Science Literacy
- \* Research & Management
- \* National Security & Intelligence
- \* Science Policy & Diplomacy
- \* Information Age
- \* Materials Research

# Writings

## \* Research & Management

“... you ask the right questions to stimulate the creative ego and then bend over backwards not to claim credit. This takes a great deal of skill, but it can be done if a culture has been created within the organization that encourages it...” *Research Management*, Vol. XXV, No. 4 (July 1982), p. 8.

“A characteristic failing of modern R&D (research and development) is over-compression of the span between discovery and use, so that basic scientists are expected to become design engineers—and then the whole system crumbles from internal pressures and implosions.”  
*Government Executive*, Vol. 13, No. 6 (June 1981), p. 18.

“The ideas of scientific discovery come one at a time from one person and one mind at a time. Sometimes two or three can aid each other. But scientific discovery cannot be collectivized, and it does not flourish in collectivized structures.” *Science*, Vol. 133, No. 3448 (January 27, 1961), pp. 255-262.

# Writings

## \* National Security & Intelligence

“... we must learn to discount the sheer weight of knowledge, of technical detail, and of operational elaboration ... that a large and busy intelligence bureaucracy naturally feels called upon to deliver to somebody.” *Influence of Future Technology on Intelligence for U.S. National Security. Comments for Senate Select Committee on Intelligence, May 12, 1978.*

“The maintenance of even an uneasy peace depends more fully on intelligence skills, and especially verity, than ever before.” *Notes on PFIAB [President's Foreign Intelligence Advisory Board]. April 7, 1977.*

“While nothing yet replaces human intuition, it is dramatically displaced by the world's electronic sensors, ranging from outer space to underseas, including earth seismic waves from nuclear tests and rocket launchings.” *The Role of SIGINT in Support of National Policy. Talk at National Senior Cryptologic Course, National Security Agency. October 22, 1970.*

# Writings: Science Policy

“... the traditional concept [is] that to get anything to work requires a task force. The phenomenon was fortunately unknown to Galileo, Newton, or Einstein, or other masters of classical and quantum mechanics. But it has become a sociophysical requirement of recent years.” “The People’s Science.” Acceptance talk to the NSF National Science Board on receiving the Vannevar Bush Award in Washington, DC., May 21, 1981.

“...a White House Science Office should not be expected to be a central form of either involving the President systematically in science policy and operations or as a sounding board for the concerns or proposals of the national community.” Letter to Dr. Marcel LaFollette, dated February 6, 1986, regarding “The Continuing Saga of Science Advising in the White House.”

“To assure appropriate detachment of policy from practice in science and engineering requires the genius of making things work in practice so well that nobody will much notice that none of them is even supposed to have a policy associated with it!” “American Science Policy in Practice.” Published in “Milton Harris: Chemist...,” Miklos M. Breuer (Ed.), American Chemical Society, 1982, pp.101-107.

“If we believe in the kind of freedoms and ideals that this country was founded on, we’ve got to find our friends and work with them, and science and technology are very much a part of that strategy.” *SIPIScope*, Vol. II, No. 1 (March-April 1983), p. 11.

# Trusteeships

(partial list)

- \* Rockefeller University (1960-90) Chairman (1980-90)
- \* Carnegie-Mellon University (1967-87)
- \* Princeton University (1967-76)
- \* Andrew W. Mellon Foundation (1965-90) Chairman (1975-90)
- \* Aerospace Corporation (1961-76)
- \* Summit & Elizabeth Trust Company (1968-90)
- \* The Fund for New Jersey (1974-2005)

# Professional Organizations

(partial list)

- \* National Academy of Science - Member (1961)
- \* American Philosophical Society - Member (1963)
- \* American Academy of Arts & Sciences - Fellow (1965)
- \* American Institute of Chemists - Fellow (1968)
- \* National Academy of Engineering - Member (1975)

# Awards

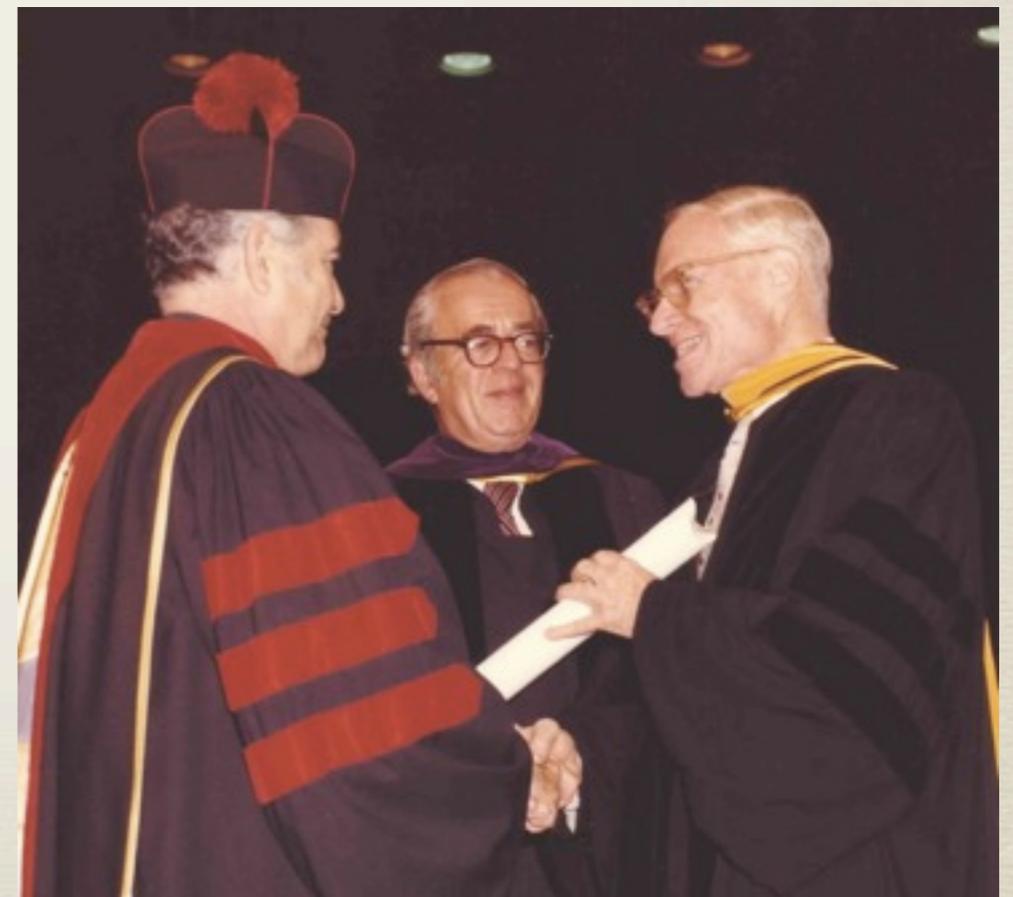
(partial list)



- \* Presidential National Security Award (1982)
- \* National Medal of Science (1988)
- \* Priestly Medal of the American Chemical Society (1966)
- \* Benjamin Franklin Medal - American Philosophical Society (2000)
- \* Fahrney Medal - Franklin Institute (1977)

# Honors

- \* 27 Honorary Doctorates: Princeton University, Georgetown University, Drew University, Northwestern University, Rutgers University, Rockefeller University, Notre Dame University, etc.



# Death

\* Died October 31, 2005

\* His words (1968):

“With all its beauty and power,  
the age of science is in no way old enough to tell us  
what to do or what to think,  
but only sometimes what to ask.”

\* Words of Walt Whitman:

“Sail forth, steer for the deep waters only,  
For we are bound where mariner has not yet dared to go,  
And we will risk the ship, ourselves, and all.”



# Interpretation

## \* Bell Labs

- scientific genius - impact of “bigger picture”
- “right person at right time” - “golden years”

## \* Washington

- post WW II science & technology
- role of Bell Labs research
- Cold War intelligence - telecom & computers

## \* Personality

- no “self” - looked outward
- personal life private
- operated behind scenes
- loyal - avoided sensationalism
- educated - gracious - literate

## \* True greatness - rare

# Credits

- \* Some of the archival and historical research on which this presentation is based was supported by:
  - \* the Annenberg School for Communication at the University of Southern California
  - \* the Andrew W. Mellon Foundation
  - \* the Richard Lounsbery Foundation
  - \* and the cooperation of Bell Labs at Alcatel-Lucent and the AT&T Archives