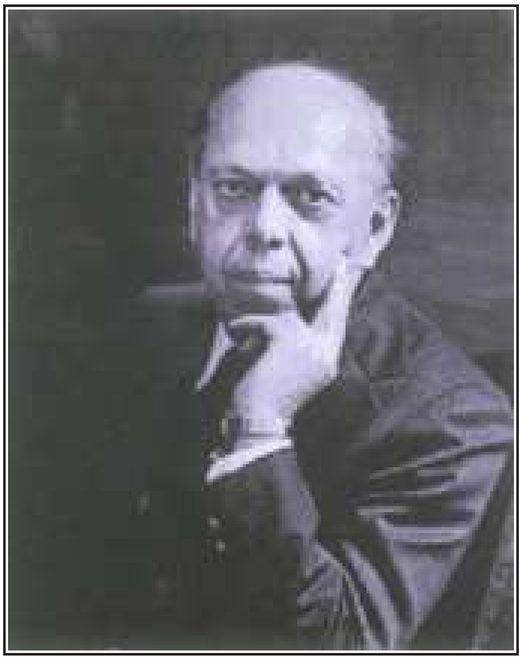
UNESCO – Kalinga Prize Winner – 1972

Philip H. Abelson



World Renowned Scientist, Longtime Editor of 'Science'
and
Co-Discoverer of the Element Neptunium.

[Born : April 27, 1913, Tacoma, WA, USA
Died : August 1, 2004 at Suburban Hospital in Bethesda, Maryland, USA]

Organic matter equivalent in quantity to the weight of the Earth has been created by living creatures since life originated on this planet.
... Philip H. Abelson 1957

"Man is the Product of billions of years of hard-won evolution". We must notrisk permitting Zealots, however well-intentioned, to gamble with the future.
.... Philip H. Abelson, 1966

The imaginative and original mind need not be overawed by the imposing body of Present knowledge or by the complex and costly paraphernalia which today surround much of scientific activity. The great shortage in science now is not opportunity, manpower, money or laboratory space. What is really needed is more of that healthy skepticism which generates the Key ideas - the liberating concept.
....Philip H. Abelson

Philip H. Abelson

Philip Hauge Abelson (April 27, 1913 - August 1, 2004) was an American physicist, editor of scientific literature, and science writer.

Philip Abelson was born in 1913 in Tacoma, Washington. He attended Washington State University where he received degrees in Chemistry and Physics, and the University of California, Berkeley, where he earned his Ph.D. in Nuclear Physics. As a young physicist, he worked for Ernest Lawrence at the University of California, Berkeley. He was among the first American scientists to verfiy Nuclear Fission in an article submitted to the Physical Review in February of 1939 (http://prola.aps.org/abstract/PR/v55/i4/p418_1). In addition, he collaborated with Nobel Prize winner Luis Alvarez in early nuclear research, and was the co-discoverer of the element Neptunium on June 8, 1940 [with Edwin McMillan, who was awarded the Nobel Prize for the discovery].

He was a key contributor to the Manhattan Project during World War II. Although Abelson was not formally associated with the atom bomb project, the Liquid Thermal Diffusion isotope separation technique that he invented was used in the S-50 plant in Oak Ridge, Tennessee, and proved a critical step in creating sufficient fuel for the weapon.

After the war, he turned his attention under the guidancne of Ross Gunn (http://www.nap.edu/readingroom/books/biomems/rgunn.html) to applying nuclear power to naval propulsion. While not written at an engineering-design level, he wrote the first physics report detailing how a nuclear reactor could be installed in a submarine, providing both propulsion and electrical power. His report anticipated the nuclear submarine's role as a missile platform. This concept was later supported by Admiral Hyman G. Rickover and others. Under Rickover's relentless leadership, concept became reality in the form of USS Nautilus, the world's first nuclear-powered submarine.

From 1951 until 1971 he served as the director of the Carnegie Institution of Washington's Geophysical Laboratory, and served as president of the Institution from 1971 to 1978. From 1962 to 1984 he was editor of Science magazine, published by the American Association for the Advancement of Science (AAAS), and served as its acting Executive Officer in 1974, 1975 and 1984. From 1972 until 1974 he served as President of the American Geophysical Union (AGU).

During the 1970's he became interested in the problem of world energy supplies. Books on the topic include "Energy for Tomorrow" (1975), from a series of lectures at the University of Washington, and "Energy II : Use Conservation and Supply". He pointed out the possibilities of mining the Atabascan tar sands, as well as shale oil in the Colorado Rockies. In addition he urged conservation and a change of attitude towards public transit. Philip H. Abelson (1975). Energy For Tomorrow.

Perhaps his most famous work from this time period is an editorial entitled "Enough of Pessimism" ("enough of pessimism, it only leads to paralysis and decay"). This became the title of a 100 essay collection. Philip H. Abelson (1985). Enough of Pessimism.

After 1984, he remained associated with the magazine. Some have claimed him to be an early skeptic of the case for global warming on the basis of a lead editorial in the magazine dated March 31, 1990 in which he wrote, "If the global warming situation is analyzed applying the customary standards of scientific inquiry one must conclude that there has been more hype than solid fact." However, in 1977 in the foreword for a US National Research Council, Energy and Environment report he wrote, "What should the atmospheric carbon dioxide content be over the next century or two to achieve an optimum global climate ?", implying a level of connection between CO_2 and climate that would put him outside today's skeptic camp.

Dr. Abelson received many distinguished awards, including The President's National Medal of Science, the National Science Foundation's Distinguished Achievement Award, the American Medical Association's Scientific Achievement Award, the Distinguished Civilian Service Medal and the Waldo E. Smith Medal in 1988. In 1992 he was awarded the Public Welfare Medal, the National Academy of Science's highest honor.

Dr. Abelson's wife Neva Abelson (1910-2000) was a distinguished research physician who co-discovered the life-saving Rh blood factor test (with L.K. Diamond). Their daughter, Dr. Ellen Abelson Cherniavsky, now retired, worked as an aviation researcher at The MITRE Corporation in Virginia.

Philip Abselson died on August 1,2004 from respiratory complications following a brief illness.

Source :

"http://en.wikipedia.org/wiki/Philip_Abelson"

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Philip H. Abelson
A Biographical Profile

Scientist and Editor

[Born April 27, 1913, Tacoma, WA, U.S.A.
Died : August 1, 2004]

Philip H. Abelson served as editor of Science magazine from 1962 to 1984. As editor, he implemented more efficient peer review procedures for scientific papers submitted to the magazine and encouraged a more active style of science reporting that included broader coverage of science and policy issues. These records include correspondence, memos, editorials and minutes of editorial board meetings. Among his scientific accomplishments collaborated in the discovery of neptunium (element 93), devised a method for large-scale synthesis of enriched uranium for use as a power source in submarines, and was director of the Carnegie Institution of Washington's Geophysical laboratory from 1953 to 1971. A number of Abelson's personal papers, including speeches and other materials not related to his work as editor of Science, were given to the Library of Congress in early 2001.

Abelson made contributions to the fields of nuclear physics, chemistry, microbiology, orgnanic geochemistry, and to studies of the origin of life. He also wrote many items on science policy.

As a graduate student in 1939 at the Radiation Laboratory, University of California, Berkeley, Abelson was the first American scientist to identify products of uranium fission. These included three radioactive isotopes of antimony, six of tellurium, and four of iodine. In 1940 Abeson's attention focused on some work that E.M. McMillan had done the previous year on neutron irradiation of thin layers containing uranium. McMillan had found that most of the fission products escaped from the layer, but that a nonrecoiling 2.3 - day beta emitter remained. Emilio Segrè had postulated that the activity followed the chemistry of the ordinary rare earths and that the substance was not a transuranic. An alternative

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explanation occurred to Abelson. He felt that the activity was due to element 93, but that instead of being an ekarhenium, element 93 was a member of a new rare-earth series. Pointing out that cerium could exist in two valence states, Abelson thought that the easiest way to demonstrate the existence of element 93 might be by its response to oxidzing and reducing agents. He conducted some experiments at the department of terrestrial magnetism of the Camegie Institution of Washington with encouraging but not clear-cut results. The intensities there did not permit use of thin-foil technique.

Abelson went to Berkeley and discussed his ideas with McMillan. The two scientists then collaborated in the discovery of element 93 (neptunium). McMillan prepared and irradiated some of his thin layer material. Within a day Abelson demonstrated that the 2.3-day activity could exist in at least two valence states. In the reduced state the fluoride was precipitated with a cerium carrier. However, in the presence of fluride and bromate in acid solution, the activity remained in solution while fission-product rare earths precipitated. Abelson also learned that element 93 is more readily reduced that uranium. Thus he was able to show by repeated precipitations that the 2.3-day activity is the daughter of a 23-minute uranium activity. The total duration of the research plus preparation of a letter to the editor of the Phisical Review was 5 days.

In 1940 nuclear physicists were already talking of the possibility of nuclear reactors and atomic weapons. There was uncertainty whether a chain reaction could be established using natural uranium. Uranium enriched in ^{235}U seemed the key to many possibilities; partial enrichment of ^{235}U would guarantee a successful chain reaction. One application advocated by Ross Gunn of the Naval Research laboratory was as a source of power for submarines.

The prospects for large-scale isotope separation were dim. At that time only microgram quantities of uranium had been fractionated. Few uranium chemicals were available. Abelson devised a method for large-scale synthesis of UF_6 from UF_4 and produced the first 100 kilograms of the substance. He discovered that the uranium isotopes could be partially separated by liquid thermal diffusion. The process was conducted in an annular space with cold wall at $70^{o}C$ and hot wall at $286^{o}C$, with columns 14 meters long. In a single column a maximum enrichment from 0.7 percent ^{235}U to 1.4 percent ^{235}U was obtained. By mid-1943 more than 100 kilograms of partially fractionated ^{235}U had been obtained, by far the largest amount of fractionated uranium available at that time. A small pilot plant at the Naval Research Laboratory, then a larger pilot plant at the Philadelphia Naval Base, and finally a 2100-column plant at Oak Ridge, TN, were built. The partially enriched uranium (0.85 percent ^{235}U) was used as feed for the electromagnetic separation plant, which in turn produced the ^{235}U employed in one of the first atomic bombs.

After World War II Abelson led a small group that prepared a feasibility report (dated Mar. 28, 1946) on the atomic submarine. The group showed that a nuclear reactor, shielding, and associated propulsion equipment could be substituted for the then conventional equipment and that a very useful submarine might result. Amoung the advantages cited for an atomic submarine was long range at high speed under water. The report also stated that "this fast submarine will serve as an ideal carrier and launcher of rocketed atomic bombs."

In 1946 Abelson began a new scientific career in biophysics. The new venture was a consequence of discussions involving M.A. Tuve, then recently appointed director of the department of terrestrial magnetism of the Carnegie Institution of Washington. Abelson and Tuve concluded that one of the great future frontiers lay in the application of physical methods and theory to biological problems. Subsequently, Abelson was appointed chairperson of a biophysics section, which soon included four physicists and a biologist. The group exploited opportunities created by availability of radioactive tracers, notably ^{14}C. Using tagged glucose and other tagged compounds, including amino acids and CO_2, and employing the technique of isotopic competition, Abelson outlined many of the pathways of the biosynthesis of amino acids in microorganisms.

In 1953 Abelson became director of the Geophysical Laboratory of the Carnegie Institution of Washington and embarked on still another career as one of the nation's pioneers in organic geochemistry. Among his discoveries was the identification of original amino acids preserved in fossils, especially shells. He found alanine, glutamic acid, glycine, leucine, and valine in many old fossils. Subsequently, with T.C. Hoering and Patrick Parker, Abelson isolated fatty acids in old rocks, including some more than a billion years old. In the late 1960s Abelson also elucidated some of the mechanisms involved in the conversion of biological materials into natural gas and pertroleum. An important step is incorporation of amino acids into humic acid and kerogen. Abelson also contributed to the study of the origin of life. He pointed out in 1966 that most model experiments, such as that of S.L. Miller and H.C. Urey, employ assumptions not consonant with the realities of geochemistry. Abelson advanced evidence to support the hypothesis that the Earth's primitive atmosphere consisted largely of CO, N_2, and H_2. Solar irradiation of this mixture produced HCN, which polymerized in the primitive ocean, giving rise to amino acids. Abelson further pointed out that the nature of the environment limited the number of compounds available for life, which began in a thin rather than a thick soup.

In 1962, in addition to his work at the Carnegie Institution, Abelson accepted the editorship of Science, America's leading scientific weekly. In more than 300 editorials and scores of lectures, he treated many aspects of the interaction of science and public policy. He joined J.S. Huxley in the view that humankind now has the power to control its destiny. Abelson felt that at least some scientists should attempt to build bridges between science and society and that such efforts might be the most significant which responsible scientists could engage in during the foreseeable future.

Abelson entered what is now Washington State University in 1930 and received as B.S. in chemistry in 1933 and an M.S. in physics 2 years later. He then entered the University of California at Berkeley, working with Lawrence and the cyclotron in the Radiation Laboratory. After receiving the Ph.D. in physics in 1939, Abelson became associated with the department of terrestrial magnetism of the Carnegie Institution of Washington. Except for wartime work at the Naval Research laboratory, he remained with the institution, serving as its president from 1971 to 1978. For his wartime service Abelson was given in 1945 the Navy's highest civilian recognition, the Distinguished Civilian Service Medal. He also received the Modern Medicine Award (1967), Mellon Institute Award from Carnegie-Mellon University (1970), Joseph Priestley Award from Dickinson College (1973), Kalinga Prize from UNESCO (1973), and Scientific Achievement Award of the American Medical Association (1974). He was elected to the National Academy of Sciences in 1959.

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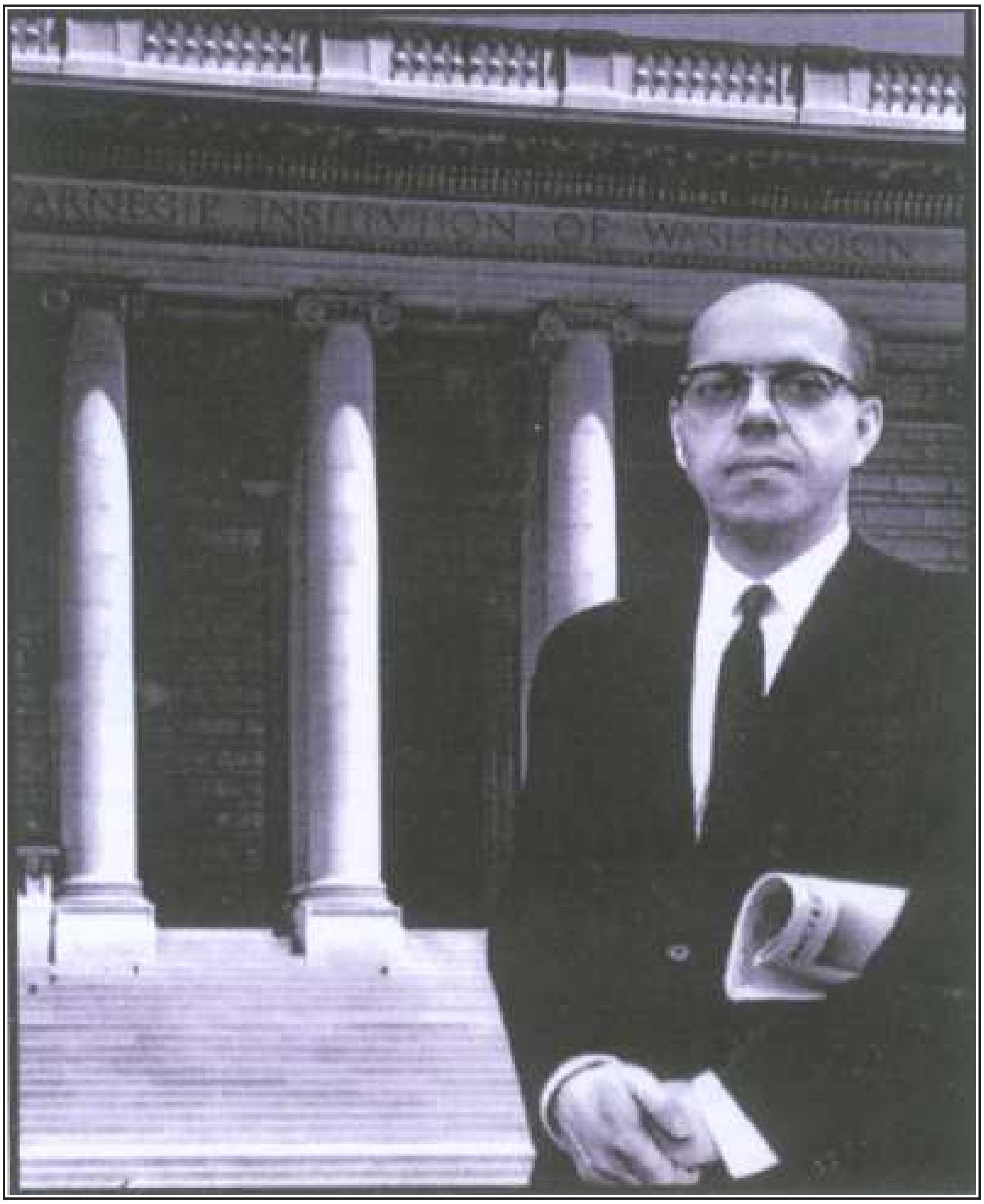
Carnegie Institution of Washington Geophysical Laboratory

Philip H. Abelson

1913 - 2004



(Above) Dr. Philip Abelson at the steps of the Carnegie Institution of Washington's headquarters on P Street downtown Washington, D.C.

Carnegie Institution Positions :

- Department of Terrestrial Magnetism, staff member (1939-1941, 1946-1953)
- Geophysical Laboratory, director (1953-1971)
- Carnegie Institution of Washington, president (1971-1978)

Education :

- B.S. Chemistry, Washington State University, 1933
- M.A. Physics, Washington State University, 1935
- Ph. D. Nuclear Physics, University of California Berkeley, 1939
- D.Sc. Yale University, 1964
- D.Sc. Southern Methodist University, 1969
- D.Sc. Tufts University, 1976
- D.Sc. Duke University, 1981
- D.Sc. University of Pittsburgh, 1982

Societies :

- National Academy of Sciences, board of directors
- American Geophysical Union, president
- American Physical Society, fellow
- Ame rican Academy of Arts and Sciences, fellow
- Geological Society of America, fellow
- Mineralogical Society of America, fellow

Awards :

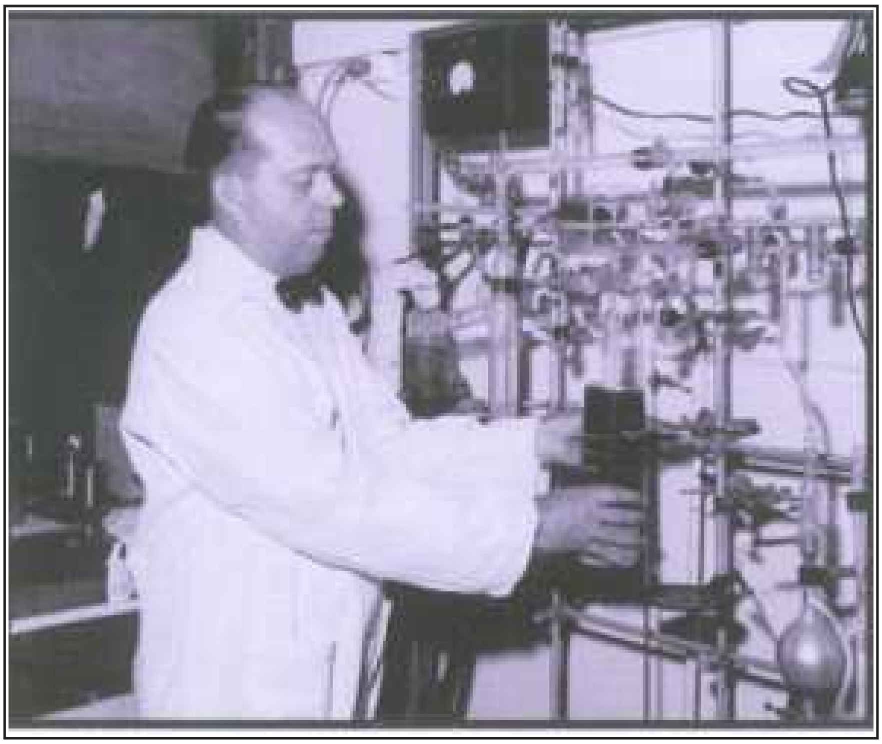
- Distinguished Civilian Service Medal (U.S. Navy)
- Vannevar Bush Public Service Award (National Science Foundation)
- National Medal lof Science
- Public Welfare Medal (National Academy of Sciences)
- Kalinga Prize (United Nations Educational, Scientific, and Cultural Organization)
- Science Achievement Award (American Medical Association)

Dr. Philip Abelson's career at the Carnegie Institution of Washington's Department of Terrestrial Magnetism began in 1939 when he joined as a staff member with specialties in chemistry and physics. He was recruited by Merle Tuve to work on cyclotron development. Abelson served as "asst. physicist" for two years. This advantageous alignment jump started his career, as in 1940, he succeeded in helping to discover the element Neptunium. Neptunium, a metal by product of uranium, became the ninety third element in the periodic table. Abelson's co-dicoverer, Edwin M. McMillan, later won the Nobel Prize for the finding.

With his credit fully established as a prominent nuclear physicist, took a leave of absence from Carnegie in 1941 to transfer to the Naval Research Laboratory. There he concentrated on developing methods of splitting uramium isotopes that were instrumental in creating the first atomic bomb. This research spawned a 1946 paper that described how a nuclear reactor could be installed in a submarine. The Navy later used his design to build the first nuclear submarine in 1955, the U.S.S. Nautilus.

Abelson returned to the Department of Terrestrial Magnetism in 1946 and served as a staff member and head of the biophysics section until 1953. He and his colleagues undertook pioneering studies of the metabolic pathways in bacteria using radioactive tracers.

In 1953, Abelson left the Department of Terrestrial Magnetism to become the director of the Geophysical Laboratory. During his time there, he discovered the ability of amino acids to survive in fossils at low temperatures for millions of years. His work was extremely instrumental in starting an organic geochemistry program at the Laboratory.



(Above) Philip Abelson, pictured in 1947, as he prepares a laboratory sample for isotope analysis in order to study how biomolecules are preserved in the fossil record.

In 1962, Abelson became the editor of the popular journal *Science.* The position allowed him to not only chronicle laboratory advances, but to write over five hundred editorials on topics like medical research, national energy policies, microbiology, food, electronics, healthcare, and earth science. His unwavering dedication helped to increase *Science's* circulation from 75, 000 to 155,000 by his retirement as editor in 1984.

Abelson served as director of the Geophysical laboraroty until 1971 when he stepped upto become President of the Carnegie Institution of Washington until 1978. Abelson was renowned for his scientific contributions and respected for his integrity.

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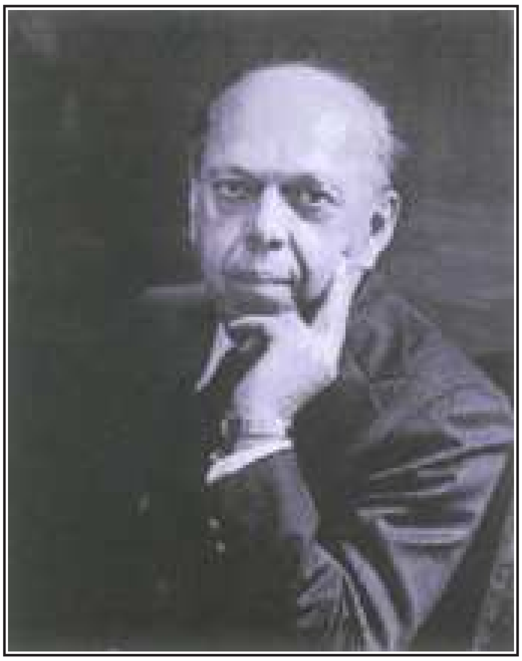
SC/WS/584
29 January 1974

UNITED NATIONS EDUCATIONAL,
SCIENTIFIC AND CULTURAL ORGANIZATION

Address by
Mr Philip H. Abelson,
President, Carnegie Institution of Washington,
And Editor, Science

on the occasion of the presentation of the
Kalinga Prize
for the Popularization of Science

Unesco House, Paris, 20 December 1973



I am most happy to be here in Unesco House to participate in ceremonies attending this award. When Mr. Patnaik established the Kalinga Prize in 1951 he demonstrated foresight and judgment. In his recognition of the need to increase public understanding of science, Mr. Patnaik was soon joined by others, including the American Association for the Advancement of Science. In that same year, this organization announced that one of its principal aims henceforth was "to increase public understanding and appreciation of the importance and promise of the methods of science in human progress." Since then, in every annual meeting of the Association and in the quarterly meetings of the board of directors, this topic has had a central place. Accordingly when the announcement was made of the Kalinga Prize for 1973, member of the Association and the board of directors joined me in being highly pleased with the news. I am greatful to all who have made this occasion possible.

With the passing yeas the necessity for better understanding of science by the public has increased. At this time, in the midst of an energy crisis, it is especially desirable that the public understand what it can and can not expect from science and technology. Because the energy crisis is of such central concern, I will make a few remarks about it.

The world has moved into a new era with respect to energy. The happy days of cheap, abundant petroleum are gone forever. Even before the Arab-Israeli War the oil producing and exporting countries had begun to increase prices. A few years ago the producing countries received about $ 14 per metric ton for their oil. Recently the Shah of Iran obtained $ 125 per ton for a large quantity of petroleum. Other producers are currently receiving smaller returns for their oil, but in each passing week there are additional announcements of major increases. The oil exporting countries are enjoying tremendous profits and political power. They will not meekly or quickly return to their status of early 1973. Sooner or later a new balance between demand and supply will be arrived at but at a cost for oil considerably above that of three months ago. What that price will lbe is indeterminate. Obviously, if demand is curtailed and if new sources of oil are developed the price will not be so great. Accordingly the oil consuming countries must reexamine their policies with respect to energy.

High on the agenda should be research and technology aimed at conservation. From observation in my own country I am satisfied that after some years the consumption of hydrocarbons there could be cut in half without substantial loss of comfort or efficiency. I am not talking about such measures as rationing or a ban on Sunday driving, but rather about use of smaller automobiles, better insulation of homes, and improved industrial processes.

Conservation efforts aimed at lessening the use of oil in some of the other consuming countries can not be expected to yield such a large saving as in the United States. However, a careful evaluation would doubtless point to economies.

An obvious means for diminishing use of oil is to replace it by coal or nuclear energy in the generation of electric power. In some countries coal could also supplant oil as a source of energy for industry.

The current shortages will cause an intensification of exploration for new sources of oil and of development of better methods for extracting oil from known reservoirs. A brief description of some development in North America is illustrative of what can be done.

Adjacent to the United States on the continental shelves are substantial areas with geological features that usually are associated with large quantities of oil. Exploration of these potentialities will be expedited as a result of the current situation.

Present production methods result in the extraction of only a third of the oil known to be present in many reservoirs. Higher prices will justify expenditures needed to produce a larger fraction.

There are three potential sources of oil in North America, each of which exceeds the known reserves in the MiddleEast.

In northern Canada in Alberta are the Athabasca Tar Sands. These contain the equivalent of about 100,000,000 tons of oil. A successful commercial plant there has been in operation for about five yeas producing oil for less than $20 per ton. Another large plant has been authorized. In principle, production in Canada could be vastly expanded were the Canadians so minded. Indeed it would be possible for Canada to produce enough oil to meet all lof Europe's needs for a long time.

The other possibilities are less advanced. In western United States are shales containing vast quantities of oil. Engineering estimates indicate that the oil can be produced for about $25 a ton.

Nost of the regions of the United States contain substantial deposits of coal. The current situation is bringing about intensification of research aimed at obtaining hydrocarbon liquids by hydrogenation of coal.

President Nixon has called for energy independence by 1980. Until now the scientific and technological potential of the United States has not been mobilized. However, after the people of the country have experienced discomforts and shortages this winter they will demand action. Congress and the President will have no alternative but to mount major programs that could result in energy independenc considerably prior to 1980. Indeed, it would not be surprising if the United States were again to become an exporter of petroleum.

All of us are aware that total resources of oil and coal are limited. Nuclear energy, particularly that derived from breeder reactors, is of considerably greater potential magnitude. Even so that too is limited. Fusion research holds out the possibility of a vitually infinite source of energy, but the research may not succeed. The most prudent assumption is that mankind will have at its disposal finite sources of energy and that ultimately it must move towards use of renewable sources of energy and materials. The current crisis will tend to reinforce this view.

In the move toward an enduring economy, science will play a mojor role and there will continue to be a need for public understanding of science and of its consequences. Mr. Patnaik's vision in establishing the Kalinga Prize will continue to be justified for a long time.

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NEPTUNIUM

Mr. ROBIN GIROUX, CHEMICAL & ENGINEERING NEWS, WASHINGTON

Np

93

CELEBRATING C&EN'S 60TH ANNIVERSARY

NEPTUNIUM
AT A GLANE

Name	:	Named for the planet Neptune, which takes its name from the Roman god of the sea.
Atomic mass	:	(237)
History	:	Discovered in 1940 by Edwin M. McMillan and Philip H. Abelson at the University of California, Berkeley.
Occurrence	:	Trace amounts found in uranium ore.
Appearance	:	Silvery solid.
Behaviour	:	Radioactive.
Uses	:	Neptunium - 237 is used in neutron - detection instruments

Neptunium, radioactive chemical element, symbol Np; at. No. 93; at wt. 237. 0482; m.p. about 640^0C; b.p. $3,902^0$C (estimated); sp. gr. 20.25 at 20^0C; valence +3, +4, +5, or +6. Neptunium is a ductile, silvery radioactive metal. It is a member of the actinide series in group IIIb of the periodic table. Neptunium has three distinct forms (see allotropy); the orthorhombic crystalline structure occurs at room temperature. Neptunium forms numerous chemical compounds. The element was discovered in 1940 by Edwin M. McMillan and Philip H. Abelson, who produced neptunium-239 (half-life 2.3 days) by bombarding uranium with neutrons from a cyclotron at the Univ. of California at Berkeley. Neptunium, the first transuranium element, was named for the planet Neptune, which is beyond Uranus in the solar system. Neptunium is found in very small quantities in nature in association with uranium ores. There are 20 known isotopes of neptunium. Neptunium-237, the most stable, has a half-life of 2.14 million years and is used in neutron-detection equipment.

Day 1. Okay, I thought, neptunium sounds like a cool element. It's a transuranium, which gives it a certain je ne sais quoi, and it's sandwiched between uranium and plutonium - both heavy hitters in the periodic table. And it had to have been named for the Roman god of the sea : Evoke an image of a fierce Neptune, trident in hand, flowing mane of hair from a broad forehead. I don't know much, er, anything, about neptunium, but I can write 750 words on neptunium.

Day 2. Procrastinate a bit; work through a couple of items on my "Don't forget to do this" Post-it. What did I do before Post-its ? Isn't there something I forgot to put on my Post-it that I really do need to do ? No system is infallible.

Day 3. Commiserate with other C & EN staffers writing element essays. Mull possible leads, angst over illustrations, But even as I'm empathizing, I'm confident. Cocky even. I've got Neptune in my back pocket.

Day 4. Start researching. Not much in any of the reference books. Not much online either. Ther's not much to be said about neptunium, evidently. I may be in trouble. And my cockiness is gone : Neptunium was named for the planet Neptune. Drat. Wait-the planet was probably named for the god. That's stretch, though.

Day 5. No writing yet. No brilliant gestalt of the finished essay.

Day 6. Researching Neptune is not actually procrastinating. I'm finding interesting images; one might work as an illustration. Maybe I can focus on parallels between the element and the planet, making the naming of the element providential. I hope there are parallels. Found a website for a band named Neptune - a scrap metal band. The band members play instruments they made from scrap metal, and they've got photos of the instruments and the band on their site. Maybe I can tie them into neptunium as well-Nep-tune-ium ? Nope.

Day 7. Time to see what I've got :
Well, you can't find neptunium in seawater or the atmosphere, and it's now known to be present in only trace amounts in uranium ore. The only other place to find the element is in nuclear facilities or research labs.

Naptunium was the first transuranium element discovered, so as Neptune follows Uranus in the lineup of planets, Np is next to U in the periodic table. It's no surprise that plutonium is next in the actinide series.

But back to neptunium's first appearance. Working at the University of California, Berkeley, in 1940, Edwin M. McMillan bombarded a uranium target with cyclotron-produced neutrons. He noted that some unusual b rays were emitted, indicating the presence of a new isotope. Philip H. Abelson, working with McMillan, proved in May 1940 that the b-rays came from a new element. They announced their discovery in a paper published in *Physical Review* later that year. Because of national security concerns, research on neptunium continued in secret; in 1944, the first pure compund (NpO_2) was made using a few milligrams of the element. Scientists working toward a nuclear weapon found that plutonium was much better than neptunium for their purposes, so Np research moved to the back bumer.

So far, it's pretty dry going, but I've found some more interesting facts :

Sources differ on the number of isotopes neptunium has, but 17 is the most frequently given number, and they are all radioactive. McMillan and Abelson produced ^{239} Np, which has a half-life of about 2.4 days. Among the isotopes, the range of stability is amazing: ^{232} Np has a half-life of 13 minutes, whereas ^{237} Np's is 2.14 million years !

^{237}Np, a by-product of plutonium production from ^{238}U in nuclear reactors, can be used in neutron-detection instruments.

Because ^{237} Np does exist and is fissile, researchers at Los Alamos National Lab set about determining exactly how much neptunium would be required to sustain a fission chain reaction, thus to make a nuclear bomb. This quantity is called the critical mass, and in a funny coincidence, the apparatus used to conduct the experiment from which the caluculaiton is made is called the "Planet." It took 12 years to reach the point of needing the Planet, but in October 2002, LANL announced "Neptunium criticality achieved."

CRITICAL CARE *This nickel-clad neptunium sphere was used to experimentally determine the critical mass of Np at Los Alamos National Lab last year.*

So what is ^{237}Np's critical mass ? Secondary sources give it as about 60 kg; for comparison, the critical mass of ^{239}Pu is 10kkg, and ^{235}U's is 50 kg. But the ^{237}Np that's produced is not pure, and it's very difficult to separate out the pertinent isotope. Still, the International Atomic Energy Agency monitors ^{237} Np.

Day 8. Add item to my "Under no circumstances do this again" Post-it: Volunteer to take on a project without doing some research first.

Robin Giroux is C & EN's assistant managing editor for editing and production. She oversees the unit of talented editors who make sure that the stories produced by C & EN staff actually appear on page.

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How Colleagues Influence Your Creativity

by

Philip H. Abelson, Ph.D.

__Philip H. Abelson__ was editor of Science for 23 years.Currently, he is deputy editor for engineering and applied science. His scientific career spans geochemistry, physics, and molecular biology. Dr. Abelson has been awarded both the National Medal of Science and the Public Welfare Medal.

Creativity is necessarily a product of a single mind. Although a creative act may be stimulated by others, one human brain must always synthesize facts or impression. Much of the work done in research laboratories, however, requires group effort, so it makes sense to evaluate how colleagues improve or impede the creativity of individuals.

If you have worked in a group, you've probably already seen how it can hamper creativity. Animosities arise, adrenaline starts flowing, and before you know it, group members are thinking about combat instead of constructive dialogue. When it comes to behavior, we are often not that far removed from animals, and just as dogs jealously guard their turf, humans zealously protect theirs. Two people with similar capabilities, training, and equipment working on the same problem can become obsessed by rivalry.

A Matter of Group Style :

Team members work more amicably when they bring unique backgrounds, capacities, or attitudes to the group. If we reduce turf-consciousness and promote a spirit of mutual assistance, the creativity of such a group can be unleashed.

The fabulous achievements of American scientists during World War II demonstrate that success also depends on group loyalty or cohesion. Because members recognized the goals as vital and energies were focused on clear objectives, egotism was suppressed. These groups were able to achieve in a few short years what otherwise would have taken much longer.

Groups also become more cohesive when they have the prospect of profiting from success. Recently, some biotechnology firms have made exemplary achievements, prodded by the benefits they would receive from reaching their research goals.

Industrial research laboratories have begun putting such concepts of group dynamics into practice. When developing a new product, they assemble a team and assign it cost, production and marketing goals. These teams may be highly interdisciplinary-with scientists specializing, for example, in theory, materials, and process engineering. Sometimes marketing people are included. The team spirit that often develops nourishes imagination and creativity.

Another factor is the size of a research group. Although the optimum size depends on many things, five or six is often a good one. Such groups can communicate easily, but assuming members have diverse baqckgrounds, there is potential for mutual education and assistance. As the group gets bigger, friction increases, internal communication becomes tougher, and talkative people tend to dominate conversation, whether they have anything to say or not. A few large laboratories have succeeded at innovation, but in terms of creativity per person, I'd bet history has favored the smaller groups.

A Matter of Personal Style :

Personal style is another factor in creativity. An enthusiastic team member is a blessing. Many of the most constructive events in this world have been helped by enthusiasts; not only do they achieve their own, but their warmth also stimulates excitement and positive reactions in others.

Dedicated pessimists are another matter. Even if their logic is impeccable, they are to be avoided for their ability to smother creativity. To the same outbound boat I'd consign chronic complainers and vicious gossips.

Some people are natural-born loners, whose creativity can be stifled if forced into a group. If they can be creative without outside stimuli, I'd allow them to work that way. Unfortunately, both the cost of equipment and the complexity of modern problems indicate the need for teamwork, not individual effort.

Although outside stimulation can promote creativity, there's such a thing as too much of a good thing, Creative people are often better left alone, immersed in problems for as long as a week at a stretch. Shorter periods and interruptions can reduce or destroy a researcher's effectiveness. People with potential for significant creativity, in particular, should be sheltered from interruptions.

Scientist or Paper-pusher ? :

Unfortunately, when a young scientist begins getting credit for good work, the “reward” is often a heavier cargo of administrative duties, an irksome burden that can steal thinking time.

Administrative duties, committee assignments, and paperwork can also pose insoluble problems, distort the value system of the research lab, and promote another animal instinct : obsession with the pecking order. My advice : Fervently guard against interruptions, or you will see your creativity destroyed piecemeal.

In research, an optimum set of values would honor, above all else, creative solutions to specific goals. Managers who glorify nitpicking administration as the highest form of human activity may be ingenious at assigning meaningless tasks for their underlings. If they are more concerned with such anti-creative factors as the chain of command, managers will give a perverse signal to the people who invent ideas.

Thus, I think it's a mistake to use scientific creativeness as a major criterion for selecting research administrators. Many creative people are singularly inept at administration. The talent and drive that promote achievement in the lab may not help managers. An egotist who deals expertly with the inanimate world may be utterly incompetent in the realm of human interaction.

There is no simple formula to increase creativity in the R&D lab. Creativity is not something that can be tapped at will and even geniuses are truly creative only a small fraction of the time. You must be sensitive to what stimulates creativity and what stifles it. You need to be concerned with individual style and the influence of colleagues and superiors.

My hunch is that when humans discover the best means of fostering creativity - and I believe they will dramatic results will ensue.

Source :

R &D Innovator, Volume I, Number 3, October, 1992

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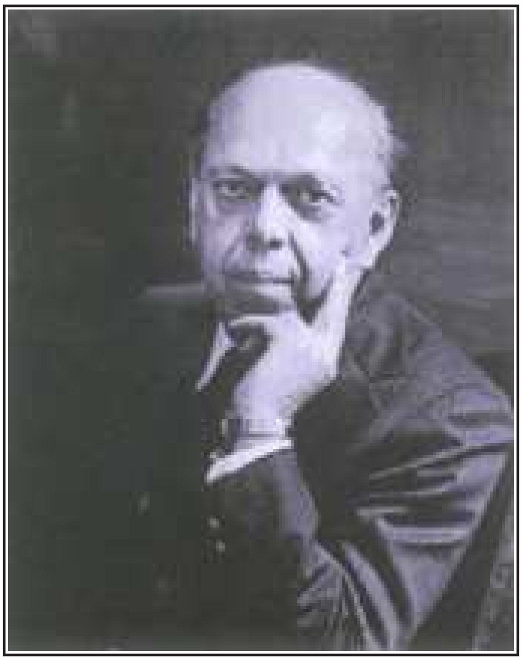
Some of the Awards Received by Philip H. Abelson



An Eclectic Scientist & Passionate Scientific Optimist

Philip H. Abelson has received many awards for his outstanding contribution to Science & Technology. Some of them are :

(1) Association of Earth Science Editors (AESE) Award for outstanding Editorial or Publishing Contributions, USA : (1976)

(2) Member, Committee on Science, Engineering and Public Policy Membership of National Academy of Sciences, USA (1962-1963)

(3) Priestley Award for Geochemical Studies - 1973

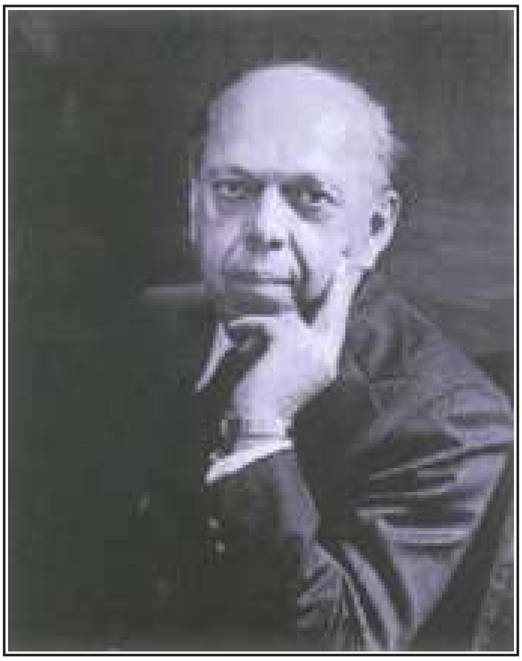
(4) National Medal of Science, USA - 1987

(5) Public Welfare Medal of National Academy of Sciences, USA - 1992.

OBITUARY

Philip Hauge Abelson

Atom Bomb Scientist and Chronicler of Scientific Advances.



Contributed By :

1. **Matt Schudel**
   Washington Post Staff Writer
   Sunday, August 8, 2004, Page C-11

2. **Jermy Pearce**
   The New York Times
   August 8, 2004

3. **Barbara Rice**
   American Association for Advancement of Science
   August 3, 2004

4. **Mary Jane Williamson**
   American Association for Advancement of Science
   October 24,2003

5. **Holland Sentinel. Com**
   August 9, 2004

6. **Chemical & Engineering News**
   August 9, 2004

Contd...

Scientist Philip Abelson Dies; Broke Ground in 4 Disciplines

By

Matt Schudel

Washington Post Staff Writer

Sunday, August 8, 2004; Page C11

Philip H. Abelson, whose early research helped lead to the development of the atomic bomb and the nuclear submarine, and who later influenced scientific thinking during 23 year as the opinionated editor of Science magazine, died Aug. 1 of pneumonia at Suburban Hospital. He was 91 and lived in Washington.

Dr. Abelson was a force in science for more than 60 years, beginning in the 1930s, when he was one of the nation's first nuclear physicists. He was the co-discoverer of the chemical element neptunium and during World War II worked on the Manhattan Project to develop the atomic bomb. Later, he was among the first to analyze the bacteria E. Coli.

His scientific expertise knew almost no bounds. Trained in chemistry and physics, he also did groundbreaking research in biology, geology, biochemistry and engineering. When he was elected to the National Academy of Sciences in 1959, he could have been admitted in any of seven disciplines. He chose to be recognized as a geologist.

Dr. Abelson published nine books on such varied subjects as microbiology, energy, food, science as well as a collection of his wide-ranging, forcefully writter essays that touched on nearly every field in the vast, expanding world of science.An article in The Washington Post in 1980 described him as a "nuclear, bio-physicist, geo-, paleo-, biochemist, microbiologist and a few other scientific compound specialties."

"He kwas an iconic figure," said John I. Brauman, a Standford University chemist who has won the Linus Pauling Award and last year was awarded the National Medal of Science. "He played many roles, and he always found a place of leadership and influence as a scientist and on the public stage."

It's hard to say whether Dr. Abelson left his strongest mark on science as a researcher or as on editor and advocate for science. He had the rare ability to do advanced work and make it understandable to ordinary people. He had several well-known public disputes .... particularly about the space program and enjoyed putting science at the center of public debate.

"He wasn't without opinions, that's for sure," Brauman said in a telephone interview from his Califomia office. "It wasn't that he enjoyed being controversial, but he enjoyed the intellectual challenges of solving problems."

Dr. Abelson first gained recognition in the 1930s as a graduate student in the celebrated laboratory of Ernest O. Lawrence at the university of California at Berkeley. In 1938, using money his mother had sent him to buy a suit, he bought aranium at a scientific supply store. Within two months, he had built a spectrometer and devised a way to isolate a fissionable form of uranium.

Abelson and future Nobel prize winner Edwin M. McMillan discogered Neptunium at Berkeley in 1940 by bombarding uranium with neutrons. Previously, there were 92 known chemical elements on Earth. Neptunium was No. 93.

Dr. Abelson then came to Washington as a physicist with the Naval Research Laboratory, where he developed a process to separate isotopes of uranium. This research was applied to development of the Laboratory in Tennessee. For his work, he received the Navy Distinguished Civilian Service Medal in 1945, the first of many honors.

In 1944, barely past his 30th birthday, Dr. Abelson was put in charge of the Naval Research laboratory in Philadelphia. Among other things, he devised a way to apply nuclear energy to locomotion. By March 1946, he had written a paper detailing how a nuclear reactor could be installed in a submarine, in effect designing the blueprint for the USS Navy's first nuclear - powered submarine.

After World War II, Dr. Abelson trurned his attention to biology and geology. His 1955 book on E. coli, which was then little known, was the standard study for decades and pointed out the bacteria's importance in the emerging field of genetic engineering.

During the 1950s, Dr. Abelson also discoverd that amino acids can survive in fossils, particularly at low temperatures, for hundreds of millions of years, a finding that would influence biochemists and the study of paleontology.

"He brought this extraordinarily astute mind to every problem he encountered," said Brauman, "whether it was with Science magazine, scientific research or social concerns."

In 1962, Dr. Abelson was named editor of Science magazine, a weekly publication of the American Association for the Advancement of Science that is read by virtually every scientist in the country. He accepted the position on the condition that he be allowed to continue his own outside research.

He made the magazine more timely and more responsive to the latest research by cultivating a network of "bird dogs" across the country to tip him off to new developments. To accommodate the latest breaking news in science, he held the section open until the day before it was shipped.

But he might have been best known for his editorials, in which he often attacked commonly accepted scientific notiions and did battle with other scientists. During the 1960s, he had a running feud with NASA Administor James E. Webb because of his implacable opposition to the manned space program, which he called a waste of time and money that did little but satisfy a sense of adventure.

Dr. Abelson opposed government regulation of science but also warned against eggheaded plans for building a genetically enhanced super race.

"Man is the product of billions of years of hard-won evolution", he told a conference in 1966. "We must not risk permitting zealots, however well-intentioned, to gamble with the future."

Philip HaugeAbelson was born in Tacoma, Wash., the son of Norwegian immigrants. He received a bachelor's degree in chemistry in 1933 and a master's degree in physics in 1935 from what is now Washington State University. He received a doctoral degree in nuclear physics from the university of California in 1939.

Fascinated with science as a boy, he became the city surveyor of Tacoma when he was 17, which helped pay his way through college.

Before he moved permanently to Washington in 1972, Dr. Abelson commuted on weekends to Philadelphia, where his family lived. His wife, Neva, was a physician who helped discover a test for the Rh factor in blood. She died in 2000, after 63 years of marriage.

"He always said my mother was smarter than he was," said Dr. Abelson's daughter, Ellen A. Cheerniavsky of Silver Spring. Two grandchildren also survive him.

Dr. Abelson developed adult-onset diabetes in his forties, prompting him to change his diet and to take up exercise. He walked or ran several miles every morning, until his health began to fail in March.

In 1987, Dr. Abelson received the National Medal of Science. He belonged to numerous scientific societies and received dozens of prestigious awards, including the Kalinga Prize from the Untited Nations Educational, Scientific and Cultural Organization and the Distinguished Public Service Award from National Science Foundation. Affiliated with Carnegie Institution since 1939, he was its president from 1971 to 1978. He received seven honorary degrees.

"He was a very revered figure," said Donald E. Koshland Jr., who succeeded Dr. Abelson as editor of Science. "People knew he had total integrity."

When Dr. Abelson became editor of Science in 1962, it had a circulation of 75,000. By the time the retired at the end of 1984, the circulation was 55,000. Dr Abelson held many advisory roles with science foundations and stayed on as a contributing editor for Science, writing occasional editorials until the late 1990s. A collection of 100 of his editorials was published in 1985 as "Enough of Pessimism."

'I don't mind people getting mad at Phil Abelson," he once said about his strongly worded opinions, "but I don't want them to get mad at Science or science."

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Philip Abelson

Chronicler of Scientific Advances, Dies at 91

By JEREMY PEARCE, The New York Times
Published : August 8, 2004

Philip H. Abelson, a versatile scientist, editor and administrator who helped discover the element neptunium and later chronicled laboratory advances as editor of the journal Science, died on Aug. 1 in Bethesda, Md. He was 91.

The cause was pneumonia, said a nephew, Dr. John N. Abelson, emeritus professor of biology at the California Institute of Technology, who is at work on a biography of his uncle.

Dr. Abelson's interests spanned chemistry, geology biology and medicine, but it was as a physicist that he aided in the discovery of neptunium, the 93rd element in the periodic table, in 1940. Neptunium is a metal and a byproduct of uranium. He worked with Edwin M. McMillan, who shared the Nobel Prize for Chemistry in 1951 with Glenn T. Seaborg for their contributions in describing neptunium, plutonium and other transuranium elements.

During World War II, Dr. Abelson continued his nuclear studies at the Naval Research Laboratory, exploring methods to split uranium isotopes in work that was later used in the design of nuclear-powered submarines. Earlier, in 1939, he joined the Carnegie Institution of Washington, eventually rising to become the institution's president from 1971 to 1978.

In 1962, Dr. Abelson embarked on a different aspect of his career when he became the editor of Science, a post he held for more than two decades, until 1982. He wrote more than 500 editorials on subjects that ranged from medical research to national energy policies, and contributed to the journal until recently.

Philip Hauge Abelson was born on April 27, 1913, in Tacoma, Wash. He earned an undergraduate degree in chemistry and a maser's degree in physics from Washington State College. In 1939, he received a doctorate in nuclear physics from the University of California, Berkeley, where he met Dr. McMillan. He served three times as acting executive diretor for the American Association for the Advancement of Science, in 1974, 1975 and 1984.

Dr. Abelson was awarded the National Medal of Science in 1987. He was a member of the National Academy of Sciences and was given its public welfare medal. He won the National Science Foundation's Vannevar Bush public service award in 1984. Dr. Abelson also received honorary degrees from Yale, Tufts and Duke.

His wife, Dr. Neva Martin Abelson, a professor of pediatrics at the Univeristy of Pennsylvania, died in 2000. The couple had resided in Washington.

Dr. Abelson is survived by his daughter, Dr. Ellen A. Cherniavsky of Silver Spring, Md.; his nephew, of San Francisco; and two grandchildren.

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Philip H. Abelson
World-Renowned Scientist, Dies at Age 91

By Barbara Rice
American Association for Advancement of Science (AAAS)
3 August 2004

Philip H. Abelson, Ph. D., accomplished scientist and former Science editor, died on 1 August at Suburban Hospital in Bethesda, Maryland. He was 91. His work and contributions spanned more than 40 years with the American Association for the Advancement of Science. His positions of leadership and his service on many national advisory committees enabled him to shape national science and technology policy.

"Dr. Abelson, a true icon in the scientific community, took the journal Science to a new level of quality and prominence during his 22-year tenure, " said Alan I. Leshner, AAAS CEO and executive publisher of Science. "After he stepped down as editor in 1984, he remained an active contributor to the journal and adviser to AAAS, pursuing his passion for science and research, often at the forefront of scientific discovery. A mentor and friend to many of us, Dr. Abelson sought creative ways to overcome any barrier in the path to progress. One of his favority sayings was, **'Tough times never last, but tough people do'."**

Philip Hauge Abelson, born 27 April 1913, in Tacoma, earned both his bachelor's degree in chemistry and his master's degree in physics at Washington State College. In 1935, he began his career as a young physicist at the University of California at Berkeley, performing early nuclear research in "The Radiation Laboratory," known today as the Ernest Orlando Lawrence Berkeley National Laboraroty. In 1939, he obtained his Ph. D degree in nuclear physics. The following year, he and Edwin McMillan discovered the first transuranic element, neptunium. In 1941 he joined the Naval Research Laboratory (NRL) in Washington, D.C. where he developed a liquid thermal diffusion process, which was used as an initial step in enriching uranium for the first atomic bomb.

Apart from the war yeas at NRL, he spent 34 years at the Carnagie Institution of Washington. He first came to the city in 1939 to work on cyclotron development as an assistant physicist in Carnegie's Department of Terrestrial magnetism. In 1941 he transferred to NRL to work on defense projects, on a leave of absence form Carnegie, where he returned to head the Department's biophysics section from 1946 until 1953. In 1953 he became director of the Geophysical Laboratory and was Carnegie's president form 1971 to 1978. During this time, he also extended the important work of Stanley Miller on the origin of vital biological molecules. From 1962 until 1984, he was the editor of Science, published by AAAS. He continued his association with Science and at the same time was a senior adviser to AAAS until his kdeath. At AAAS, he also served as its acting executive officer in 974, 1975 and 1984.

"His own editorials were clear, rich with content, and sometimes angry," said Donald Kennedy, editor-in-chief of Science, in a tribute he wrote (Science, 6 August 2004). "He didn't like government regulation much, particularly when it involved regulation of science, and when I was at the Food and Drug

Administration doing some of that, his editorials occasionally made me wince. But his arguments were honest, asking only to be judged on their merits. The last paragraph of one of his editorials, written in 1976 when society was concerned about the unanticipated risks associated with new technologies, is revealing. After surveying the cost benefit pendulum of innovation, he comes down against the pessimists : “One would not advocate that we become a nation of Panglosses. However, enough of pessimism. It leads nowhere but to paralysis and decay’.”

Among his scientific accomplishments, Dr. Abelson was perhaps best known for his co-discovery of neptunium (element 93) and a method he devised for large-scale enrichment of uranium for use as a power source in submarines, leading to the construction of the world’s first atomic submarine. As editor of Science, he implemented more efficient peer-review procedures for scientific papers and encouraged a more active style of science reporting that included broader coverage of science and policy issues.He wrote some 600 editorials addressing public debates over scientific research, including AIDS, technology and energy policy. In 2001 and 2002, he gave his scientific papers to the Library of Congress.

Dr. Abelson credited his father, a civil engineer, with giving him an insatiable appetite for information. He subscribed to a host of scientific journals, scanning them everyday for information worthy of further study. He maintained academic vigor through strict self discipline, and his work was wide ranging, with contributions made in chemistry, physics, biochemistry, geophysics and medicine. His life-long interests were reflected in his orgtanization of AAAS’s annual Advancing Science Seminar series, the last of which examined innovative technologies that show promise in delaying the diseases of aging, and in diagnosing and treating cancer, heart disease, and neurodegenerative diseases. Dr. Abelson governed his daily life through simple, practical guidelines that included a regimen of exercise and proper diet.

Nationally, Dr. Abelson has been honored with many major awards. During his lifetime, he received the president’s National Medal of Science; the Vannevar Bush Distinguished Public Service Award from the National Science Foundation, its highest honor; the Distinguished Civilian Service Medal; the **Kalinga Prize for the Popularzationof Science from UNESCO;** the Science Achievement Award from the the American Medical Association; and the Public Welfare Medal of the National Academy of Sciences, its most prestigious award. In his honor, AAAS established the Philip Hauge Abelson Prize in 1985 to recognize an individual for his or her scientific achievement, public service, or service to the scientific community.

Dr. Abelson is survived by his daughter, Dr. Ellen A. Cherniavsky, a senior engineer in the Center for Advanced Aviation System Development with MITRE Corp. His wife, Neva, had an outstanding career as a doctor. She was one of the first women to graduate with a medical degree from Johns Hopkins University and is most noted as the co-developer of a crucial test for the Rh factor in blood. She died in 2000.

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Philip H. Abelson

Editor of 'Science' from 1962 to 1994
&
Father of the Atomic Submarine

Scientific Community Honors
Scientist With Deep Roots in Science,
American Association for the Advancemnet of Science (AAAS)

by
Mary Jane Williamson
24 October 2003

For the last 70 years, Philip H. Abelson, editor emeritus of the AAAS journal, Science, has pursued his passion for science and scientific research, often at the forefront of scientific discovery. His significant contributions, including 22 years as editor of Science were recognized furing a symposium and dinner held October 21 at the Carnegie Institution, Washington, D.C.

Alan I. Leshner, AAAS CEO and Executive Publisher of Science, underscored the significance of Abelson's contributions to science. "Philip Abelson has been with AAAS for over 40 years," Leshner told a group of more than 50 of Abelson's family colleagues and admirers. "During his tenure as editor of Science, he took the journal to a new level of quality and prominence. " According to Leshner, although Abelson's career is a long and distinguished one, "Phil only looks to the future. He is always looking to, and beyond, the leading edge of science and scientific research."

Nowhere is this more evident than in Abelson's organization of the AAAS's annual Advancing Science Seminar series. This year's seminar, Technology and the Promise of Health, held October 14, examined innovative technologies that show promise in delaying the diseases of aging, and in diagnosing and treating caner, heart disease, and neurodegenerative diseases.

Abelson was a prominent player in shaping national science policy. He began his career in 1935 when he joined Ernest Lawrence's laboratory at Berkeley where he was the first to characterize fission products. In 1940, Abelson, along with Edwin McMillan, discovered the first transuranic element, neptunium. His liquid thermal diffusion process, developed at the Naval Research laboratory in Washington, D.C., was used as an initial step in enriching uranium for the first atomic bomb. After World War II, Abelson worked for several years with the Navy to adapt nuclear reactors for use as power plants in submarines, earning him the title of "father of the atomic submarine."

From 1962 to 1984 Abelson was editor of Science and from 1971 to 1978 he also served as President of the Carnegie Institution. Nationally, Abelson has been honored with many major awards. He is a recipient of the President's National Medal of Science, the Vannevar Bush Distinguished Public Service Award from the National Science Foundation, its highest honor; and the Science Achievement Award from the American Medical Association. In 1945, he received the Distinguished Civilian Service Medal.

The Symposium & dinner, sponsored by the Agouron Institute & Co-ordinated by Abelson's nephew, Agouron's President John Abelson, paid homage to all that Abelson has accomplished in his ninety years. His life-long interests-in physics, chemistry, geology and biology-were reflected in the presentations of speakers at the symposium; their topics ranged from genetics to geology.

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The Holland online Sentinel Local Sports
Scientist, Editor Abelson Dies
Monday August 9, 2004

WASHINGTON.... Philip H. Abelson, whose early research helped lead to the development of the atomic bomb and the nuclear submarine, and who later influenced scientific thinking during 23 years as the opinionated editor of Science magazine, died Aug. 1 of pneumonia. He was 91 and lived in Washington.

Abelson was the co-discoverer of the chemical element neptunium and during World War II worked on the Manhattan Project. Later, he was among the first to analyze the bacteria E.Coli.

....Sentinel wire reports

His scientific expertise knew almost no bounds. Trained in chemistry and physics, he also did groundbreaking research in biology, geology, biochemistry and engineering. When he was elected to the National Academy of Sciences in 1959, he could have been admitted in any of seven disciplines. He chose to be recognized as a geologist.

Abelson published nine books on such varied subjects as microbiology, energy, food, electronics, health care and earth science - as well as a collection of his wide-ranging, forcefully written essays that touched on nearly every field in the vast, expanding world of science. An article in The Washington Post in 1980 described him as a “nuclear, geo-, bio-physicist, geo-, paleo-, biochemist, microbiologist and a few other scientific compound specialties.”

“He was an iconic figure,” said John I. Brauman, a Stanford University chemist who has won the Linus Pauling Award and last year was awarded the National Medal of Science. “He played many roles, and he always found a place of leadership and influence as a scientist and on the public stage.”

It’s hard to say whether Abelson left his strongest mark on science as a researcher or as an editor and advocate for science. He had the rare ability to do advanced work and make it understandable to ordinary people. He had several well-known public disputes ... particularly about the space program .... and enjoyed putting science at the center of public debate.

“He was n’t without opinions, that’s for sure,” Brauman said in a telephone interview. “It wasn’t that he enjoyed being controversial, but he enjoyed the intellectual challenges of solving problems.”

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After World War II, Abelson turned his attention to biology and geology. His 1955 book on E. Coli, which was then little known, was the standard study for decades and pointed out the bacteria's importance in the emerging field of genetic engineering.

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Before he moved permanently to Washington in 1972, Abelson commuted on weekends to Philadelphia, where his family lived. His wife, Neva, was a physician who helped discover a test for the Rh factor in blood. She died in 2000, after 63 years of marriage.

"He always said my mother was smarter than he was," said Abelson's daughter, Ellen A. Cherniavsky of Silver Spring, Md. Two grandchildren also survive him.

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CHEMICAL & ENGINEERING NEWS
August 9, 2004

Philip Abelson Dies At 91

Noted Physicist, Chemist, and Former Science Editor Who Shaped Science and Policy

By
RACHEL SHEREMETA PEPLING

Philip H. Abelson, 91, longtime editor of 'Science' and codiscoverer of the element neptunium, died from pneumonia on Aug. 1.

Abelson served as editor of Science from 1962 until 1984. He often addressed science and policy issues through his editorials. After his tenure as editor, he maintained close ties with Science as a contributor and with the Association for the Advancement of Science as a senior adviser.

Born in Tacoma, Wash., Abelson received a bachelor's degree in chemistry and a master's degree in physics from Washington State University. In 1939, he received a Ph.D degree in nuclear physics from the University of California, Berkeley.

After receiving his Ph. D., Abelson worked with Edwin M. McMillan at UC Berkeley, bombarding uranium with neutrons. The two men are credited with the discovery of the first transuranic element, neptunium, in 1940. Abelson then joined the Naval Research Laboratory in Washington, D.C. in 1941, where he developed a liquid thermal diffusion process. That process enabled the large-scale enrichment of uranium and led to the development of the first atomic submarine.

In 1953, Abelson became director of the Carnegie Institution of Washington's Geophysical laboraroty. He then served as Carnegie institution president from 1971 to 1978.

Among his honors and awards, Abelson received the President's National Medal of Science (1987), the Distinguished Civilian Service Medal (1985), the Vannevar Bush Distinguished Public Service Award from the National Science Foundation (1984), **and the Kalinga Prize for the Popularization of Science from UNESCO (1972).**

Abelson is survived by his daughter, Ellen A. Cherniavsky. His wife, Neva, died in 2000.

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GEOTIMES

October 2004

In Memoriam :
Philip Hauge Abelson

By

Brooks Hanson

Deputy Editor for the Physical Sciences at Science in Washington, D.C.

Philip Hauge Abelson passed away on Aug. 1 at the age of 91. Although some of his early work in physics is most often recognized, when forced to choose, he considered himself a geologist. From the age of 30, Abelson never was satisfied working one job in one field. He was an interdisciplinary researcher, director, president, editor and writer - and avid walker and gardener just to fill out the day.

An eclectic scientist and passionate scientific optimist, Abelson was concerned and involved with encouraging scientists and interdisciplinary science and with making science work for society. He fostered these interests and goals while serving as director of the Naval Reserch Laboratory in Philadelphia in 1944, the Geophysical laboratory from 1953 to 1971 and the Carnegie Institution of Washington from 1971 until 1978, as well as president of the American Geophysical Union. From 1962 until 1983, he also was the editor of Science. he continued to serve on the Science editorial board, and was an adviser to other boards interfacing between science and society.

After earning degress at Washington State Univesity in chemistry and physics, Abelson conducted graduate work in nuclear physics at the University of California, Berkeley. Continuing a collaboration that began there, Abelson and Edwin McMillan created the first artificial element, neptunium and had tantalizing hints of plutonium. Working independently, he developed an approach that was used in part to produce the material for the first atomic bomb. He then helped conceive and initiate the nuclear submarine program.

His time at the Geophysical Laboratory, first in 1939 and then again in 1946, fostered his work on biology and geology, and the connections between these and other fields. While at the lab, Abelson began prescient studies of E.coli (writing a book that presaged the microbe's significance in microbilogy) and finding and exploring the significance of amino acids in fossils (presaging the field of biogeochemistry). He also helped foster the careers of scientists from around the world by inviting them to work at Carnegie.

A survey of Abeson's many editorials at 'Science' reveals a deep concern for the connection between science and social good, for pushing scientists, their societies, and governments to work better, as well as relishing in scientific advances.