

## **2 COMPOUNDS SEEN AS AID IN RADIOACTIVITY**

Treatment with two compounds can remove most of the radioactive plutonium deposited in the bodies of persons who process used uranium, Dr. Jack Schubert, senior chemist at the Argonne National laboratory, said Monday.

They are two metal grasping substances known as DTPA and BAETA. They sequester or trap metal ions to form a stable, water soluble complex which then is eliminated from the body by normal elimination processes. Neither compound is poisonous to humans.

yesterday for contempt of court.

## CHEMICALS REMOVE PLUTONIUM IN BODY

LEMONT, Ill. — Two metal-grasping compounds capable of removing highly radioactive plutonium from the body have been found.

They are effective in removing the plutonium even several days after the dangerous metal has entered the body, Dr. Jack Schubert, chemist at Argonne National Laboratory, reported here.

In one experiment, he said, rats were given a single injection of one of the two chemicals, DTPA or BAETA, six days after exposure to plutonium. Within twenty-four hours the rats excreted more than 5 per cent of the plutonium retained in their bodies. This is about 150 times as much as would normally have been eliminated.

This is the first reported use of BAETA to remove plutonium. However, DTPA has been used to remove cerium, another heavy metal, from the body. Both compounds are agents that trap metal ions to form a stable, water soluble complex that is relatively inert chemically. Neither is poisonous to man.

Clearer Ties Sought by 2 Facts

# Bikini's Mud Still Radioactive Year After Underwater Blast

By ROBERT GRAHAM

Deadly radioactivity loosed in atom bomb blast "Baker" still lurks under the surface waters of Bikini lagoon, more than a year after the lush tropical atoll was exploded from its Pacific obscurity into the pages of history.

Although dissipated by time and ocean currents so that men swam this summer in waters that last July boiled in the flash of atomic fission, radioactivity continues to make the coral island untenable to man with absolute safety for long periods of time.

This is the initial picture of Bikini as seen by two scientists who have just returned by plane from "Operation Cross-check," the year-after re-survey of the A-bomb tests' target area conducted by the Atomic Energy Commission, the Navy and War Departments and several other scientific institutions.

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# Bikini's Mud Still Radioactive Year After Underwater Blast

(Continued from First Page)

The youthful pair of nuclear chemists, both research associates at the Massachusetts Institute of Technology, are Lawrence E. Glendenin of Watertown and Raymond R. Edwards of Arlington, who were in charge of the instruments used to check the amount and type of radioactivity in the Bikini area.

After working six weeks under the scorching Pacific sun, analyzing hundreds of items, ranging from the ash of wierdly colored fish to slime, they arrived here for Labor Day week-end nearly two weeks ahead of the USS Chilton, floating laboratory bringing back the bulk of expedition's scientific staff, numbering some 82 men.

They found alpha rays from radioactive plutonimu and beta rays, released in the act of nuclear fission, in dangerous quantities deep in the mud 180 feet below the center of the underwater A-bomb explosion.

## FISH STILL AFFECTED

The hulls of the fighting ships sunk in the test were found to be still "hot." Even the fish in the area were discovered to be radioactive, although the fish had not appeared to have absorbed enough radioactivity to affect them.

Nevertheless, the Navy prohibited the men from eating any fish caught in the area, although fishing was a favorite form of diversion.

In contrast, surface water in the lagoon, which is refreshed almost completely with sea water every 22 days, were discovered to be safe for swimming, while nothing on Bikini atoll itself suffered any long range effects from either bomb blast Able or Baker. The steam cloud from the underwater explosion, however, did not pass over the island.

Coconuts grew in profusion, and a puppy, later named "Plutonia," which was abandoned on the island a year ago, survived his hermitage there, eating crabs, clams and mice.

At first wild and wary, the little female terrier succumbed to the Seabees who caught her, via a ham bone lure, and she became the "Cross-check" mascot. Tests disclosed she absorbed no radioactivity.

## SURFACE CALM DECEPTIVE

The surface calm of the atoll, described by one of the staff as "a bathtub with a fan (the trade-wind) at one end," was completely deceptive. Even Judah, head man of the island tribe dispossessed from Bikini to make "Operation Crossroads" possible, could see no change in his native home.

He and three of his aboriginal lieutenants were called in by the scientists as an aid to the re-survey to ascertain if their practiced eyes could note any changes in their homeland, the waters about it or the fish, their main diet.

Although everything looked to Judah as if he could move his tribe back immediately, the scientists knew better.

The radioactivity that sank into the mud was made harmless only by the shield of water that protected it. But from the mud, algae,

the lowest form of sea life with a strong resistance to radioactivity, passed the phenomena on to fish who ate them. Similarly, fish eating barnacles and marine plant life that encrusted the battered battleships also became radioactive.

## THOUSANDS OF FISH TESTED

Thousands of fish were caught and analyzed organ by organ, and their livers were found to contain active beta rays equivalent to five times the amount showered on the earth by cosmic rays. The atomic detectives, however, were relieved to find that the more deadly alpha rays from plutonium showed negligible concentration in marine life. Also outside the lagoon signs of radioactivity in fish decreased markedly.

Divers, including L. M. Lroux of Southbridge, who descended to the hulls of the Saratoga and the submarine Pilot Fish, utilized underwater television for the first time, and it worked, although the light was poor.

With that arrested motion typical of divers far below the water, Lroux, incidently, made a pet of a five-foot barracuda, perhaps the most vicious killer that swims.

Although initially more fearful of the barracuda than the lethal radioactivity he was checking, the Southbridge diver soon was feeding the fish that waited for him every day and followed him yards from the Saratoga to the Pilot Fish.

## CORAL STILL MYSTERY

The mystery of the origin of coral atolls like Bikini was still a mystery when the expedition sailed away, despite the fact that drillers from the Oklahoma oil fields probed a half-mile down into the precipitous marine mountain for geologists of the U. S. Geological Survey.

One hundred and ten years ago, Charles Darwin, famous British naturalist, advanced the theory that coral reefs were formed by coral, dead sea animals, growing upwards from slowly-sinking volcanic islands. Since then, an argument has raged across the scientific world pro and con.

The "Cross-check" drillers, in efforts to end the dispute, bored to a record depth, but unearthed nothing but more coral. Finding the atoll's foundation so unstable, Capt. Christian L. Engleman, USN, project officer, declared: "I'm surprised the underwater atomic bomb explosion, a severe storm or some minor earthquake hasn't pushed Bikini right off into the sea."

Over-all technical director of the radioactivity tests for the expedition was Comdr. E. S. Gilfillan, USNR, of Manchester.

## NURSES TO HEAR PRELATE

Archbishop Cushing will speak at the annual Communion breakfast of the Carney Hospital Nurses Alumnae this morning at the Hotel Statler. High mass will be celebrated in the chapel of Carney Hospital preceding the breakfast at 8:30 o'clock it was announced by Rita M. Sullivan, R. N., chairman.



ABC AVERAGE NET CIRCULATION FOR THE } 552,426 DAILY  
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Pulitzer gold medals awarded the Daily News for "most disinterested and meritorious public service" in 1956 and 1949. The award for 1956 is the 10th Pulitzer Prize received by the Daily News or members of its staff since 1925.

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## FEAR OF THE UNKNOWN

# Atomic Fallout Hearings Show Conflict of Views

**IN THE ABSENCE** of any international agreement to ban nuclear explosions, it is the fear of the unknown that remains the most tangible substance in the fallout from atomic weapons tests.

Hearings before a joint congressional subcommittee on atomic energy last week produced evidence that there is a record amount of radioactive debris in the atmosphere.

The Atomic Energy Commission disclosed that since 1945 the United States, Russia and Great Britain have exploded nuclear weapons with a total fission yield of 90,460 kilotons. (A kiloton is the equivalent of 1,000 tons of TNT.)

In a breakdown of these figures, it was also disclosed that of this amount, a total fission yield of 40,000 kilotons was released in the 1957-1958 period alone.

**IT WAS THE** latter disclosure that seemed most to interest Rep. Hollifield (D., Calif.), chairman of the subcommittee, who noted that this fission yield far exceeded the safety limit of 10,000 kilotons annually, which was recommended by scientists at the 1957 hearings of the subcommittee. It is the fission process in explosions that releases radioactive strontium 90 and other substances.

This report was followed a day later by a more reassuring assessment of fallout perils by the nine-member AEC advisory committee headed by Warren C. Johnson, vice-president of the University of Chicago. The total radioactivity to date, said the group, is less than 5 per cent of that released by medical X-ray machines and the hazard is slight.

There were other significant disclosures at the hearing. One was an accumulation of evidence that fallout seems to be concentrating in the Northern Hemisphere.

Another was a warning that fallout would rise to dangerous levels if atomic

testing should be resumed at the intensive rate of the last five years.

This warning came from Dr. Wright Langham, a Los Alamos specialist, who nevertheless added that fallout from the tests to date would stay within the maximum permissible levels as determined by the National Committee on Radiation Protection and Measurements.

**DR. JAMES F. CROW**, University of Wisconsin geneticist, also warned that if testing is continued at the present rate "it is likely that tens or hundreds of thousands or more persons will be diseased, or deformed, or die prematurely."

Dr. Jack Schubert, a chemist at the Argonne National Laboratory, said "it is prudent to assume" that children's cancer deaths will increase as the fallout increases.

There were other reports also that were not so reassuring.

**Dr. Charles L. Dunham**, director of the AEC's division of biology and medicine, reported the possibility that radiation so far released could produce 50 to 100 additional cases of bone cancer a year over the next 70 years. Radiation - induced leukemia might double those figures, he added.

E. B. Lewis, a biologist from the California Institute of Technology, estimated that "some" children—anywhere from 80 to 1,600—may develop thyroid tumors from exposure to radioiodine released in the tests over the last five years.

It will not comfort everybody that Dr. C. L. Comar of Cornell University was telling the subcommittee that a mother can, by breast feeding, reduce her baby's intake of strontium 90 to about 10 per cent of the amount it would get from cow's milk.

Most of us, it happens, are already weaned.

# Formula Found to Rid Body of Plutonium

Two compounds that grasp metal atoms in octopus-like tentacles are proving effective in ridding the body of radioactive plutonium.

Scientists at Argonne National Laboratory report that the compounds are effective in flushing plutonium from the bodies of laboratory animals and say the treatment should prove equally effective in men.

The metal-grasping substances, known as DTPA and BAETA, have a large number of molecular claws, so arranged that the plutonium atom is imprisoned within a molecular cage from which escape is almost impossible.

## REACTOR FUEL

Plutonium is a man-made radioactive element not occurring in nature. So far, it has been used chiefly in atomic weapons but is now being used more widely as a fuel for atomic reactors.

It can be breathed into the body or find entrance through a scratch on the skin. It is estimated that amounts no larger than a flyspeck could give rise to cancer, were the plutonium left within the body.

So far, said Dr. Jack Schubert, who headed the Argonne research team reporting the finding, only a few people have been exposed to plutonium poisoning but it is a potential hazard for those who work around reactors or in government laboratories such as that at Los Alamos.

CHICAGO DAILY NEWS, Tues., Dec. 16, '58

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## ARGONNE DISCOVERY

# Remove Plutonium From Lab Animals

Plutonium, a highly radioactive element used in production of atomic weapons and atomic fuel, can be eliminated from tissues of laboratory animals even when treatment is delayed.

This hopeful announcement from Argonne National Laboratory said two compounds, DTPA and BAETA, are capable of imprisoning the plutonium atom in a "molecular cage" from which escape is nearly impossible.

**DR. JACK SCHUBERT**, senior chemist at Argonne, said:

"Until recently, we have had little success in removing appreciable amounts of plutonium which have been retained in the tissues for several days."

While the study has been largely limited to animals, Dr. Schubert expressed confidence the drugs could do the same for man.

He added, however, that no effect on the elimination of the fallout radioactive isotope strontium-90 can be expected with DTPA and BAETA.

The peril of strontium, which settles in the bone, remains unchallenged by any drug.

## Two Scientists Disagree on Peril from Fallout

Two scientists from the Argonne national laboratory disagreed last night on the degree of danger inherent in fallout from nuclear bomb testing, or radiation from the production of nuclear power.

They are Dr. Jack Schubert, senior chemist, and Dr. William P. Norris, associate biochemist at the laboratory. They spoke in the Unitarian church of Evanston, 1405 Chicago av., in one of a series of programs sponsored by the

congressional district who show talent in scientific fields.

Martin said in a statement the students could be selected by competitive examinations. Appointments would be made by the health-education-welfare department and the students assigned to scientific universities and research institutions.

### Sputniks Provide Stimulus

Martin said that encouraging youths to enter science "would not only be helpful in continuing our supremacy in the missile field, but also would contribute materially to our industrial leadership in the new atomic age." He said that altho the noncommunist world has nothing to fear "at this time" from the Russian satellites, the launching of the satellites must be a stimulus to concentrate more intensively on research and development programs in the sciences.

church's adult education committee.

Dr. Schubert said that the effects of radioactive fallout may be more serious than is generally believed, and noted an amazing unanimity on the part of government experts in minimizing such effects.

"Those who differ are not reappointed by the government," he said.

He also commented on possible dangers in the disposal of radioactive wastes and noted that Great Britain has been dumping such wastes into the ocean. He suggested that the only safe disposal of such material might be to shoot it at the moon.

### Finds No Evidence

Dr. Norris said there has been no evidence thus far to show that radioactive fallout has any significant effect on populations.

He added that it will be up to the public of tomorrow to put radioactive fallout dangers in proper perspective. He noted that both automobiles and tobacco have been assailed as hazards to life, but that neither has been abolished.

He expressed the opinion that the present concentration of radioactive materials in the upper atmosphere as the result of bomb testing is far below that which might be considered dangerous to individuals.

A PARK AAGUS  
JAN 20, 1957

## Radiation, Fallout

# Atom Expert Plans Civil Defense Talks

The Elmhurst civil defense organization will present lectures on atomic radiation by Dr. Jack Schubert, of Argonne National Laboratory, to a group of specially qualified persons.

Local civil defense personnel; scientists, doctors and nurses at Memorial hospital; and science teachers of the elementary and parochial schools and colleges will hear "Fallout and the Role of Civil Defense Personnel," Jan. 29, and "Peacetime Radiation Hazards," Feb. 5, at 8 p.m., in the Elmhurst city hall.

Dr. Schubert, a biologist and chemist, is the co-author with Dr. Ralph Lapp of the book "Radiation, What It Is and How It Affects You." An authority on radiation, he recently gave his views on a television program.

His writings have appeared in most of the leading scientific journals. Dr. Schubert is a fellow of the American Academy for the Advancement of Science, and fellow of the New York Academy of Sciences, and was a United States delegate at the 1955 Geneva "Atoms for Peace" conference.

n. y. ? Herald Tribune 11-24-51

# Animals Cured Of Beryllium Poison in Test

## Atom Expert Says Antidote Was 'Nearly Perfect' and Gave Advance Protection

CHICAGO, Nov. 23 (AP). — An atomic scientist announced today successful use on experimental animals of the first antidote ever found for dread beryllium poisoning.

Beryllium is a metal used in industry and research. It formerly was used in fluorescent lighting. It is one source of radioactivity in the nation's atomic energy program. The metal is under investigation as a possible construction material for atomic piles.

Tiny amounts of the metal deposited in the human body through a wound or by inhalation cause an insidious, slowly developing disease for which no cure has been found. Although the drug ACTH brings marked temporary improvement, the disease sometimes is fatal.

### Not Yet Tried on Humans

Dr. Jack Schubert of the Atomic Energy Commission's Argonne National Laboratory in Chicago tried the antidote, a compound known as ATA, on animals. It has not yet been tried on humans.

In a report to the Chicago section of the American Chemical Society Dr. Schubert said ATA proved to be a "nearly perfect antidote" for otherwise fatal doses of beryllium compounds. He added that ATA also gives protection when administered to animals before exposure to the metal.

Wounds heal faster when certain sulphur compounds are included in the diet, Dr. Martin B. Williamson told the same meeting today. The associate professor of biochemistry at the Loyola University School of Medicine said these sulphur amino acids are found in the proteins of eggs, milk, wheat, corn and some other foods.

He asserted that his finding throws new light on earlier discoveries that a high protein diet speeds healing. Tests on experimental animals showed their wound-healing rate was much more rapid on high protein diets

### Sulphur Acid Added

However, further experiments showed the addition of a sulphur amino acid to the low protein diet produced nearly the same healing speed as the high protein diet. He said this indicated that it was the sulphur compounds and not the protein diet that speeded healing.

Dr. Bernard Wolnak, of the Miner Laboratories, Chicago, reported that the production of alcohol from sugar can be speeded by a new vitamin-like material found in the by-products of sewage purification systems. The fermentation factor is obtained from dried activated sludge, used heretofore only as a fertilizer.

Dr. Wolnak told the conference the discovery should increase the capacity of alcohol plants since there are indications the factor permits the production of more alcohol from a given amount of sugar.



## Find Antidote For Poisoning By Beryllium

The successful use on animals of the first antidote ever found for beryllium poisoning was announced Friday by Dr. Jack Schubert of the Atomic Energy Commission's Argonne National Laboratory here.

Beryllium, a metal used in industry and research, is one source of radioactivity in the nation's atomic energy program.

Tiny amounts of beryllium which enter the human body through a wound or by inhalation cause a slowly developing disease for which no cure has been found. The drug ACTH has brought marked temporary improvement to some victims but the disease sometimes is fatal.

Dr. Schubert told the Chicago section of the American Chemical Society that a compound known as ATA has proved to be a "nearly perfect antidote" for otherwise fatal doses of beryllium.

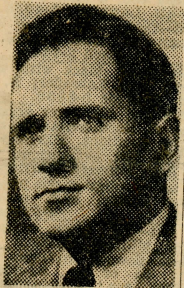
Schubert reported that ATA gives protection also when administered to animals before they are exposed to effects of the metal. It has not been tested on humans.

Chicago Tribune 11-24-51

## FINDS ANTIDOTE FOR BERYLLIUM'S DEADLY POISON

### Discovery Will Help Atomic Workers

The first successful antidote for beryllium poisoning, a slow and deadly ailment which has struck several workers on atomic energy projects, was reported yesterday by a research expert of the Argonne National laboratory.



Dr. Schubert

Dr. Jack Schubert revealed that the antidote, which, when injected into the body, combines with beryllium to render it harmless, has proved effective in experiments on animals. He told of his findings at a meeting of the Chicago section of the American Chemical Society in the Illinois Institute of Technology.

Strangely, the antidote is a substance which has been employed by scientists for years in the original detection and chemical analysis of beryllium. Dr.

Dr. Schubert said that although many patients have shown marked improvement after treatment with the anti-arthritis drug known as ACTH, no cure for the poisoning has yet been found. He expressed hope that ATA, alone or in combination with ACTH, may prove effective, but emphasized that much research still remains to be done before ATA can be tried on human beings.

N. Y. Times

Nov 23 1951

## SCIENTIST REPORTS BERYLLIUM ANTIDOTE

Special to THE NEW YORK TIMES.

CHICAGO, Nov. 23—What may be the first successful antidote for beryllium poisoning was reported today to the American Chemical Society by Dr. Jack Schubert of the Argonne National Laboratory of the Atomic Energy Commission. Tests on laboratory animals, Dr. Schubert said, indicate that the antidote should be successful in treating human beryllium poisoning.

The compound, known as ATA, for aurin tricarboxylic acid, was determined to be effective in animal experiments by Dr. Schubert, Marcia R. White, Asher J. Kinkel and Arthur Lindenbaum, all of the laboratory.

Beryllium, a durable, light weight metal, formerly was widely used in fluorescent lamps. It now is employed as a source of radioactivity for atomic energy and is under investigation as a possible material for atomic piles.

Recently, Dr. Schubert reported, it had been recognized that the metal causes a slowly developing disease that is frequently fatal. In a few cases, beryllium poisoning has followed accidental cuts from broken fluorescent tubes. Tubes manufactured today do not contain beryllium.

ATA apparently inactivates beryllium in the animal body by forming an inactive and nontoxic substance.

**ATOMIC ENERGY AIDES AFFECTED**

# ***Beryllium Poisoning Antidote Reported***

**BY ARTHUR J. SNIDER**

The first antidote for beryllium poisoning, a disease that has affected several atomic energy workers, was reported by Argonne National Laboratory Friday as successful in animals.

Dr. Jack Schubert told the Chicago section of the American Chemical Society that the antidote combines with the beryllium to make it harmless.

\* \* \*

**THE CHEMICAL** is aurin tricarboxylic acid and has been given the name ATA for short.

**Toxic effects of beryllium, a lightweight metal, were first discovered in the fluorescent light industry several years ago.**

Now it has been used in the atomic energy program in the atomic reaction process and as a possible reactor construction material.

\* \* \*

**WHEN INHALED** in substantial amounts, beryllium seriously damages the lungs.

**There is no cure for the disease although some patients have been helped with ACTH, the anti-arthritis drug.**

Dr. Schubert and his associates, Marcia White, A. J. Finkel and

are hopeful that ATA or other similar compounds can be developed into a successful a treatment in humans as in animals.

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