

PUBLIC HEALTH

Downward Trend of Strontium-90 Reversed

► THE RECENT RUSSIAN nuclear tests will reverse the downward trend of the concentration of cancer-causing strontium-90 in the bones of children. The fallout from the Soviet tests may nearly double the contamination levels, Drs. J. Laurence Kulp and Arthur R. Schulert reported in *Science*, 136:619, 1962.

Dr. Kulp is a geochemist at Lamont Geological Observatory. Dr. Schulert, a Vanderbilt University biochemist, is attached to the U.S. Navy Medical Research Unit No. 3 in Cairo, Egypt.

Judging from past studies, the predictions made by Drs. Kulp and Schulert appear to be valid. They predict that the level of strontium-90 in milk will be about 25 micro microcuries per gram of calcium just from the Soviet tests alone. If no further tests had been made, the researchers predicted that within a few years the level in milk would drop to about 13 micro microcuries. Now it appears that there will be even a greater rise.

Their research also indicates that pregnant mothers who take mineral calcium can reduce substantially the strontium-90 concentration in the bones of their unborn children.

Although no significant increase in fallout levels has been recorded this spring from the Russian and the present U.S. tests, an Atomic Energy Commission scientist reported it is still too early to tell the full extent of contamination. (The U.S. Public Health Service has recently indicated on the contrary that the rise in fallout may be considerably less than anticipated.)

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SPACE

Soviet Iron Curtain Extends Into Space

► THE SOVIETS have put an iron curtain around space as far as information is concerned, Dr. Homer E. Newell, director of space sciences for the National Aeronautics and Space Administration, Washington, D. C., told *SCIENCE SERVICE*.

"We are in continuing contact with the Soviets," he said, "but we all have the feeling at NASA that their output of information is not as open as ours."

He noted that Russian scientific papers often quote results and findings on a "take it or leave it" basis, without enough information to verify or substantiate what they offer as scientific truths.

The Russians claim their limitation on information is dictated by military necessity. Dr. Newell pointed out, however, that it even extends to data on the structure and fittings of space capsules, which can have no more military implications than an automobile chassis without an engine.

The space sciences are the only area in which the Soviets maintain this secrecy, Dr. Newell said. In the biological sciences, oceanography, botany and medicine, papers presented by Soviet scientists are complete.

While NASA scientists are very much interested in Russian space probes, they have abandoned attempts to track Russian satellites.

"Of necessity, our tracking systems are directed to our own vastly expanded space probes and those of other nations with whom we have joined in space exploration," he stated. These nations include Italy, Great Britain, Canada, Australia, Japan and Sweden.

By 1965, NASA will be launching 120 sounding rockets annually and 20 or more unmanned satellites directed solely to expanding man's knowledge of the universe. Add to this number the several manned space flight projects now scheduled and it becomes easy to understand why tracking Soviet satellites must take a back seat.

Thus far, although the Soviets have achieved space spectaculars where man in space is concerned, they have not matched the United States in basic knowledge gained about the earth and the universe surrounding it. In weather, communications, astronomy and geophysics the United States is well ahead in the race for space and indications are that it will advance this lead.

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PUBLIC HEALTH

Dust Endangers Health Of Construction Workers

► SERIOUS occupational health hazards are seen in the excessive noise and silica dust to which modern highway and dam construction is exposing heavy construction workers.

Outdoor work in heavy industry is no longer healthy, Dr. Craig Burns of the Bureau of Occupational Health, California State Department of Public Health, Berkeley, told the American Industrial Hygiene Conference in Washington, D. C.

Recent studies by the California health agency have revealed that dry drilling operations on highway and dam construction are subjecting workers to excessive daily exposure to silica dust, and that nearly all phases of heavy machinery use engender noise levels above the maximum safety of 100 decibels. (Prolonged exposure to 100 and more decibels is considered potentially injurious to hearing.)

"Preliminary audiograms show some hearing loss in the majority of drillers and heavy equipment operators," Dr. Burns said.

There is much that can be done to reduce these health hazards, however, Dr. Burns explained, pointing out that track drills should be operated wet or be fitted with dust collectors.

"Tractor, truck and scraper exhaust outlets can be fitted with mufflers, as are automobile exhaust pipes," he said. "Application of sound absorbent materials in tunnel drilling needs to be tested. Air exhaust portals on drills can be muffled."

Inexpensive ear plugs and improvements on seats on heavy equipment were also mentioned as safety measures.

Fred Ottoboni, also of the Bureau of Occupational Health, was co-author of the paper.

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IN SCIEN

MEDICINE

Artificial Kidney Used For Severe Malaria Cases

► AN ARTIFICIAL KIDNEY has been used for what is believed to be the first time in treating cases of kidney failure due to severe malaria, including blackwater fever, it was reported in the *British Medical Journal*, May 19, 1962.

One of the malaria victims was a 36-year-old American civil airline pilot who had been flying regularly between the United States, West Africa and Great Britain. Unfortunately, he had neglected to take anti-malarial drugs, and damage was so extensive that he died in spite of treatment.

The other patients—three service men of the United Kingdom—were evacuated from Bahrein, Aden and West Africa by air. One died in transit, the other two recovered.

Dr. A. W. Woodruff of the University of London, and Air Commodore R. C. Jackson of Princess Mary's R.A.F. Hospital, Halton, Bucks, England, who reported the findings, warned that delay in taking preventive medication or in starting treatment can be extremely dangerous.

The rapidity and frequency of air transport from regions where malaria is common, particularly Africa, has called attention to the danger of patients developing malaria in temperate zones, the researchers pointed out.

It was formerly believed, according to the scientists, that patients with the severe form of malaria known as blackwater fever should not be moved, but in cases of kidney failure they should be flown to suitable places for treatment within three days after the kidneys fail.

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ASTROPHYSICS

Theory for Elements In Magnetic Stars

► A NEW THEORY to explain the puzzle of surprisingly high amounts of certain elements in stars having magnetic fields thousands of times stronger than the sun's was reported.

Dr. Eberhart Jensen, now at Sacramento Peak Observatory, Sunspot, N. Mex., suggests that localized regions of strongly magnetic stars may have field strengths ten times greater than the star as a whole. Within these localized regions, the very strong magnetic fields provide energy for particles to react to form high amounts of certain elements.

This mechanism could explain the high abundances of rare earth elements, Dr. Jensen reported in *Nature*, 194:668, 1962. Dr. Jensen is on leave from the Institute of Theoretical Astrophysics, University of Oslo, Norway.

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CE FIELDS

MEDICINE

Radioactive Phosphorus Produces Lung Cancers

► EXPERIMENTAL production of lung cancer in animals using P-32 (radioactive phosphorus) pellet implants was reported at the American Industrial Hygiene Association meeting in Washington, D. C.

A group of researchers at New York University Medical Center, Institute of Industrial Medicine, undertook preliminary experiments with the use of P-32 in the form of a soluble phosphate, exposing groups of animals to pellets containing 20 microcuries, 2 and 0.2 microcuries to determine the relation of cancer formation to dosage.

In order to evaluate critically the factors involved in radiation causes of cancer, the investigators developed a procedure for using isotopes of varying half-lives and beta energies.

A hollow plastic pellet was devised that could be filled and sealed by a specially designed remote controlled micro-pipetting apparatus. Such pellets allow utilization of materials without regard to their chemical properties.

Drs. Marvin Kushner and Norton Nelson, with Sidney Laskin and Samuel Posner, reported the study. They said "significant and dose-related" cancer occurrences were found in the dose range of the experiment.

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GENERAL SCIENCE

Ivory Coast Leader Both Physician and Politician

► PRESIDENT Felix Houphouet-Boigny of the Republic of the Ivory Coast, in the United States on an official visit, is a medical as well as a political leader of his people.

A former physician who worked for 15 years in the French public health service, the 57-year-old African statesman has placed great emphasis on advancing the health and living standards of the 3,500,000 inhabitants of the Ivory Coast, the richest and potentially most economically self-sufficient state in former French West Africa.

Since the turn of the century, the number of doctors in the Ivory Coast has risen from three to nearly 200. The greatest advance in medical personnel and facilities occurred after 1946 when Dr. Houphouet-Boigny was elected to the French Parliament as the Ivory Coast representative. He held this position until 1959, when the state achieved independence and he was elected as its first President.

Since 1946, 12 medical centers have been built and 16 others have been expanded and modernized to provide a total of 4,588 hospital beds. Forty-two pharmacists, 90

midwives and 800 trained male and female nurses are practicing in the country.

An \$8,000,000 expansion program is now underway to provide 19 more dispensaries, 10 maternity centers and 34 hospital pavilions.

The Ivory Coast President has also initiated a campaign to improve the dietary habits of the nation, encouraging greater consumption of meat and other proteins for better health.

A four-year program started in 1958 will ensure by the end of this year school attendance for 45% of the school-age population. President Houphouet-Boigny has said that his goal is to eliminate disease and illiteracy in the next generation.

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PHYSIOLOGY

Body Vibrations Found, May Be Key to Warmth

► TINY VIBRATIONS, discovered in the bodies of warm-blooded animals, may be the cause of regulated body temperature, according to a university scientist in Vienna.

The rhythmic, uninterrupted microvibrations were found to remain constant from birth to death (and for some time after) in all species of warm-blooded animals studied by Dr. H. Rohracher of the Institute of Psychology at the University of Vienna, Austria. They vary when the animal is active, under sedation, or sleeping, he reported.

Based on results of experiments, these minute vibrations must be caused by permanent, alternating muscle contractions, the scientist explained.

Because the vibrations are constant, yet absent in cold-blooded animals, Dr. Rohracher believes they are the mechanism by which warm-blooded organisms maintain precise body temperatures despite outside temperatures.

Man's body, throughout his life, is shaken constantly with 7 to 13 impulses each second, even during deep sleep. Even death does not immediately stop the vibration. Experiments with guinea pigs showed impulses continued 50 to 70 minutes after the heart had stopped.

Psychological shock and stress and physical exertion affect the amplitude considerably, and merely imagining movement (fist clenching or jumping) will raise the amplitude 70% above the relaxed state. Sedatives were found to lower the amplitude somewhat.

The extraordinarily minute movements created through this permanent muscle activity are transferred to the bones and organs, Dr. Rohracher said.

During hibernation there were long vibration-free periods found in animals intermediate between warm- and cold-blooded types. After awakening through warming, the microvibration was again started with normal amplitude and higher frequency.

All of the experiments performed by Dr. Rohracher lead to the conclusion that warm-blooded animals are warm-blooded because of the vibrations, he reported in *Naturwissenschaften*, 49:145, 1962.

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SEISMOLOGY

Computer Used to Find Fault Lengths

► A COMPUTER TECHNIQUE can accurately "measure" the length of movement along a fault or earth crack during or after a great earthquake.

Studying the ground surface waves involved in a large earth tremor, those which travel around the surface of the world, scientists can crank the information into an electronic computer and come up with direction and speed of the slippage of rock, as well as the distance it moves, two geophysicists from the Seismological Laboratory of the California Institute of Technology explained.

Earthquakes are caused by sudden slipping of rocks, usually along a fault or giant crack. The shearing action can move at 7,000 miles an hour and continue for many hundreds of miles along the fault, the investigators said.

Ari Ben-Menahem and M. Nafi Toksoz developed the technique from a study of seismic or shock records of several great tremors. They found, for example, that the Chilean 'quake in 1960 extended for 600 miles, mostly under the ocean, although evidence could not previously be found for the length of the crack.

Russian scientists could not determine the length of the Mongolian fault occurring in 1957 because it disappeared into ice and snow, but the Caltech scientists found it to be 340 miles long.

The next step is to find how deep the fault extends during the earthquake, the researchers explained. They also hope to be able to analyze the body waves, those which travel through the earth instead of around its surface.

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ZOOLOGY

Desert Animal Drinks From Blotter-like Skin

► A REPULSIVE little lizard has found the way to combat water shortage on the desert. With a blotter-like skin, the lizard collects the dew and drinks at its leisure.

Moloch horridus, a native of the desert regions of Australia, had been thought to soak up the water it needs through its skin, without taking the trouble to drink. Two Australian scientists, Drs. P. J. Bentley and W. F. C. Blumer of the University of Western Australia, have shown that the skin merely "funnels" dew and moisture to the mouth, a convenient way to gather more water than by lapping.

While drenching the lizard to see whether it did absorb water through the skin, the scientists noticed the mouth opening and closing for no apparent reason. With its mouth taped shut, it ceased gaining weight from the water.

The conclusion was reached that capillary movement across the skin to the mouth has solved its water shortage problem. Results were reported in *Nature*, 194:699, 1962.

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