

ENGINEERING

Strontium-90 for Power

THE USE of strontium-90 as a long-lasting source of electricity for remote stations all over the world has been predicted.

Radioisotopes are a promising source of electrical power, Dr. Jerome G. Morse of The Martin Company's nuclear division, Baltimore, Md., told scientists at the Third Industrial Nuclear Technology Conference meeting in Chicago. Fuel for remote, unmanned operations is one suggested use.

Radioisotope-fueled power plants can be designed to deliver a predetermined power output for long periods of time.

Describing the Martin Company's strontium-90 power program, Dr. Morse said that this radioisotope can be converted to a useful form of power generation by using it in heat generators. With a half-life of 28 years, strontium-90 would be a power source that would not "materially decrease over a five- to eight-year period."

An experimental design and development program has been started to yield a completely safe yet reliable and maintenance-free power source, Dr. Morse said. Both land and sea versions of a power generator capable of producing 100 watts of electrical energy were designed.

The land-based unit is expected to operate at an efficiency of five percent minimum, while the marine generator will have an estimated eight percent efficiency. This is due to superior heat dissipation by water, the scientist explained.

A central core of strontium-90, compounded into a material having the lowest possible solubility in hot or cold sea or fresh water, would be encased in a "suitable

metal container." This container, Dr. Morse said, would be designed to provide the best possible protection against corrosion, thermal and physical shock and melting. An electrical conversion system, using thermoelectric materials, would have to be designed to match the long life of the strontium-90.

The strontium-90 heat element would have to be in such a form that "ingestion or absorption by organic life is impossible under any conceivable conditions," Dr. Morse warned. Biologic shielding would protect human life from the radiation field.

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MEDICINE

Osteoarthritis Is Rare In Alaskan Eskimo Men

ONE TYPE of arthritis is not as prevalent among Alaskan Eskimo men as it is among other American males.

Despite the cold and snow of the north, osteoarthritis, which causes stiffness and pain in the joints but does not cripple, occurs less in Eskimo males than in other American males of the same age.

This was reported by Drs. Baruch Blumberg, Kurt Bloch and Joseph Bunim of the National Institute of Arthritis and Metabolic Diseases. They presented the results of their studies at the Pan American Congress of Rheumatic Diseases meeting in Bethesda, Md.

A study of three Eskimo villages revealed that osteoarthritis was less common among

male villagers. The women, however, were found to be as prone to this type of arthritis as any other American woman.

In addition, the inhabitants of Wainwright, an Eskimo village on the Arctic Ocean coast, were studied. Blood samples and X-rays of the Eskimos' joints were taken to help diagnose cases of definite or probable rheumatoid arthritis. This type of arthritis is extremely painful and causes severe crippling.

Among 211 villagers, two cases of rheumatoid arthritis were found. Both cases were discovered in women who were over 50 years of age.

It is difficult to compute an accurate prevalence figure for rheumatoid arthritis in elderly Eskimos, since very few live past middle age, Dr. Blumberg pointed out. Furthermore, little is known about the prevalence of this type of arthritis throughout the population of the world, as very few studies have been made to date.

However, rheumatoid arthritis appears to be as common among Eskimos as among other Americans. Eskimo men tend to do more manual labor. Hence, they use their hands for heavy work more than the average American, the doctors said.

This study was undertaken to determine if geographical area might affect the rate of occurrence of arthritis.

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BACTERIOLOGY

Arthritis Caused by "Staph" Found Rising

ARTHRITIS caused by the germ staphylococcus may be on the rise because of the appearance of staphylococcus strains resistant to penicillin.

This kind of arthritis was thought to have been licked by the widespread use of penicillin after World War II.

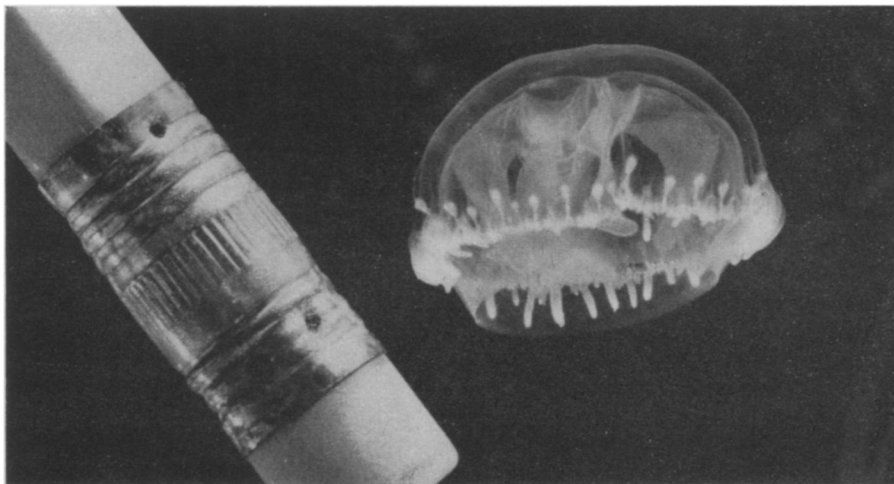
However, Drs. L. Myrton Gaines Jr. and Lawrence E. Shulman of Johns Hopkins University suggested this may no longer be the case. They reported results of a survey of germ-caused arthritis in Johns Hopkins Hospital between 1940 and 1958 at the Second Pan-American Congress on Rheumatic Diseases, held in conjunction with the American Rheumatism Association meeting in Washington.

Health officials have expressed concern about the growing problem of staphylococcal infections resistant to drugs, especially in hospitals. Rigorous precautions have been taken in many hospitals to guard against the spread of these organisms.

Drs. Gaines and Shulman reported that, in 53 cases of germ-induced arthritis found in the Johns Hopkins Hospital in the 18-year period, some were caused by streptococci and pneumococci but "the staphylococcus (hemolytic *Staphylococcus aureus*) was the most common offender." This organism is prevalent in hospitals and very resistant to antibiotics.

Staphylococcal arthritis affects all age groups and has an unusual propensity to involve the hip or knee, they said.

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JELLYFISH—Photographed by high-speed flash in an Indiana University zoology laboratory, a jellyfish swims past the end of a pencil. It is a member of the genus *Craspedacusta*, the only freshwater jellyfish in North America. They are found in a few lakes and ponds in Indiana and some other states. It travels by jet propulsion, as water is forced out behind by contraction of the bell-shaped body. Since they are one of the simplest of multicellular animals, the tiny jellyfish are proving a useful medium for research on zoological problems. They are thought to have come originally from China, and probably have been distributed as polyps (a microscopic, bud-like stage of their life cycle) in shipments of aquatic plants and tropical fish.