

Zirconium of Oregon Black Sands Provides Metal for A-Sub Engine

The "Sleeping Beauty" of the world's metals, awakened by scientists from the black sands of Oregon's ocean beaches, provides the material from which the nuclear, or thermal reactor (engine) of the navy's new atomic-powered submarine is being built.

Westinghouse Electric corporation this past week announced the sensational new use of the metal, zirconium, little-used and little-known since its discovery in 1789, and the U. S. bureau of mines laboratory at Albany, Or., revealed it had developed zirconium from the black sands of Coos and Curry counties.

When Westinghouse scientists tackled the assignment of building the first submarine nuclear reactor they decided zirconium would be better than iron, steel, aluminum or other metals. Zirconium resists corrosion, has a high melting point, is strong and workable, and will not waste (absorb) neutrons, the atomic bullets that split uranium atoms and keep the atomic engine "running."

Oregon Sands Tested

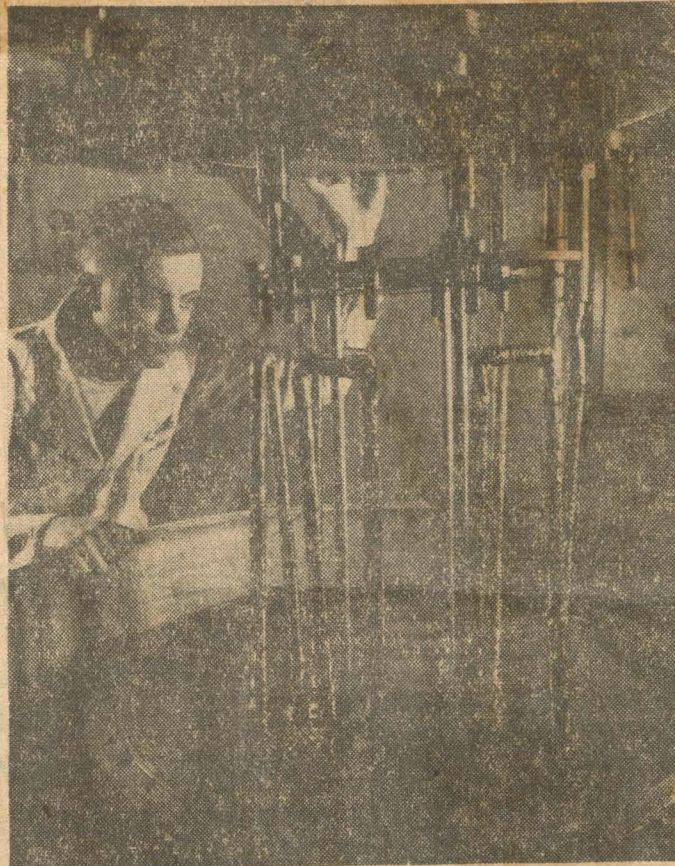
Zirconium was known to be present in the sands that wash ashore on the beaches of southern Oregon, Florida, Australia and other countries. The problem was how to eliminate impurities and achieve mass production. Pieces of zirconium the thickness of a lead pencil and costing \$250 a pound would not fit the specifications.

In 1948, Navy Captain H. G. Rickover threw navy support behind the development work being carried on by the bureau of mines laboratory at Albany. The laboratory, said Director Stephen M. Shelton, was working with the Oregon sands, on a small scale, following a process developed by a Dr. Kroll, of Luxembourg, who had come to the United States in the late 1930s.

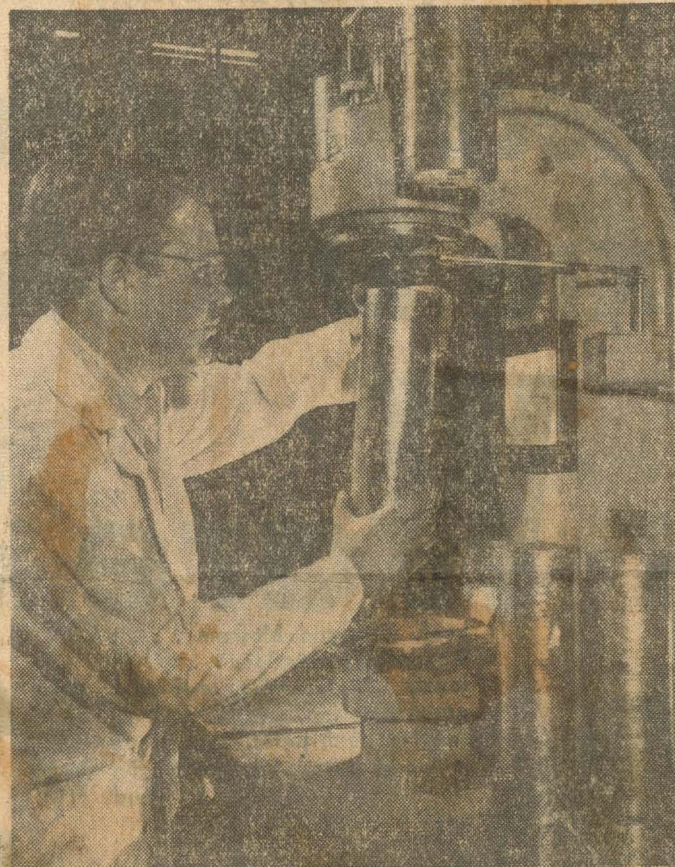
Westinghouse, said Dr. W. E. Shoupp, director of development for the corporation's atomic power division, set up a zirconium refining plant, staffed it, with scientists often working 15 hours a day and seven days a week, and got it into full production in 14 weeks.

Florida Item Speeds Output

The Albany laboratory, operating on the campus and using the old buildings of historic Albany college, expanded its facilities on a "very large scale," including construction of a new plant. From the beach sands it produced, in a six-step process, a zirconium "sponge"—porous chunks of metal that look like coke which, although relatively pure, still had to go through a refining process for use in the atomic reactor.



"Hairpin" wires of zirconium, which were thin wire filaments when immersed in tanks containing zirconium tetra-iodide, become bright crystal bars, 99.9 pure metal, when removed.



Sand from Oregon beaches was the basis of the process which resulted in producing this ingot, 99.9 per cent pure zirconium. Ingot is tested for hardness in Westinghouse laboratory.

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