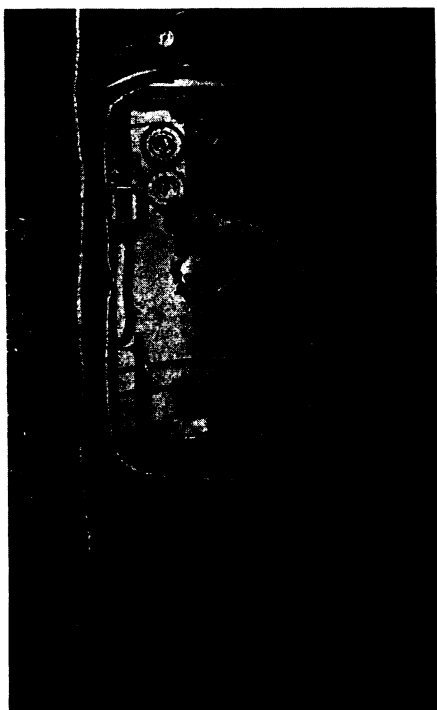


"As a result of our studies," the speakers added, "we have attempted to outline the requirements for a more naturally comfortable and steadier ship than that of usual design. The principal requirements are that the ship must have a long period of roll and a low center of gravity. The problem of steering must also be considered with the purpose of reducing yawing to an absolute minimum.

"While we do not presume to say that a ship can actually be designed in accordance with these requirements, we do feel that improvement in sea qualities can be obtained if attention is paid to these requirements."

"In the usual design of present-day ships the center of gravity is considerably above the center of the vertical water plane. Consequently, each yaw causes a centrifugal force which manifests itself in heeling of the ship, or causing what we have termed 'yaw-heel.' Unfortunately, the direction of this yaw-heel invariably augments the normal rolling and will even cause rolling when theoretically none should exist. We believe this is why some ships for no apparent reason have turned out to be notorious rollers."

*Science News Letter, November 23, 1935*



#### TO PREVENT BENDS

*This decompression tank makes it possible for the deep sea diver to rise to the surface in much less time than usual without developing the dreaded bends. The diver, entering the tank, has removed air and telephone lines shown outside the tank on the left.*

METALLURGY—MEDICINE

# Tungsten Alloy Aids Cancer Treatment by Radium Rays

## Combined With 5 to 10 Per Cent. Copper or Nickel, Shield Can Be Made Much Smaller Than Lead Bomb

A NEW tungsten alloy which effectively takes the place of more bulky lead as a "screen" when massive doses of radium rays are being administered has been developed for use at the Westminster Hospital, London.

The bomb-shaped containers in which large packs of radium are shielded in hospitals can be made much smaller with the new alloy and yet have the same screening effect. A volume reduction to nearly half the former size is attained.

More compactness means that the patient can be placed closer to the source of the radium rays, if need be, and receive more intense radiation.

The new tungsten alloy resulted from the researches of Sir John McLennan while he was scientific advisor of the Radium Beam Therapy Research Company and of Dr. C. J. Smithells of the (British) General Electric Company. Sir John recently died while on a vacation on the continent.

When massive doses of gamma rays from radium are administered to cancer patients, a large amount of radium is necessary. Many authorities believe not less than four grams of radium, valued at close to \$200,000 is the minimum. This potent radium pack is shielded so that its piercing gamma rays do not strike doctors and nurses or any parts of the patient's body except the afflicted area.

The complete equipment, radium and its shield, is known as a radium bomb.

Although lead is easily shaped and machined, and is relatively cheap, it takes a somewhat unwieldy size of lead bomb to provide adequate screening for four or more grams of radium.

The screening effect of lead is due to its high density (11.35), the degree of absorption of gamma rays by metals being nearly proportional to the density of the metal.

Plainly, a smaller quantity of a denser metal than lead would have an equivalent screening effect, but the only suitable metals in this category are gold, platinum and tungsten. Of these the first two are prohibitively expensive.

There remained tungsten, best known

in the form of electric lamp filaments.

Tungsten's high theoretical density (19.3) is only found when the metal has been treated by expensive metallurgical processes.

The difficulty of cost was overcome by the tungsten alloy. By adding from 5 to 10 per cent. of either copper or nickel, an alloy of a density in the neighborhood of 17 could be successfully evolved on the desired scale, and for about \$5.00 per pound.

The tungsten alloy radium bomb is only 64 per cent. as large as the lead bombs previously used. The size is in the ratio of the densities of the two materials, 11 to 17.

The new tungsten alloy has been adopted for use by the Westminster Hospital for its 4-gram radium bomb now being constructed under the direction of Dr. H. T. Flint and C. W. Wilson. It is also to be used for the radium bomb at Birmingham, England.

*Science News Letter, November 23, 1935*

RADIO

## Sending Facsimiles by Radio Possible Soon

HIGH-SPEED radio transmission of complete facsimiles of any written, typed or printed material will be inaugurated on an experimental, non-commercial service between New York and Philadelphia before the end of the year, General James G. Harbord, chairman of the board of the Radio Corporation of America, indicated in an address at Princeton University.

The facsimile service and television are linked hand-in-hand, declared General Harbord, for research in one aids the other because of the similar problems.

Television is nearer today, he added, than was the possibility of sending a telegram across the ocean with wires on the eve of Marconi's first transatlantic wireless test.

*Science News Letter, November 23, 1935*

Leprosy attacks far more men than women.