TECHNOLOGY

Find Nose Cone Metal

➤ BERYLLIUM, one of the newer metals, may prove to be the answer in beating the heat problem of getting a ballistic missile back to earth without having it burn up as it re-enters the earth's atmosphere.

The metal, which is still a novelty in metallic form, has been found to be very "attractive" for making ballistic nose cones in studies by Jackson R. Stalder of the National Advisory Committee for Aeronautics' Ames Aeronautical Laboratory, Moffett Field, Calif.

In comparison with three other materials, Inconel-X, copper and graphite, beryllium came off best as a weight-saver and heat-absorber.

Despite the fact that the "perfect" material for a nose cone has yet to be found, we do have a blunt nose cone using the principle of shock wave transference to protect the in-coming missile from burning up. Just such a nose cone that successfully beat the re-entry problem was shown to the American people by President Eisenhower. Beryllium was not used for this nose cone.

Finding a perfect heat-absorber to act as a heat-sink for a ballistic nose cone requires that the material must maintain the structural integrity of the missile, must be as light as possible, and must lend itself to fabrication into the required shapes.

When a ballistic missile enters the earth's atmosphere at high speed, Mr. Stalder says, its total kinetic and potential energy is ultimately dissipated in the form of heat. A portion of this energy is delivered to the atmosphere and the remainder must be absorbed by the missile itself.

The portion absorbed by the missile can either be stored in a heat sink or absorbed and rejected by an internal cooling system.

In trying representative materials of several different groups under conditions simulating a ballistic trajectory, Mr. Stalder found beryllium the most promising for a heat-sink, with graphite the closest runner-up.

Beryllium, the tests showed, is very lightweight with a high specific heat and thermal conductivity. When compared with copper for making a heat-sink, for example, beryllium would result in a weight saving of sixfold. Its oxidation resistance is good and this would eliminate the need for surface protection.

There are drawbacks, however, Mr. Stalder has found. The metal is brittle and in the present state of its metallurgical development, difficult to form in large sections.

Science News Letter, December 14, 1957

PUBLIC HEALTH

Addiction Exaggerated

➤ DRUG ADDICTION among younger persons, although a problem, is not as alarming as most people think it is, the American Medical Association's council on mental health reports.

Frightening images of American youth being preyed upon by unscrupulous dope peddlers are not very true to life.

Addiction apparently spreads from person to person, with addicts giving drugs to the beginner as a friendly gesture. Active "conversions" by drug peddlers play only a very small role in spreading addiction, recent studies have shown.

There are probably not more than 60,000 addicts in the U. S. and only about 13% of them are under 21 years of age. The number of young addicts has increased since World War II, but the problem was not new at that time. A similar alleged increase of young addicts took place after World War I.

Opiate addiction is undesirable but it is not nearly as evil as the public and law enforcement officers think it is, the council reports.

Opiate addiction does not cause the degree of damage to physical health other intoxications tolerated by our society can cause. Nor does it incite its victims to commit violent crimes which they would not commit without the drugs. Opiates are quieting drugs that repress hostile urges and depress sexual drives.

The common idea that addicts continue to take drugs because they fear the withdrawal symptoms may not be too accurate. Addicts recover relatively quickly from the withdrawal illness, the worst of it being over after three to seven days.

It is not unusual for addicts to "kick the habit on the street" without medical help. Many seem to have no overwhelming fear of the withdrawal illness any more than the alcoholic has any great fear of the "hangover."

The report also says that "in view of all available evidence," it would not be wise to set up clinics for supplying drugs to addicts. But this opinion should be reviewed from time to time as new scientific knowledge concerning addiction becomes available.

The council's report is being published in three consecutive articles, the first of which appears in the *Journal of the American Medical Association* (Nov. 30).

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BACTERIOLOGY

Nitric Oxide Gas Helps X-rays Kill Bacteria

➤ BACTERIA surrounded by nitric oxide gas become at least twice as sensitive to the killing effects of X-rays as those kept in a normal atmospheric environment, Dr. P. Howard-Flanders, University of California, Berkeley, reports in *Nature* (Nov. 30).

Nitric oxide is not the only gas that can do this. Oxygen has been known for some time to increase the effectiveness of X-rays, but nitric oxide appears to be the first recognized substance that can do the job under a complete lack of oxygen.

All bacteria do not need oxygen to live, and those that do not are called anerobic bacteria.

One type of such bacteria produces gas gangrene in humans and becomes dangerous only when the oxygen around it is greatly reduced.

The amount of increased sensitivity to X-rays created by the nitric oxide is about the same as that with oxygen, Dr. Howard-Flanders reports.

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