

## ENGINEERING

**Damping Capacity of Metals Is Design Factor**

THE RINGING sound you expect to hear when you tap quality glassware or flip an authentic coin on the counter is due to a material property known as damping capacity.

Lack of this damping capacity or ability to deaden vibration, can lead to irritating resonance in the sounding board of a piano or the amplifier of a radio, phonograph or television.

This "shock absorber" nature of materials is beginning to be recognized as an important factor in the design of hundreds of different objects from hi-fi sets to guided missiles, the U. S. Bureau of Mines has reported.

Damping capacity enables some metals to withstand the weakening effects of vibration, but this knowledge has not been applied widely in architectural and engineering design. There, its significance is only now becoming apparent, the Bureau said.

Low damping capacity in metals has been blamed for bridge failures and airplane crashes. Vibration fatigue can also be a trouble source in missiles traveling at super-sonic speeds.

Bureau investigations in this field are concentrated at the Mississippi Valley Research Center, Rolla, Mo., where considerable progress has been made in finding ways to measure the damping capacities of many metals.

This progress is described in a Bureau publication, Report of Investigations 5441, "Damping Capacity—Its Measurement and Significance," obtainable from the Bureau of Mines, Publications—Distribution Section, 4800 Forbes Ave., Pittsburgh 13, Pa.

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## BACTERIOLOGY

**Leprosy-Causing Bacteria Live Long in Culture**

A STRAIN of leprosy-causing bacteria has been successfully grown in tissue culture for periods as long as seven weeks.

Researchers have spent many years attempting to maintain the growth of the leprosy bacillus outside the body. Now, Dr. Y. T. Chang of the National Institute of Arthritis and Metabolic Diseases, Bethesda, Md., has a culture growth that lasts long enough for scientists to make drug tests.

The bacteria cause leprosy in rats, he reported at the Federation of American Societies for Experimental Biology meeting in Atlantic City, N. J.

This culture will allow a more detailed study of the bacteria and provide a means for the rapid testing of possible antileprosy drugs.

The leprosy bacillus has proven to be one of the most difficult of all types of bacteria to grow outside its natural host, and although it grows vigorously inside body cells, it will stop multiplying and soon die if placed in an artificial environment.

Dr. Chang's bacteria are the Hawaiian strain of an organism known as *Mycobacterium leprae murium*, which causes leprosy in rats.

These bacteria do not cause leprosy in man but they do belong to the same bacteria family as human leprosy bacilli. The two types are so similar they cannot be differentiated under the microscope.

The cells for the culture growth are obtained from the body cavities of mice. They are known as macrophages, large mononuclear cells whose function in the body is to surround, ingest and destroy foreign matter.

Past attempts by other investigators to get the bacteria to grow in cell cultures have resulted in only limited bacterial multiplication. In one of Dr. Chang's cultures, the number of bacilli increased seven times in seven weeks.

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## MEDICINE

**Lung-Cancer, Smoking Statistics Challenged**

THE STATISTICAL studies that link smoking with eventual lung cancer have been challenged.

The question of the cause of cancer is biological, not statistical, a doctor charges.

Two of the most famous of these studies, that of Doll and Hill in England and Hammond and Horn in the United States, are the subject of his discussion of the validity of the conclusion that smoking causes lung cancer.

Dr. Joseph Berkson, section of biometry and medical statistics, Mayo Clinic, Rochester, Minn., explained that the studies revealed more than the alleged smoking-cancer link.

For instance, the Hammond-Horn studies supervised by the American Cancer Society, show that persons who smoked died of other diseases too. In fact, only 13.5% of the deaths were due to lung cancer, their second study showed. The remainder died of causes other than lung cancer.

Another 13.5% of the deaths were due to other types of cancer. The largest proportion of deaths was attributed to coronary heart disease, Dr. Berkson points out.

The death rate from cancer of the lung among smokers was larger than among non-smokers in the sample population, but lower than the death rate from cancer of the lung among the general population. The general and specific death rates in both groups' studies were low compared with corresponding death rates for the general population.

The theory that smoking causes lung cancer is derived from statistical studies, the researcher says. But the question of the cause of cancer is basically a biologic, not a statistical problem. The reports contained no substantial clinical, pathologic or other independent direct evidence that smoking was the cause of lung cancer, he emphasizes. Dr. Berkson's paper is reprinted in the *Proceedings of the Staff Meetings of the Mayo Clinic* (May 15).

Science News Letter, May 23, 1959

**IN SCIENCE**

## PHYSICS

**Lithium Found High In Northern Atmosphere**

LITHIUM, used for making hydrogen bombs, has now been found high in the atmosphere over the Northern Hemisphere for the first known time.

Source of the lithium has not yet been determined but many scientists have blamed its presence in the Southern Hemisphere on the hydrogen bomb tests conducted in the South Pacific by the United States. Other speculative sources named have been meteors and the evaporation of sea water.

Dr. A. Vallance Jones of the University of Saskatchewan in Canada says that he found evidence of lithium in the upper atmosphere near Saskatoon during the period Jan. 10 to 29. The hydrogen bomb element could have come from nuclear explosions, he reports in *Nature* (May 9).

However, Dr. Jones points out, a sea water or meteoric origin must also be considered possible until further measurements have been made.

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## PUBLIC HEALTH

**Strontium-90 Absorption Predicted for Children**

MORE EVIDENCE has been collected in the attempt to predict the future distribution of strontium-90 for the entire world population.

Samples of human bone received from about 35 stations throughout the world have been analyzed and the amount of strontium-90 calculated for adults and children. On the basis of these tests Drs. J. Laurence Kulp, Arthur R. Schulert and Elizabeth J. Hodges of Columbia University's Lamont Geological Observatory have predicted how much of this fallout product will appear in a young child's bones less than 10 years from now.

In 1966, they say, the average young child in the world will have about four micro-microcuries of strontium-90 per gram of calcium. Some 10% may get as much as eight micromicrocuries; one percent may reach as high as 20.

In January, 1958, the average amount of strontium-90 in adults' skeletons was 0.19 micromicrocuries, about one-twentieth the amount predicted for young children in 1966. At that date the amount for all persons, including children, in the world was about 0.52 micromicrocuries per gram of calcium.

It is still not certain what hazards these levels present to the human race, the scientists conclude in *Science* (May 8).

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# E FIELDS

## EDUCATION

### Engineer Enrollment Drops First Time in Years

IN THE face of the nation's greatest need for trained engineers and scientists, freshman engineering enrollment declined markedly in 1958 for the first time in eight years.

Furthermore, one in five engineering schools expects a further drop in freshman enrollment next fall.

Last year, 70,029 engineering freshmen enrolled in the nation's schools compared with 78,757 in 1957. This was a drop of 11.1%. Total college freshmen enrollment in 1958, however, was up seven percent over the previous year.

These facts were contained in a report made public by the Engineers Joint Council, covering 223 institutions in the United States granting degrees in engineering.

Heads of engineering schools said applications from qualified students have fallen for these three reasons:

1. A false appraisal of the long-range engineering career opportunities by counselors, students and parents, based on reports in the general press on lay-offs during the 1957-58 recession.
2. Increased concern about the rigors of engineering curriculum.
3. Increased interest by potential engineering students in other scientific fields.

Engineers Joint Council is a national federation of 20 major engineering societies representing 300,000 of the country's engineers.

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## BACTERIOLOGY

### New Deadly Diseases Made From Tiny Molds

THE TINY mold that causes "athlete's foot" has been turned into a new deadly disease.

Deliberately designing new diseases from molds may now be possible, a microbiologist reported to scientists at the Society of American Bacteriologists meeting in St. Louis, Mo.

Usually molds that cause athlete's foot will grow only on the skin. If one of these molds is injected into an animal's body, it will not cause disease even though huge amounts are given. Now, however, there is evidence the relatively harmless molds can be changed into deadly forms, Dr. George H. Scherr of the University of Illinois College of Medicine said.

Three different molds were placed in small cellophane bags which were then surgically implanted into the body cavities of rabbits. The molds could not escape, but nutrients could enter, keeping the molds alive. In each case, the mold gradually

began to change its shape, Dr. Scherr said, and in approximately 20 days "had assumed a form and character completely different from the one placed in the cellophane bag."

When each new mold was injected into rabbits and mice, a severe infection resulted which destroyed the animals' internal organs. If the disease was transferred from animal to animal, it became progressively worse. No way is now known to combat the new disease, Dr. Scherr explained.

The disease caused by the changed molds may be regarded as different from any disease known, he said.

The study may contribute to knowledge of how some bacteria suddenly can infect man and animals.

John W. Rippon, one of Dr. Scherr's students, worked with him in the study.

Science News Letter, May 23, 1959

## GENERAL SCIENCE

### Oppenheimer Urges End Of Arms as Arbiters

THE ABILITY of the inherited institutions of our civilization to make proper decisions on uses of the unprecedented new instruments of warfare, like atomic energy, was called in question by Dr. Robert Oppenheimer, atomic energy pioneer and director of the Institute for Advanced Study, Princeton, N. J., in opening a symposium in New York on basic research.

Arms must not continue to be the last arbiter of disputes, he said.

"If we do not treasure the great inheritance on which all our work and life are based, and understand the radical novelty and the gravity of the situation in which we find ourselves," he warned, "there will be few of our children to ask again of the need for new knowledge."

Dr. Oppenheimer and other speakers urged the need of continued basic research, or inquiry directed not primarily to a practical result but to the obtaining of new knowledge.

No laboratory should be so directed to its practical missions that it cannot afford perhaps a sixth or a fifth of work that is on the face of it unrelated to its purposes, Dr. Oppenheimer said.

The great lesson of the past atomic decades has been, he observed from his direction of atomic bomb research, that men of science who have spent their whole lives in the quest of new knowledge may be among the most gifted practitioners of technology.

Dr. Alan T. Waterman, director of the National Science Foundation, Washington, declared that for continued growth in scientific research and technology and for realization of the full potential in basic research, there must be widespread public recognition and appreciation of the importance of intellectual and scholarly activity.

Dr. W. O. Baker, vice president, Bell Telephone Laboratories, advocated transference to practice in mathematical reasoning a fraction of the time given to learning of physical skills which are of diminishing importance.

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## ROCKETS AND MISSILES

### Returned Space Capsule Given to Smithsonian

THE FIRST instrumented capsule recovered intact from outer space after returning to the earth's surface at free-falling speed was presented to the Smithsonian Institution on May 15.

Officials of the U. S. Air Force said the "Data-Sphere," which is 18 inches in diameter, was launched on June 13, 1958, from Cape Canaveral, Fla. It rose more than 200 miles, re-entered the earth's atmosphere at a speed of more than 10,000 miles an hour and was ejected from the nose cone of its rocket without parachute or other retarding device.

After falling freely, the capsule struck the South Atlantic with an impact 40,000 times greater than the force of gravity. The sphere presented to the Smithsonian is the first of a series of such capsules recovered from Thor and Atlas missile firings. Each is equipped with a tiny tape recorder, a battery power-pack, dye marker, and a "bomb" that sends out a sound to indicate its location for recovery purposes.

Data recorded include temperatures, pressures, stresses during take-off and climb, conditions at the greatest altitude attained, heat encountered during re-entry into the atmosphere, and the tremendous forces of final impact as the capsule slammed into the water.

As presented to the Smithsonian, the sphere has all its original instruments installed, still surrounded by the foamlime mass that kept them from shifting inside the plastic capsule. The sphere's upper half is yellow to make it more visible, and the bottom half is coated with a greenish-black fish-repellent chemical.

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## ASTRONOMY

### Rediscovered Comet May Give Fall Meteor Display

A COMET expected to give a good display of meteors this fall has been rediscovered by Elizabeth Roemer of the U. S. Naval Observatory in Flagstaff, Ariz.

Although it is now much too faint to be seen without a very large telescope, the comet will brighten sufficiently by late October to be visible with binoculars or a small telescope. Known as Comet Giacobini-Zinner, the object is remarkable for the showers of meteors it produced in 1933 and 1946.

The comet will be within about 30,000,000 miles of the earth on Nov. 7, and the meteor display is expected about the same time.

News of the comet's rediscovery when it is only a faint magnitude 20 was reported to astronomers in the Western Hemisphere by Harvard College Observatory, Cambridge, Mass.

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