

## ASTRONOMY

# New Use for Shock Tubes

► SHOCK TUBES, which are being used so successfully to design guided missiles for jet planes, are giving astronomers real clues about what is going on in the atmospheres of stars.

Reports by University of Michigan physicists on this unexpected application of a laboratory instrument widely used by aeronautical engineers were a highlight of the conference on stellar atmosphere now being held at Indiana University.

Using a shock tube, the scientists are duplicating in the laboratory under known conditions temperatures found in our sun and other stars. The astronomers, specialists in stellar atmospheres, known as astrophysicists, are excited by prospects of what they can learn for the first time with this instrument.

In the shock tube a shock wave is set up when a gas at very high pressure bursts into a chamber containing a gas at very low pressure. For a bare fraction of a second, two microseconds, the gas behind the shock wave reaches such high temperatures, about 15,000 degrees Kelvin, that it makes its own light.

Aeronautical engineers are using such shock waves blasted against model missiles and jet planes to check on their stream lining.

The Michigan physicists are looking at the self-luminescent gas with a spectrograph, an instrument that splits light into its many components. They use the spectrum so obtained to get the identity and intensity of the chemical elements present.

In this way they can get clearer pictures of what happens in the high temperature gas than they can by examining light from far away stars which are made of gas of very high temperature.

Only hydrogen and helium at the high pressure end of the high shock tube and xenon and argon at the low pressure end have been used so far.

The scientists hope in the future to get spectrograms of other elements by introducing them into the shock tube. They also hope to determine the ratio of the intensity of the several spectral lines of these various elements.

The research was done by Drs. E. B. Turner and Alan C. Kolb.

Science News Letter, October 16, 1954

## ICHTHYOLOGY

## Compressed Air Used to Save Fish

► COMPRESSED AIR and a pipe with holes punched along its length may save thousands of fish annually from dying in ice-bound lakes.

An Arizona biologist has perfected this method of winter-kill prevention which opens a channel in frozen bodies of water by pumping compressed air through a perforated pipe anchored to the bottom.

The channel allows light to reach green plants, which produce oxygen needed by the fish. Normally, the ice prevents enough light from reaching the oxygen-producing

plants and thousands of fish succumb to asphyxiation.

Jack Hemphill of the Arizona Game and Fish Commission tried his new method at Big Lake in east central Arizona last winter.

He laid a plastic pipe, 2,400 feet long and perforated every 15 feet, across Big Lake at a depth of five feet. It was anchored with 10-pound stones.

In eight days of operation, the compressed air escaping through the pipe forced the warmer water at the bottom to the surface and opened a channel 1,700 feet long and 450 feet wide.

Previously, State Fishery Commissions, with damaging winter-kills, had tried shovelling off the snow, melting the ice with lampblack and chopping holes in the ice, with little success.

The new method is now being considered by other State Commissions as well as large shipping firms which operate through northern canals in the Great Lakes.

Science News Letter, October 16, 1954

## PSYCHOLOGY

## Take Week Off Before Deciding to Change Job

► IF YOU are about to change your job, take a week off before making a final decision. During that week, get plenty of sleep and rest.

This is the advice of Dr. Alan Gregg, vice president of the Rockefeller Foundation, New York. He gave it to medical scientists at the U. S. National Institutes of Health, but much of what he told these medical researchers might apply to scientists in other fields and to people in general.

"Too many of the final decisions about changing one's job are made when one is too busy with other things," Dr. Gregg pointed out.

"Nice decisions of major importance take an amount of nervous strength that you simply do not possess if you come tired to the task of deciding."

If the new job involves a change of residence, Dr. Gregg advises that you visit the new location and take your wife with you. Her life, he points out, is involved as much as yours, although differently.

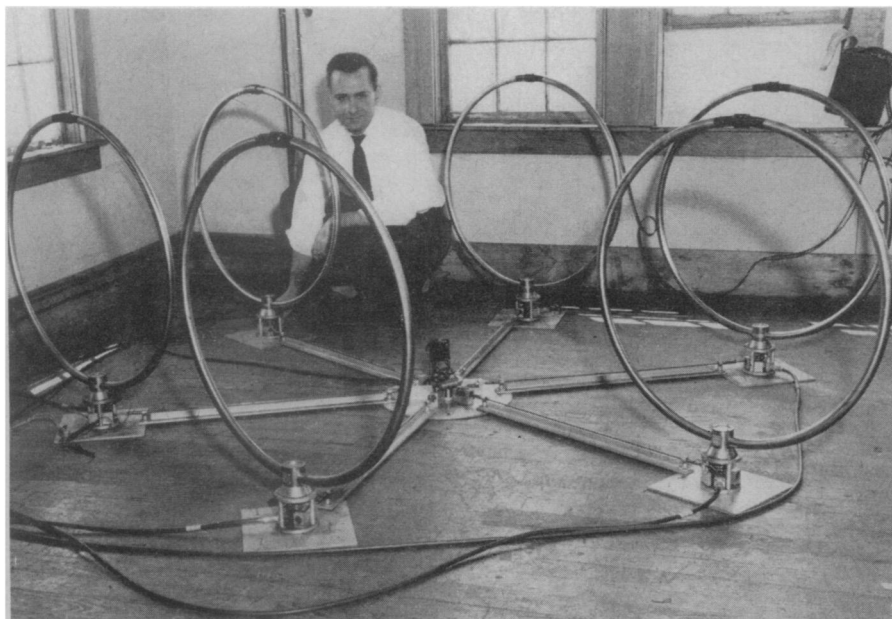
"Read the fine print in the offer and between the lines for what is not written," Dr. Gregg advises.

"Distinguish between decisions that are irrevocable and those that can be postponed or reversed. Not all calls are last calls, nor all destinations final. And in any job that looks like a balloon ascension, look to the question of having a parachute—an alternative if all does not go well."

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Suitable powder for surgeons to use on their hands under operating gloves was developed from starch; it is absorbable by the human body in case a glove breaks.

Twenty-six states now recommend or approve the inclusion of pesticides in fertilizers.



**ROLLING HOOPS**—Although it looks like a game, this assembly of hoops at the Air Force Cambridge Research Center serves as antenna loops to pick up the noise generated by atmospheric electricity. The loops rotate and pick up the loudest signals when pointed directly at the noise source.