

PHYSICS

Pinch Instead of Can

Look for way to control fusion of hydrogen bomb without need for container able to withstand extremely high temperatures.

► CONTROLLING the H-bomb's fusion reactions for peaceful purposes without the need of a container able to withstand the tremendously high temperatures required is the aim of studies described to the American Physical Society meeting in Los Angeles.

Since supplies of light elements that can be fused or joined together are almost limitless, compared with supplies of uranium and other fissionable materials, scientists in many laboratories in the United States, England, Europe and India are attacking the problem of taming fusion reactions.

To make light elements fuse, temperatures of many thousands of degrees are required. Such temperatures are found in the sun and other stars, and when uranium or plutonium are fissioned or split in an atomic bomb.

But generating the required heat in a controlled manner means having containers that will not melt or be affected otherwise.

A new approach, eliminating the container problem, is to use the so-called "pinch effect." J. A. R. Samson and Dr. R. E. Vollrath of the University of Southern California reported to physicists their experiments on using this effect to obtain high temperatures for fusion in a gas column that touches no walls.

Atomic Energy Commission scientists are believed to be working along similar lines, but their work is shrouded in secrecy.

The pinch effect is the name given to the contraction of an electric current due to its own magnetic field. This shrinking occurs in any liquid or gas carrying a current, such as the familiar neon tube, but is usually much too small to be noticed or measured.

When large enough currents are used, however, the current will pull itself into a thin thread, and can even cut itself off.

As the gas contracts, it shrinks from the walls, until the thinning column is its own container, completely out of contact with the sides.

Dr. Vollrath and Mr. Samson are experimenting with hydrogen gas under very low pressure. A single surge of electricity is sent through the gas contained in a doughnut-shaped tube to "excite" it or raise its temperature.

By examining light emitted by the excited hydrogen, they have detected the beginning of contraction or pinching. Exactly what temperatures are obtained is not yet known, since their experiments are still in the preliminary stages.

The pinch effect was first noted by E. Northrup in 1907, when he was studying conduction of electrical currents in liquid mercury. Its application to gaseous discharges is an entirely new viewpoint that may, it is hoped, one day lead to controlled power from fusion of light elements.

Science News Letter, January 14, 1956

MEDICINE

Antibiotic Can Act as Deodorant

► AN ANTIBIOTIC, or mold remedy, that stops staphylococci germs can also stop under-arm odor, Drs. Walter B. Shelley and Milton M. Cahn of Philadelphia report to the *Journal of the American Medical Association* (Dec. 31).

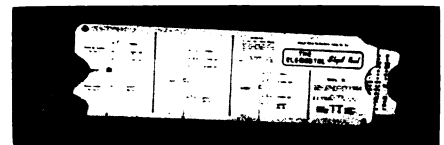
The antibiotic is used in a cream and applied daily like other cream deodorants. Neomycin is the antibiotic tested by the Philadelphia doctors. It works because it stops germs which recently have been found to cause odor through their action on body sweat.

The Philadelphia doctors suggest the antibiotic deodorant for "those few" who cannot tolerate the standard aluminum salt deodorants which are usually "highly effective."

Science News Letter, January 14, 1956

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VETERINARY MEDICINE

New Worm Medicine

► DOG OWNERS, poultrymen and hog raisers will welcome the announcement made to the American Association for the Advancement of Science meeting in Atlanta that a simple and safe way of removing worm parasites has been found after a search of many years.

The drug utilized is highly soluble piperazine citrate. It is simply added to the drinking water. It is a preventive as well as a treatment.

Drs. R. F. Shumard and D. F. Eveleth of the North Dakota Experiment Station, Fargo, found that the drug and other piperazine salts are not only extremely effective against large roundworms but are not toxic even when given in dosages 10 times those actually needed.

Money-saving use of the new anthelmintic in pets and domestic animals is expected. It can be applied to some of the parasites of sheep as well.

Fear that treating foods with atomic radiations to preserve them would cause them to become poisonous seems to be unfounded. Two chemists of the Army Medical Nutrition Laboratory, Denver, Merrill S. Read and Dr. Herman F. Kraybill, reported that various sorts of food heavily treated with gamma radiation did not impair the growth of test rats and also gave no toxic symptoms. Food sterilization, rivalling freezing, canning and drying, will provide a use for waste atomic power "debris" that give off powerful radiations. It was predicted that food sterilization by atomic radiation would be a multimillion dollar business in the near future.

Science News Letter, January 14, 1956

More than 40 nations are participating in the *International Geophysical Year* program (1957-58), described as the most extensive scientific effort ever made.

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