

lasts. However, they are no longer monsters to be dreaded, but like conquered genii in ancient Oriental tales, they become the servants of those who have bested them, steadily stimulating the production of substances that protect against new invasions.

This theory of immunity following virus diseases was presented to the meeting by Dr. Thomas M. Rivers, director of the hospital of the Rockefeller Institute, New York City.

Other diseases caused by viruses leave the recovered patient immune for only a relatively short time. This is the case, for example, with influenza and the common cold. Following these maladies the body does rid itself of the virus. As a consequence, it has no continuing stimulus to produce immune substances, and when a new infection attacks there is no effective defense ready to repel the invader.

*Science News Letter, October 4, 1941*

## Held Together by Chemical

**WHAT KIND** of perfume does Paramecium use?

Paramecium is a microscopic one-celled animal that swims in stagnant waters. Its aggregations, forming the most elementary kind of social groupings, are held together by chemical attraction, more irresistibly than a "swell" is drawn to his belle by the exotic scent that breathes from her dainty person.

The chemical basis of this simple society was described by Dr. H. S. Jennings of the University of California at Los Angeles.

The water around an individual Paramecium becomes faintly acid, Dr. Jennings said. Another Paramecium, chancing into this acidified zone, becomes unable to leave it. Every time it approaches the boundary, it is impelled to turn back. Others swim into the charmed circle, and are held as if by the fumes from an ancient magician's potent philtre.

Dr. Jennings found that he could reproduce this chemical social attraction simply by introducing a bubble of carbon dioxide into the water. It set up a charmed chemical boundary just like that of the Paramecium's natural secretion, which the little animals could enter but which they could not leave. Since carbon dioxide is a product of respiration by Paramecium as well as by Man, it is just possible that the only chemical foundation for the charmed social circle in the world of the waterdrop is nothing more than an attractive "breath".

*Science News Letter, October 4, 1941*

## PHYSICS

# Cosmic Rays Created by Self-Annihilation of Atoms

## Discovery of Identifying Bands for Five Elements Critical for Hypothesis Proposed by Prof. Millikan

**COSMIC RAYS** are created by the suicide of atoms in the loneliness of interstellar space, in the same manner that light is created by the partial self-destruction of atoms in the densely packed interiors of the stars. Prof. Robert Andrews Millikan, Nobelist of the California Institute of Technology, proposed this hypothesis at the symposia arranged by the American Association for the Advancement of Science in connection with the fiftieth anniversary celebration of the University of Chicago.

The hypothesis, said Prof. Millikan, rests on discoveries made in five recent research projects by his fellow-workers in the Norman Bridge Laboratory of Physics. In sum, these researches indicate that atoms of five elements are far more abundant in interstellar space than those of any other element, and that such atoms are capable of transmutations, giving rise to high-speed particles like those that constitute cosmic rays.

The broad surface of the earth itself is the spectroscopic screen on which should be spread the distinctive bands of cosmic rays, each characteristic of the element from which it originated. If they actually are found distributed in accordance with Prof. Millikan's prediction, this will constitute substantial evidence in favor of its validity. They are predicted as being thus distributed because the magnetic field of the earth should bend each band aside in proportion to the energy or speed of the incoming rays.

The five elements for which the five identifying bands are sought are: helium, carbon, nitrogen, oxygen and silicon. At least partial evidence has already been discovered that some of the bands exist, Prof. Millikan stated. The discovery or non-discovery of the remaining ones will be critical for his hypothesis.

*Science News Letter, October 4, 1941*

## Cosmic Rays Are Protons

**COSMIC RAYS** are protons, "hard," high-speed atomic particles, when they arrive at the outer boundary of the earth's atmosphere, it is indicated by experiments reported by three Univer-

sity of Chicago physicists, Dr. William P. Jesse, Dr. Marcel Schein and Dr. Ernest O. Wollan. On striking the atmospheric atoms, they give rise to the "middle-weight" particles known as mesotrons. Evidence supporting this conclusion was obtained by sending recording instruments aloft attached to free balloons that reached heights as great as 14 miles.

*Science News Letter, October 4, 1941*

## Earth Mostly 9 Elements

**NINETY-NINE** per cent of the weight of the earth is made up of only nine of the 88 known elements, Prof. Henry Norris Russell, Princeton University astronomer, told the meeting. All the rest have only one per cent to divide among them.

The same group of elements also make up the bulk of the other objects in the visible universe: stars, nebulae, comets, and the meteorites that bring to us the only samples of the cosmos that we can actually get our hands on. Proportions are different, however: hydrogen, for example, makes up only one-half of one per cent of the accessible earth-parts, whereas it constitutes the bulk of some of the stars.

*Science News Letter, October 4, 1941*

## PSYCHOLOGY

## Women More Susceptible To Glare At Night

**THE HIGHLY** debated question of whether men or women are the better automobile drivers has been studied from a scientific viewpoint by researchers at the University of California. Tests devised by Dr. C. W. Brown, associate professor of psychology, show that men are probably better drivers, at least at night.

Glare blindness resulting from facing oncoming headlights is doubtless responsible for many of the after-dark highway accidents.

"During the normal hours of darkness, from 6 p.m. to 6 a.m., deaths from

automobile accidents increased 18% from 1930 to 1939," the psychologist pointed out. "For the same period deaths during the daytime decreased 20%. In 1939, and for several years immediately preceding, about 60% of deaths resulting from motor vehicle accidents occurred at night."

A simple apparatus developed by Dr. Brown and now used by the State Department of Motor Vehicles, tests the extent of glare blindness in individuals and shows how quickly they recover normal night vision after lights pass.

Tests of 150 University students, conducted by Dr. Brown and his assistants, H. P. Torkelson and L. B. Fisk, psychology students, showed that the average recovery time after glare blindness was 25.2 seconds, with a speed record of 5 seconds by one student and a prolonged blindness of 70 seconds by another. Men average a normal vision recovery time 10 seconds less than women.

This record does not necessarily mean a normally slower reaction in girls but may have been the result of a lower vitamin A consumption in the women's diet, since lack of vitamin A is known to be responsible for night blindness.

Students taking the test who reported difficulty in night driving were found to be slow in glare blindness recovery.

*Science News Letter, October 4, 1941*

#### PSYCHOLOGY

## Students Taught to Control Skin's Electric Resistance

**Y**OU can be taught to control such an apparently unconscious and involuntary thing as the electric resistance of your skin, Dr. R. H. Henneman, psychologist of the College of William and Mary, has found.

Emotion may change your skin resistance just as it does the rate of your heart beat or the dilation of your eye pupils. But this change is ordinarily beyond your control and would betray you if you submitted to the so-called lie detector.

Dr. Henneman has "conditioned" eight persons so that they can voluntarily change their own skin resistance by silently saying the signal "humdum" to themselves, he told the American Psychological Association. After first thinking of this word at the same time they received the real emotion stirring signal of an electric shock, they could later produce the skin resistance change merely by giving themselves the silent word signal.

*Science News Letter, October 4, 1941*

## New Machines And Gadgets

### Novel Things for Better Living

Oriental hog bristles, used for the finer brushes, having become scarce, nylon bristles have been substituted for many uses. A recent example is a rotary brush for pasting wrappers on packages. They are said to last nearly twice as long as natural bristles. They do not fray or split, retain their stiffness in hot water, and dry very quickly. Another advantage is that they can be accurately made of a specified diameter, and all of the same diameter throughout, an important point to which the Oriental hog pays no attention.

A combined tie clip and nail file is the subject of three patented designs. The nail file composes the part that enters the enclosing clasp. In one design the combination when closed is made to look like a miniature golf bag with the tip of a golf club sticking out. In another the combination is made to look like a miniature gun in its case with the butt of the gun protruding. The third is a tiny swordfish, the tail of which forms the handle of the nail file.

Your trigger finger will always be available for use even though you wear thick gloves if you make use of a glove with a slit along the forefinger. A mitten with this convenient provision was invented by the Duchess of Windsor, who realized that a man in battle would find it extremely awkward and also chilly to have to remove the entire mitten whenever he had to use his forefinger. Of course, he might not always need it for pulling a trigger. There are other uses of a forefinger. An improvement on this device has recently been granted a patent. It consists of a tiny slide fastener, with which the opening may be closed, and the forefinger may lie snug and warm until its services are again required.

Dry ice is used in a novel method of testing sealed containers for leakage. Pellets of the dry ice are put into the containers which are then sealed and immersed in water. Dry ice is frozen carbon dioxide, the gas that causes the soda pop to fizz. In the warm surroundings the dry ice evaporates into the original gas, and any leakage will be disclosed by bubbles rising in the water.

This oxy-acetylene torch is cutting a 45-degree bevel on a ½-inch steel plate at the rate of 16 inches per minute. Cutting a bevel is more difficult than vertical cutting. More heat is required because some of the heat bounces off and does not penetrate to the same extent as when the flames strike the

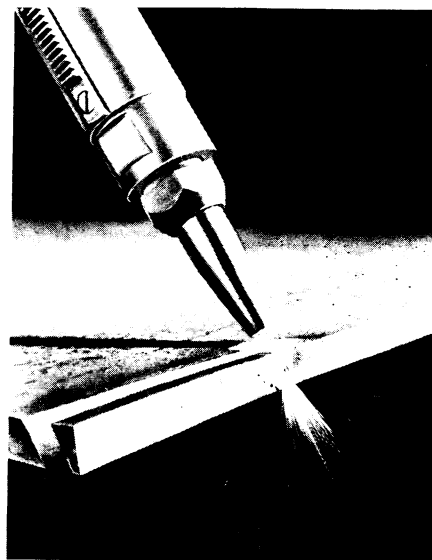


plate at right angles. The torch must be moved very uniformly, for otherwise ridges will be formed. Too much heat and too little heat produce other defects.

Tonsils are made plainly visible by the use of a new tongue depressor by which light is "piped cold" from an outside source to the throat while the patient says "Ah." This conveyance of the light is made possible by the wonderfully clear methacrylate resin. The depressor is simply a strip of the plastic 3½ inches long, ⅝ inch wide, and ⅛ inch thick. It serves both to depress the tongue and to convey the light. The latter is supplied by a cylindrical flashlight battery which serves also as a handle. The light is conveyed from the bulb to the mouth through the substance of the plastic by means of internal reflection. Very little leaks out at the sides, so that nearly all comes out at the farther end. This method of piping light, much used by physicians and surgeons, is now being applied in industry to examine inaccessible parts of machinery.

*If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St. N. W., Washington, D. C., and ask for Gadget Bulletin 73.*

*Science News Letter, October 4, 1941*

## ● RADIO

*Thursday, October 9, 3:45 p.m., EST*

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. C. I. Post, of the Vitamin Division of the National Oil Products Company, will discuss the aid given by vitamins in national defense. Listen in each Thursday.

*Monday, October 13, 9:30 p.m., EST*

Science Clubs of America program over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.