

Do You Know?

In Greece, *sheep* are raised primarily for milk.

Male *tigers* sometimes weigh 600 pounds; females seldom exceed 300 pounds.

Scientific research has been called the fourth dimension of industry.

Good sources of *vitamin A* include liver, sweet potatoes, carrots, spinach, greens, apricots, tomatoes and peas.

Pre-emergence weeding is a new phrase in gardening; it is the growing practice of applying weed-killing chemicals to planted fields before the crop plants have come up.

Motor vehicle *drivers* who drive at a steady rate, at moderate speeds, and accelerate gradually get the best mileage from the gasoline used.

People who cut timber without permission on land not their own are called "*grandmawers*" in the Ozarks, the mountain area of Missouri and Arkansas.

Railroads carry approximately 70% of America's *freight*; the rest is carried by trucks, inland water boats, pipelines and aircraft.

The towering Empire State Building in New York City is being used in research on *lightning*; it is struck by lightning many times each summer, often as frequently as 48 times.

The *Stillingia tree*, also known as the Chinese tallow tree, grows in the southwestern part of the United States, including Texas, and produces an oil-bearing seed which yields an oil suitable for use in paints and varnishes.

my sister with a brick and felt bad."

Between 12 and 18, school failure, being refused desired objects, loss of friends, quarrels with parents, breaking up with boy friends, inferiority feelings, seeing accidents and lack of popularity were among the most often remembered.

Reporting their findings in the *JOURNAL OF GENETIC PSYCHOLOGY*, the scientists suggest that the 6- to 12-year group may be forced to adapt too rapidly to social rules and conventions. Problems of the older group, they believe, may be partially blamed on "the educational, social and economic philosophy" of today. Parents and teachers ought to do more to build up a youth's sense of personal worth in this stage, the investigators urge.

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CHEMISTRY-PHYSICS

Non-Radioactive Tracers

➤ A RADAR research discovery during the war now makes it possible to trace chemical elements in some parts of the body without the use of hazardous radioactive isotopes.

The microwave spectroscope uses waves of the same length as radar to detect even tiny amounts of chemical elements.

Stable isotopes of elements, which differ only in atomic weight from the usual form of the element, can be fed to humans, animals or plants. The element may end up in the skin, hair or nails of an animal being tested, or in any part of a plant. It must be in some part that is detachable to be traced since the spectroscope can only be used on a small specimen. The part being tested is placed in the spectroscope where it will intercept microwaves and cancel out those frequencies corresponding to the isotopes of elements it contains.

Development of the microwave spectroscope is the result of work done at the Research Laboratory of Electronics of the Massachusetts Institute of Technology.

Radioactive isotopes which have been used to trace the distribution of elements

and compounds in living organisms have a much wider range of uses than the stable isotopes. However, these isotopes are dangerous to life if given in too large amounts. Radioactivity poisoning, which causes burns and in larger doses, disintegration of cells, might result.

Radioactive isotopes are also more expensive. They are used in such experiments because they can be traced with a Geiger-Muller counter.

Microwave research began during the war when scientists working on radar discovered that certain wavelengths used in radar were absorbed by gases in the atmosphere. At the Radiation Laboratory at M. I. T. and at Columbia University, projects were started to find out what gases interfered with what wavelengths. It was found that water vapor and oxygen absorbed microwaves in such a way that they defined the limits of usable radar waves.

After the war these discoveries led to work in the detection of gases by microwave spectroscopy and from there to the use of these waves in exploring matter.

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CHEMISTRY

Chemists' Newer Methods

➤ CHEMICAL INDUSTRY is using cool and quiet processes to replace the fire and brimstone that are the traditional accompaniments of the chemist, the magazine *CHEMISTRY* says in its July issue.

Methods called catalysis and ion exchange are supplementing the refining by fire and the distillation by heat that have come to be associated with chemical processes. The editorial comment in this *Science Service* publication continues: Doubtless the flames, the smells and the noises issuing from primitive laboratories fostered the legend that the experimenter within had sold his soul to the devil.

Early chemists had few processes to work with. Through the verbal mists they created with their obscure language it is occasionally possible to make out the alchemists' directions and recognize the processes they were trying to carry out. The most surprising thing about them is the round-about way they worked.

Trained in metal refining, their work was all with fire. Solution and precipitation "in the wet way" was still undreamed of.

It was an important step ahead when the alchemists discovered distillation. The process must have seemed mysterious to them, and absurdly simple.

In the same way, today, old fogies may still be found who scoff at new methods which take advantage of small surface forces—catalysis and ion-exchange. "What's

so wonderful," they ask, "about just running a solution through a pipe?"

The steps in development of chemical industry are not unlike those in the development of machine design. As the creaks and bangs of primitive machines have been replaced by the purr of the modern motor, the violence of early chemical processes is being superseded by methods which take advantage of quieter forces.

Catalysis often persuades chemicals into combinations that heat and pressure can scarcely force them into. Ion exchange accomplishes, seemingly without effort, what distillation, with its expensive energy changes, balks at.

Soon photosynthesis will join the list of methods which will replace the alchemists' Little Tophet with a chemical factory as quiet and restful as nature's factory, the cool green forest.

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The age of *wild quail*, a favorite game bird in much of the United States, can be quite accurately told by experts from their size and their feather development.

Some American cities are washing *streets* with a mixture of one gallon of a commercial detergent made from petroleum added to each 2,000 gallons of water; the application leaves a thick layer of foam on the surface which lasts for 30 minutes.