



SUNSPOTS

This great disturbance visible on the face of the sun on July 7 is the largest group of sunspots seen in recent months. It was photographed at the U. S. Naval Observatory.

AERONAUTICS

Autogiro Mail Line Opens at Philadelphia

AMERICAN aviation hangs up another first with the establishment of the world's premier "windmill airplane" airline, which has started shuttling airmail between Camden airport, the Philadelphia flying field, and the Philadelphia post office.

Not only does Eastern Airlines' "land-on-a-dime" Kellett autogiro haul 400 pounds of mail in five minutes a distance a mail truck requires a half hour to negotiate, but it promises a solution to the big city airport headache as well. The autogiro lands on the post office building roof.

With mail successfully ferried today, passengers will be carried just as quickly and easily tomorrow. Autogiros cannot now carry loads large enough to accommodate the number of passengers that can be fitted into an airliner, but the autogiro is a young bird yet. It will grow up just as its conventional airplane sister has.

Large cities are now faced with two unpleasant alternatives in building their airports because of the space required for takeoff and landing of the larger

planes. The city must either pay high prices for an airport site handily located or passengers have to put up with a 30- to 50-minute car or cab ride from business districts.

Getting to and from an airport can actually take more time than making the flight itself, particularly for shorter distances. For example, a New York to Philadelphia flight takes about 40 minutes. But getting to Newark airport and from the Camden airport requires more than an hour. A man in a hurry under such conditions can do better by taking a train.

Science News Letter, July 22, 1939

Experiments at Cornell University show that two species of mosquitoes can transmit fowl pox to healthy birds.

There are only about 600 miles of divided highways in the United States, to separate oncoming streams of traffic.

Chemists have discovered that with the proper strength of brine southern cucumbers can be made into firm pickles.

ASTRONOMY

Huge Sunspot Cluster Sweeps Across Sun's Face

A HUGE cluster of sunspots, so large that more than a dozen earths could be dropped into them, have been sweeping across the face of the sun, it is disclosed on photographs taken at the U. S. Naval Observatory. This is the largest group seen in recent months.

Three of the spots, with smaller satellite spots nearby, were lined up in an east-west direction across the sun. Not far away was a fourth group of three small spots arranged in the form of a triangle. All of them passed sun's meridian line about July 8 and disappeared off the western edge of the sun about July 15.

If they keep their shape they should reappear again on the sun's eastern side near the end of July. The period of rotation of the sun, which determines the speed with which sunspots appear to move, is about four weeks as seen from the earth.

Science News Letter, July 22, 1939

ENGINEERING

Create Mechanical Power From Burnt Fuel Gases

THE ENGINEER'S answer to fears of wartime bombings, that would cripple city power plants, is a new type gas turbine described at the meeting of the American Society of Mechanical Engineers at San Francisco.

Gas turbines fulfill the engineer's dream of turning the energy of fuel into mechanical power without the use of cylinders and pistons or steam boilers and all the other necessary parts of present day power units, Dr. Adolphe Meyer, widely known engineer of the Brown, Boveri and Company, Baden, Switzerland, said.

In the gas turbine the burned gases from the fuel strike the blades of spinning turbine and generate the power.

As applied for a bomb-proof power station in the city of Neuchatel, Switzerland, a 4,000 kilowatt gas turbine generator is buried deep underground in a tunnel only 60 feet long, 17 feet high and 26 feet wide. Since no water cooling is required for this new type gas turbine, the entire emergency wartime unit is sealed except for fuel and air intake lines and openings for exhaust gases and an electric power cable. Gone from the eyes of airplane bomb sights are the towering stacks and great buildings of

steam turbine electric plants now so common in cities.

Gas turbines too are finding peacetime uses. A powerful 2,000 horsepower locomotive that is only 60 feet long has been built for the Swiss Federal Railway. In contrast a new steam-electric locomotive recently built for the Union Pacific Railroad generates 2,500 horsepower but

is over twice as long—125 feet.

Two industrial uses are in steel and chemical plants where large amounts of waste gases are created that can now be turned into power. The same situation applies in oil fields where now wasted natural gas can be converted by gas turbines directly into electrical power for easy transmission and use.

Science News Letter, July 22, 1939

PHYSIOLOGY

Find Enzyme That Protects Live Cells From Poison

Blood Cells Live After Dose of Potassium Cyanide When It Is Followed By Horse Liver Catalase

THE ISOLATION and crystallization of an enzyme of horse liver, a catalase, important because it protects living cells from poisoning and destruction by hydrogen peroxide which they form, has been announced at Cornell University.

Success in this research, elusive for many years to prominent Swedish and German chemists, has come to Dr. Alexander L. Dounce, department of biochemistry, and Orville D. Frampton of the graduate school.

Horse liver catalase is an important enzyme which protects all living cells from hydrogen peroxide, by-product of tissue oxidations. Hydrogen peroxide is a poison that destroys the cells.

There isn't room in the same test tube for certain combinations of horse liver catalase and hydrogen peroxide. The power and fast action of the catalase can be seen by watching a small quantity of it force hydrogen peroxide up the side of the test tube and over the top. In another demonstration, two flasks of diluted blood were placed side by side. The liquid in each was bright red. Into one flask was poured a small quantity of a deadly poison, potassium cyanide, and immediately afterward horse liver catalase was added. The liquid remained a bright red, foaming a little at the top. The catalase had destroyed the hydrogen peroxide formed when the potassium cyanide attacked the cells in the blood.

Into the other flask potassium cyanide was poured, but no catalase "policeman" followed to arrest the hydrogen peroxide which was formed, and the living cells were poisoned and destroyed. The liquid turned brown immediately.

Two years ago, Prof. James B. Sumner and Dr. Dounce obtained crystalline beef

and lamb catalase. These two catalases are probably identical, but the horse catalase is more active. Undoubtedly if Sea Biscuit, a champion race horse, possessed only beef or lamb catalase he would not be able to run half as fast, but a slow-moving lamb or cow does not require such an active enzyme as the horse. The amount of catalase in an animal or plant appears to be related to the activity of the organism.

The horse liver enzyme is the only one thus far crystallized that has been found to contain iron.

Science News Letter, July 22, 1939

CHEMISTRY—PUBLIC HEALTH

Overcoming Health Hazards In Chemical Industries

MUCH has been said about the dangers that menace the health of workers in chemical industries—dangers which may increase with each new process that is developed, each new chemical that is brought into use. Now a chemist, Dr. Henry Field Smyth, of the University of Pennsylvania, tells how to overcome these health hazards in chemical industries.

"It is possible," he declares in a report to the American Institute of Chemists, "to use any essential chemical in industry with safety, provided we learn its potentialities of harm and how to recognize early harmful action, and provided we are willing to pay the price—in money, in equipment and in vigilance—to make and keep conditions safe."

Eight protective measures are discussed by Dr. Smyth. First is substitution of a similar but less toxic material. This

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the Jesuit Seismological Association resulted in the location of the following preliminary epicenter:

Wednesday, July 5, 5:41.2 p.m., EST

In region of Tonga Islands, about 600 miles south of Samoa in South Pacific. Latitude, 24 degrees south. Longitude, 179 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL, June 17.

is not a good method, he says, pointing out that it is much better to learn how to use safely a hazardous material than to discard it for a possibly less useful substitute often of unknown toxicity.

Second measure is installation of exhaust ventilation adequate to remove toxic materials at the point of production before they have a chance to penetrate working atmosphere.

Third measure is isolation of processes so as to avoid the risk of general plant exposures.

Fourth, shorten unnecessary exposures of unprotected men and alternate dangerous jobs with safe ones.

Fifth, provide for personal protection of workers by adequate respirators, positive pressure air helmets, protective non-absorbent clothing and protective skin applications.

Sixth, see that safe devices remain safe and are kept in good order.

Seventh, examine employees before employment and exclude those likely to be particularly susceptible.

Eighth, have periodic physical examinations of employees to detect early signs of trouble in time to remedy it.

Science News Letter, July 22, 1939

A doorway in a ruined building at Karnak, Egypt, is 60 feet high and 23 feet wide, and the double doors must have weighed 12 tons each.

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