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

● 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.

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 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 nonabsorbent 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.