what regions the fewest earthquakes have occurred in the past, and if you can extrapolate from history and call it prophecy, you are entitled to such comfort as that will give you.

The U. S. Coast and Geodetic Survey has just issued an earthquake history of the United States. The division into two sections, one for California and western Nevada, the other for all the rest of the country including Alaska, is by itself eloquent of the uneasiness of the earth in the region between the Sierra and the sea. Yet numbers of shocks are not necessarily significant; the great majority of California's earthquakes are mere dish-rattlers. Only, scientists are interested in little specimens as well as big ones, so they record them all, regardless of intensity.

Only three states in the Union have histories of no recorded earthquakes at all: West Virginia, Wisconsin and North Dakota. Four have only one each, but with a difference. The single shocks recorded for Rhode Island and the District of Columbia were insignificant, whereas Mississippi and Louisiana have each had a quake classified as of intensity 7 on the seismologist's scale—severe enough to upset furniture and knock down plaster.

Delaware and Iowa have felt only two slight earthquakes apiece; Minnesota two, classed as "moderate." Quakeless North Dakota's sister state, South Dakota, has felt the shock of six earth movements. Texas, with its enormous area, might be expected to have a high place in the column. Actually, however, only seven earthquakes are listed for the Lone Star State.

*Science News Letter, April 1, 1939*

AERONAUTICS

## WPA Built 154 Airports, Improved 494 Others

THE WORKS Progress Administration in three and a half years ending Dec. 31 last has built 154 new airports, improved 494 others and placed hundreds of air navigation aids, WPA Administrator Col. F. C. Harrington announced.

The WPA has spent more than $112,000,000 on such projects and has contributed the bulk of public aviation ground facilities erected since the WPA was established in 1935. Nearly 38,000 men are now at work on further projects.

*Science News Letter, April 1, 1939*

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A North Carolina company is making office furniture out of pecan wood.

PHYSICS

# Confirm Release of Neutrons From Splitting Uranium Atoms

FRENCH scicntists have confirmed the American di overy that splitting uranium atoms, releasing their enormous amount of atomic energy, also give off neutrons in the reaction.

This liberation of neutrons from uranium atoms split by impact with other neutrons, is most important because it provides a mechanism which, at least theoretically, might serve to keep the chain of splitting continuing and hence produce a continuous release of atomic energy.

Scientists F. Joliot, H. von Halban, Jr., and L. Kowarski of Paris report the discovery. (*Nature*).

Prof. Joliot and his co-workers find that neutrons (neutral atomic particles) from a source of radium and beryllium can split uranium atoms placed nearby. Along with the energy released additional neutrons are given off in the process. This discovery is comparable with, and a confirmation of, the announcement (See SNL, March 11, March 18) that scientists at the Carnegie Institution of Washington's Department of Terrestrial Magnetism had been able to observe the same reaction in atomic transmutation.

These American scientists, Drs. Richard B. Roberts, R. C. Meyer and P. Wang, found that the secondary neutron emission from the uranium splitting was delayed by some seconds. There is no indication whether the new French experiments also describe a delayed effect or whether the emission of the neutron happened immediately.

Also the American workers would like to know if the experiment really was done with the neutrons obtained from radium-beryllium sources which have energies of 480,000 electron volts, or whether these 480,000 electron volt neutrons were slowed down with large paraffin blocks, then allowed to strike the uranium and split it.

Uranium splitting with these "slow" neutrons is nothing startling now, for it has been done in many laboratories in the few short weeks since the initial discovery. Splitting with 480,000 electron volt neutrons is something else, however. At Carnegie Institution such neutrons were tried but no evidence has yet been found of uranium splitting for these energies.

*Science News Letter, April 1, 1939*

AERONAUTICS

# Fire Aloft May Be Conquered By Safe Fuel and New Engines

FIRE aloft, aviation's most fearsome hazard, appeared nearer substantial elimination by a special safe airplane fuel and engines similar to present types to use it.

The fuel may even make possible larger and more powerful engine cylinders than those of today.

A separate approach from the yet unproved Diesel engine, a petroleum fuel, with an octane rating comparable to the best grades of gasoline but with a high enough "flash point" to prevent explosions, has been found and can be burned efficiently in spark-ignition motors of modified design, Frank C. Mock of the Bendix Aviation Corporation told the Society of Automotive Engineers.

The fuel itself, which has an octane rating of 87, the same as the gasoline used for cruising airliners, was first found more than a decade ago, Mr. Mock related, in the hunt for a safe high-powered petrol for the motors that drive airships. It cannot be used in an ordinary engine because it does not vaporize as easily as gasoline.

Interest in lighter-than-air craft at an ebb in the United States, interest in the special fuel likewise died, he said. But in the last few years, as fire remained the single most destructive untamed force in aviation, scientists have returned to the attack. The refining companies have since added several other fuels of similar type. Mr. Mock cautiously estimated that five more years of intensive development work are still necessary.

The familiar carburetor will have to

be replaced by special fuel injectors to handle the petroleum product, Mr. Mock declared.

Chief modifications of a standard engine are to direct the high "flash point" fuel, which has a density 15 per cent. greater than gasoline, toward hot parts of the cylinder so that it may be readily vaporized. Starting an engine powered by it is at present a difficulty, because of the need for vaporizing the fuel, but the type of ignition employed to start house furnaces may prove satisfactory, the Bendix engineer continued. Suitable injection pumps, control devices and other accessories are already available to the engine manufacturers who may desire to go ahead with the development.

Use of the new fuel may at the same time help solve two cooling difficulties faced by engine designers, and lead to larger engine cylinders. Heat needed for vaporization can be absorbed from otherwise overheated exhaust valves and pistons. Cylinders and pistons large enough to make 18 cylinders do where 24 would now be required may thus be made possible, Mr. Mock pointed out.

*Science News Letter, April 1, 1939*

PUBLIC HEALTH

# Refugees and Air Raid Plans Bring Europe Health Problems

## League Health Section Anticipates Coming Worries; International School for Advanced Study Planned

REFUGEES; plans of all European governments to move city dwellers to the country as protection against air raids; and nutrition are the most important European health problems now facing the Health Section of the League of Nations, Dr. Ludwig Rajchman, recently retired director, told members of the Pan American Medical Association.

The refugee health problem involves hundreds of thousands in Europe and millions in Asia, Dr. Rajchman said.

The Health Section of the League of Nations, he explained, can help European governments plan extension of sanitary and public health services in rural areas so as to prevent epidemics or other threats to health that might arise when large numbers of urban civilians are moved to the country. Such moves are already planned by all the governments as precautions against loss of life in the civilian population during air raids.

One function of the organization, he said, is to give governments advice of this sort on special health problems or in connection with formulation of health policies. Another purpose of the organization is to think out in advance problems which may come before the national health services and to be ready to advise on such problems.

As part of its activities, the League has decided to organize a conference on rural health for all the Americas, to be held in Mexico City before the end of the year.

In view of the importance of the League's work in bringing together public health leaders for round table discussions of present and future problems, the French government has offered to set up in Paris an International School of Advanced Study in Public Health. Necessary appropriations, Dr. Rajchman said, have been voted by the French chamber of deputies and now await approval of the French Senate which is expected shortly. Unless grave complications arise in Europe, the school will probably be set up this year.

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TECHNOLOGY

# Sterilizing Lamp Tenderizes Tough Hamburger Beef

MAKING a "poor man's filet mignon" out of tough hamburger beef is the newest feat of modern industrial science.

Germ-killing ultraviolet rays plus an application of air conditioning now make it possible to tenderize in a few days tough cuts of beef which formerly could be ripened only by weeks of "hanging." This method, worked out over a period of four years by scientists of the Mellon Institute for Industrial Research, enables the raising of all types of beef by one grade in the scale of ratings of palatability.

Trick of the method, devised by Dr. Marion D. Coulter, industrial fellow, is to use high temperature and humidity to bring about quickly the chemical enzyme reactions that turn the tough connective tissue in meat into a gelatinous material which is easy to bite through. It is the breakdown of the connective

*TENDERIZING RAYS*

***The germ-killing ultraviolet lamp above with air conditioning, cuts the time of the old fashioned "hanging" for making meat tender. Inspecting the device are its developers, Drs. Marion D. Coulter and H. C. Hentschler.***