

enormously destructive explosive effects on whatever they hit unless it is adequately protected, they did not last long enough to set fire to combustible targets, only leaving a scorched hole. The after-stroke of "hot" lightning generates temperatures only half as high as the main stroke, but it lasts between 100 and 1,000 times as long.

The long-duration charge is produced by means of additional capacitors or a transformer from which the charge is "soaked" through a series of resistance and inductance coils in oil and permitted to follow the initial high current discharge relatively slowly.

In demonstrations, "hot lightning" fused sand in a fiber tube, set fire to cotton cloth, and burned holes through copper sheets varying from one thirty-second to one-sixteenth of an inch thick.

*Science News Letter, May 27, 1939*

#### MEDICINE

### Cancer Control Attempted Through Use of Insulin

**T**HE POSSIBILITY of controlling cancer in the future by means of insulin, now used in diabetes treatment, is hinted in two reports to the Society for the Study of Internal Secretions.

None of the work has yet reached the stage where insulin can be recommended for human cancers. But the studies show that scientists are trying all possible methods in the search for more weapons to fight this great killer.

A University of Rochester group studied two lots of rabbits which all had tumors of the same average size in the beginning. One lot got insulin and the other did not. There were always, even in the non-insulin group, a few spontaneous regressions of the cancers. But there were always a few more regressions of the malignant growth in the rabbits that got insulin. The insulin-treated animals always gained more weight than the controls and it was suggested that this improved nutrition might have been the determining factor in reducing the size of the cancers, rather than any direct effect on their growth by the reduced amount of sugar in the blood.

The attempts at controlling cancers in animals, with a degree of success in some cases, were described by two groups of investigators: Drs. John R. Murlin, C. D. Kochakian, T. B. Steinhausen and R. Ryer of the University of Rochester, and Drs. Milton O. Lee, William Freeman, R. G. Hoskins and Helen M. Levene of Harvard Medical School.

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#### AERONAUTICS

## Air Giants of Future May Carry Own Oil Refineries

**A**IR GIANTS on the skyways of the future may carry their own petroleum cracking refineries aloft, it was suggested at the meeting of the American Petroleum Institute by S. D. Heron and Harold A. Beatty of the Ethyl Gasoline Corporation.

Increasingly aviation is demanding more powerful fuels, said the oil experts, but at the same time it is rightly asking for safer fuels which will decrease the menace of fire.

Safety fuels that ignite less easily and which burn more slowly than gasoline are the answer to this need. However, such fuels can be burned either in Diesel engines or in spark-ignition engines only after the latter are in operation.

"Engines operated on safety fuel require either gaseous or volatile liquid fuel for starting," declared the petroleum experts. Unless these starting fuels are carried with great precautions they may greatly increase the low fire risk inherent in the safety fuels. If they are carried in heavy tanks like those used in storing oxygen under pressure they add weight.

"It might be practicable to install a small electrically-heated cracking unit to crack either safety fuel or engine lubricating oil to a fixed gas (for starting)," the experts said.

"Even though such a unit were of considerable size and weight, it still would probably be lighter than special pressure tanks for volatile or gaseous fuels; and it would avoid the manufacture, distribution, and storage of special starting fuels (in event that fuels other than gasoline were used for this purpose)."

"The average layman has been led to believe that the use of Diesel engines is practically a cure-all for this problem (fire hazard), but to the aircraft operator or designer the solution does not appear to be so delightfully simple," they added.

Current handicap of aircraft Diesels is that no 1,000 horsepower units have yet been seen in the United States, whereas spark-ignition engines giving 1,200 and 1,500 horsepower are commonplace and 2,000 horsepower units are now in demand, the petroleum experts concluded.

*Science News Letter, May 27, 1939*

#### AERONAUTICS

## Pick-Up Airmail Service For Towns With No Airports

**O**NE of aviation's fondest dreams—of a day when all first class mail goes by air—moved a step nearer realization when a United States airmail plane dropped low over ten Pennsylvania, Ohio and West Virginia towns for the first time in their histories to launch an experimental pick-up airmail service.

Carrying no revenue load except mail, a fleet of five trim monoplanes of All-American Aviation, Inc., will in a few weeks' time be serving 56 cities in four states with speedy letter service such as no small American city has ever had.

If the novel experiment, backed by Federal funds to the extent of 43 cents a mile on one route and 32 cents on the other, is successful during the course of the next year, and Congress approves, it will be extended to hundreds of other

cities throughout the United States and rapidly bring nearer the day when first class mail all goes the fastest way possible—through the air.

Several unique devices developed by an Irwin, Pa., dentist who became interested in aviation, Dr. Lytle S. Adams, underlie the new service which dispenses with the necessity of making landings to pick up letters and other packages, or to deliver them.

A mail bag will be slung between two masts 40 feet high. As the mail plane approaches, an operator aboard the ship will lower a 65-foot cable at the end of which is a grasping hook, and at the end of another 20 feet, a container of mail for delivery to that town.

As the bag being delivered touches ground, a special device will sever the copper wire by which it is fastened. An

instant later, the hook on the cable will snare the rope holding the container of outgoing mail. Service is thus possible in towns too small to afford excellent airports.

Another important aeronautical promise is also implicit in the All-American service, which is headed and financed by Richard C. du Pont, glider pilot. For, if these planes which carry no passengers can be made to pay for them-

selves, and if all first class mail ever does go via air, a day will come when passengers and mails will go in separate planes.

Two routes are to be operated, covering the 56 small cities. One will go from Philadelphia to Pittsburgh, with mail pick-up and delivery at 26 intermediate points. The other will run from Pittsburgh to Weston, W. Va., with 30 intermediate stops.

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## PHYSICS

## Audience Given a Deafness In Mass Demonstration

### Sounds Barely Perceived Against Noise Background Become Clearly Audible When Distraction is Removed

**S**CIENTISTS at the meeting of the Acoustical Society of America were made deaf en masse for a time and learned how one type of deafness appears to the afflicted.

Dr. Harvey Fletcher, acoustical expert of the Bell Telephone Laboratories, put on the show which every person with normal hearing ought to hear to learn the problems of those who live in a world of ringing bells, sirens, waterfalls and murmurs of voices.

While many deaf people hear no sounds, others have a kind of nerve deafness which produces sensations of noise in their head.

Day and night bells may ring, sirens may grind out their shrilling noises, the roar of waterfalls may be heard or even—in some cases—actual voices seem to be murmuring in a distracting background of sound.

To his audience, Dr. Fletcher brought such sounds by loud speakers in the auditorium and then, superimposed on this background of extraneous noise, he added simple speech, music and other understandable sounds.

Like the deaf people, members of the audience experienced great difficulty in hearing under this condition. Then suddenly, by removing the background of noise, Dr. Fletcher showed that the articulate speech which they had been trying to hear was really roaring at them as one might shout at a deaf person.

The ringing sounds in the heads of deaf people have been known to cause some eventually to commit suicide. While there has been no certain knowledge, it has been suggested that in some

cases the "voices" which famous characters of history have heard—like some of the saints and Martin Luther—may have been due to this type of deafness which produced head noises interpretable as ever-present voices. Luther's encounter with the Devil in which he hurled the inkpot at Satan may have had this physical interpretation.

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## AERONAUTICS

## Life Raft for Planes; Can Support 20 People

**A** NEW type of virtually unsinkable pneumatic life raft, designed to prevent repetition of forced landings by over-water planes as in the case of the British Cavalier several months ago with tragic consequences, is announced by U. S. Army Air Corps engineers at Wright Field. Larger than previous types, the new "rubber boat" will accommodate ten passengers and will provide sufficient buoyancy to support ten additional men clinging to lifelines attached to the boat.

A latex rubber bladder, canvas covered, supports the boat, the bottom of which is of heavy rubberized duck fabric, and contains three pneumatic inflatable seats. Valves and manifolds are provided on the latex bladder for inflation by carbon dioxide gas, and cylinders of this gas are attached. About five pounds of the gas are required for complete inflation.

The life raft is equipped with a pump and repair kit to patch leaks, so that the raft under ordinary circumstances will remain afloat almost indefinitely. Waterproof containers attached to the raft contain four army canteens of water, emergency rations, an emergency signal kit with six red flares, and a flare pistol. The raft may be rowed by four



TEN MEN IN A BOAT

*This official photograph of the U. S. Army Air Corps shows how their new collapsible rubber air raft carries ten men to safety. Earlier rafts of this sort could hold only two.*