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 themselves, 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

SCIENTISTS 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.

two-section metal oars which are strapped in place.

The new rubber boat is much more easily rowed and maneuvered than older and smaller boats, according to Wright Field engineers. When deflated and folded the craft occupies approximately three cubic feet of space.

The Air Corps plans to use it as standard equipment on its big four-engined bombers, when they fly overwater, but it will probably be made available soon to commercial airlines. Tests on the new boat have been completed, and an order has already been placed for a service test quantity, amount of which was not disclosed.

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Government engineers say that a small opening, such as the crack under a door, will almost completely destroy the sound insulating value of any wall.

Germany has ordered that universities and technical schools turn out engineers faster, by shortening the courses.

TIMES ARE CHANGING!

The gas mask has been improved in function but not in beauty or its grim reminder of the frailty of man. From left to right are shown: The handkerchief soaked in hypo that served the British against the German's chlorine. The Ku-Klux-looking outfit is a later development of the British in the World War. The feedbag-looking mask is of Italian make. On the facing page, at left, the new type U. S. Army mask with replaceable aviator goggles and ventilation to remove moisture. Next the new Navy mask with a diaphragm to permit speech. At right, a new mask of synthetic rubber-like material, Koroseal, transparent and with improved circulation of air to keep goggles free of fogging.

CHEMISTRY

Edgewood Arsenal Prepares For New Defense Program

Gas Masks Are Special Feature; Production Could be Speeded Up to 300,000 a Month With Present Plant

See Front Cover

A WITHERED skeleton of a mighty World War industry, which poured its products across the sea to the allies by the millions of units and then dried up when peace-time came, is coming to life again in a small Maryland town as Uncle Sam's new defense program swings into action on land and sea and in the air.

Gas masks for the Army! Smoke screens for the soldiers! Chemical shells and gas America hopes she will never use but is preparing anyway! That's the business of Edgewood's famous arsenal, busy as it has not been in many a year, a sprawling institution where experimental and pilot plants are being studied today to serve as guides for tremendous industries that may have to spring up overnight tomorrow.

You can see some of it today, if you have proper permission, and are in the custody of a watchful Chemical Warfare Service officer, but it is becoming a bit more mysterious than ever as a spreading air of secrecy masks its work.

Some buildings are relics of World War days. Everywhere, however, you will see huge concrete foundations that once supported enormous tanks of chemicals. Wherever you look are the network of pipes that once linked these tanks with buildings and buildings with each other. Through these pipes—ten feet off the ground—once flowed concoctions of death through poison gas. And they can do it again.

At Edgewood you learn that the term "poison gas" is little used in the service. Chemical agent is the characteristic term for everything from mustard gas to the sneezing and crying gases that go by the technical names of sternutators and lachrymators.

If the wind is right you will hear, at Edgewood, the dull booms of distant guns as chemical mortars, Livens projectors and their newer fellows shoot gas and smoke shells in nearby Bell Farm Test Field, hard by the shores of Chesapeake Bay. When the Army gets to work on its big guns at Aberdeen Proving Ground down the road toward Wilmington, you can really hear the big fellows roar.

The illustration on the front cover of this week's SCIENCE NEWS LETTER shows a smoke screen spread to cover movement of troops.

Any civilian visitor at Edgewood will