

They can hover while observations are made of enemy gun emplacements and tank movements, and while photographs are taken. They can dart away at a moment's notice when danger threatens.

Convertiplanes, such as the XV-1 just announced by the Air Force's Air Research and Development Command and the McDonnell Aircraft Corporation, are designed to bridge the gap between the conventional plane and the helicopter.

The helicopter can take off vertically, hover, squeeze in and out of tight quarters in rough areas and land in areas impossible for regular planes. Helicopters cannot carry a heavy payload economically. Their forward flight speed is low, their ceiling is limited and their controls are complex.

Fixed-wing planes have these advantages: high speed, high load-carrying capacity, high rate of climb, high operational ceiling, simple controls and fuel economy. Disadvantages are high-speed takeoffs and landings requiring long smooth runways, flat descent angle and poor slow-speed control.

The McDonnell design embodies a helicopter rotor on the XV-1's top, plus a pusher propeller behind its stubby wings. It is designed to carry three passengers, or two litter patients and a medical attendant, in addition to the pilot.

The XV-1 is the first military aircraft of its kind ever developed. Its helicopter rotor is powered by jets on the tips of the blades.

Although no flight tests have been made on the plane, performance tests on the ground are getting under way. The first XV-1 flight is scheduled for sometime this coming summer.

Other designs proposed in the past include such things as a regular type airplane propeller on the end of a helicopter rotor. The propeller swivels to pull the rotor around during takeoff. In the sky, the rotor is locked and the propeller on its end straightens out to pull the plane forward in fast flight.

Another design consists of two large helicopter rotors on the end of a fixed wing. The whole motor assemblies rotate 90 degrees to change the rotors from the "lifting" to "forward-flight" positions.

A third design was envisioned by an engineer who believed a plane could take off with its nose pointed straight into the sky, then pitch forward into normal flying position. Other engineers feared the craft's speed would be insufficient to permit the fixed wings to assume the plane's load when the time came.

Science News Letter, February 20, 1954

MEDICINE

Urge New TB Treatment

► A COMBINATION of a relatively new gout medicine, probenecid, and PAS, short for para-aminosalicylic acid, should be tried as treatment for tuberculosis, Drs. David T. Carr and Alfred G. Karlson of the Mayo Clinic, Rochester, Minn., advise.

They base their advice on the good results in tuberculous guinea pigs treated with the combination of these two recently developed drugs.

Probenecid, known also by its trade name of Benemid, has previously been suggested as a good team-mate for PAS already used in treatment of tuberculosis. Tests on a small number of patients showed it stepped up the concentration of PAS in the blood of the patients two to four times.

This finding was announced by Dr. William P. Boger of Sharp and Dohme, Benemid manufacturer, and Dr. Forrest W. Pitts of the Philadelphia General Hospital. (See SNL, June 23, 1951, and Aug. 12, 1950, p. 100).

Further studies by Drs. Carr and Karlson and E. V. Bridge at the Mayo Clinic showed that blood serum after PAS and probenecid had been given had greater ability to check tuberculosis germs in the test tube.

In spite of this, Drs. Carr and Karlson point out in their latest report, there have been no reports of studies on patients comparing the anti-TB effects of PAS alone and with probenecid. Since such studies would be difficult to make on patients, the Mayo Clinic doctors used guinea pigs to make their tests.

They injected 46 of these animals with tuberculosis germs. After 21 days, six were killed and found to have typical signs of TB. The other 40 were divided into four groups. One was left untreated for control. A second group got probenecid only. A third got PAS only. The fourth group got both drugs.

After 62 days the surviving animals were killed and examined, and the extent of the disease recorded on a chart for determining an index of infection. The untreated controls and the animals getting only probenecid had extensive tuberculosis. The ones getting PAS alone had active disease, but less than the first two groups. The ones getting PAS plus probenecid had, in contrast, "very little evidence of disease," the doctors state.

On the index of infection rating from one to 100, the untreated controls and probenecid-only groups rated about 65, the PAS-only group about 35, and the PAS plus probenecid group about 19.

In their report in *Proceedings of the Staff Meetings of the Mayo Clinic* (Jan. 13), Drs. Carr and Karlson state: "It is reasonable to predict that the concurrent administration of probenecid with PAS would enhance the therapeutic effect of PAS in tuberculosis or permit the use of a smaller dose of PAS without loss of efficacy. Unless PAS is completely replaced by other antituberculosis drugs a clinical study of this problem should be attempted."

Science News Letter, February 20, 1954

● RADIO

Saturday, Feb. 27, 1954, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Merrill Moore, psychiatrist and poet of Boston, Mass., will discuss "The Science of the Sonnet."

The National Science Foundation has made 100 grants totaling about \$1,045,000 for scientific research, conferences, education and information exchange this year.

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