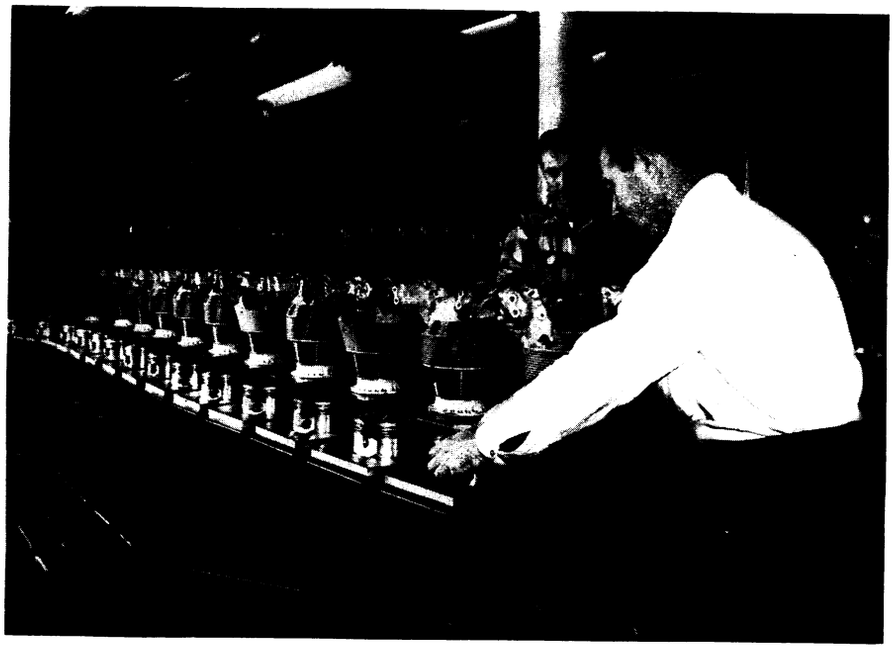

ASSEMBLY-LINE TURBO ENGINES—Factory conveyor line carries assembled cylinders and pistons to operators in order to speed-up installation on the engine at the restyled Curtiss-Wright plant, Wood-Ridge, N. J.

AERONAUTICS

Turboprop Versus Jet

➤ TOMORROW'S SUPERSONIC airliners may be powered by turboprop engines instead of jets.

More economical to operate, turboprop engines can be smaller in size than jets for a given power output. Airport noise also should be reduced, since the ordinary turboprop is quieter than its jet counterpart, reports Erle Martin, general manager of the Hamilton Standard division of United Aircraft Corp, Windsor Locks, Conn.

Turboprops even should be suitable for supersonic transport work. At Mach numbers between 0.7 and 1.2, the propeller-type engine would have a greater range than a jet of the same gross weight. Mach numbers express the speed of a body with reference to the speed of sound in the surrounding atmosphere. Mach 1 represents the speed of sound.

Length of runway, becoming ever more critical in jet plane operations, will not be a major worry to operators of turboprop craft, since the propeller-powered plane will be able to take off in half the space of its jet counterpart.

Because a full reverse thrust can be applied to the propeller to slow the plane down, landing also will be simplified. The airliner should roll to a stop in 40% of the distance it would take if brakes alone were used.

The turboprop engine essentially is a gas turbine that is connected by gears to a propeller shaft.

However, Roy T. Hurley, president of the Curtiss-Wright Corporation, believes that the turbo-compound engine that his company makes also stands a good chance of outrunning the jet on an economy basis. But this assumes that the planes will fly below the speed of sound.

Mr. Hurley said he thought the airlines would operate at subsonic speeds for some time. At near sonic speeds, the ride would get so bumpy as to be distasteful to many air travelers, he predicted.

Curtiss-Wright is striving to make its turbo-compound engine even more attractive to operators of air fleets. By restyling its Wood-Ridge, N. J., plant to use the assembly line technique, costs of building the engines have been cut in half.

Automatic machines have been installed to speed up work. One machine, operated by two persons, now does a job formerly requiring a crew of 10.

The turbo-compound engine is a piston-type engine. Its exhaust, however, spins small turbines geared to the engine's crank shaft. The turbines extract power remaining in the exhaust gases and feed it back into the engine to help turn the propeller.

Curtiss-Wright's engine has 18 cylinders exhausting through three small turbines. By capturing some of the energy still in the exhaust gases, the turbines increase the power of the engine 20%.

Science News Letter, January 30, 1954

Bats are the only *mammals* that possess the power of true flight; other so-called "flying" animals, such as squirrels, merely glide.

SURGERY

Quick-Frozen Lungs May Be Next Spare Part Job

➤ QUICK-FROZEN LUNGS may become the next spare parts surgeons dare to graft. How long they will survive after transplantation is a problem now under consideration by Drs. Creighton A. Hardin and C. Frederick Kittle of the University of Kansas Medical Center, Kansas City.

They have already succeeded in transplanting one entire lung from one dog to another, with survival up to 30 days when the donor and recipient were litter mates.

Not only did dogs survive the operation for varying periods, but the lungs continued to function as breathing organs. Proof of this came from two animals who survived for two and nine days, respectively, when they had only the transplanted lung to breathe with. The right lung of each was removed after the left lung had been replaced by the transplanted lung.

The operative technique for lung transplantation is feasible, but the key problem still to be overcome is that of reaction to the foreign protein substance in the body, the University of Kansas surgeons point out in *Science* (Jan. 15).

Benadryl and X-ray treatments have not helped on this. Cortisone helped the dogs with grafted lungs survive a little longer. Removal of the spleen, with the idea of removing the source of antibodies to the foreign protein substance, did not affect survival.

Further studies on this aspect of the problem, including the survival of quick-frozen lung grafts, are in progress.

Science News Letter, January 30, 1954

ENGINEERING

Return to Electricity Foreseen for Railroad

➤ ELECTRIC RAILROADS may return to a prominent spot in some parts of the country despite the present trend toward diesel engines.

H. F. Brown and R. L. Kimball of Gibbs & Hill, an architectural firm, told the American Institute of Electrical Engineers meeting in New York that lower operating costs may put more of the big electric motors on the rails in the future.

Specifically, they cited lower maintenance costs, terminal costs, power costs and fixed charges as the economic factors of an electric system that can compete with a diesel installation.

"It is believed that when the differences in all these costs are fully determined, electrification will again be applied to certain parts of the American railroads," they said.

F. D. Brown, Westinghouse Electric Corporation engineer, pointed out that the costs of diesel and modern electrification are so close that an adverse change in the cost and supply of oil might start a trend back to electricity.

Science News Letter, January 30, 1954