AERONAUTICS

Speedier Planes Foreseen

Jets and rockets have revolutionized flying since the Wright brothers' first hop 45 years ago. More speed and greater safety are forecast for the future.

By A. C. MONAHAN

➤ PARIS in an hour? Week-end trips to the moon? Routine travel faster than sound? Anywhere on the earth just across the airstrip?

Now aviation is two-score and five years old. Now the Wright brother's biplane, famous for its world's first 852-foot hop at Kitty Hawk, N. C., on Dec. 17, 1903, is back home in the Smithsonian Institution as one of the great national relics. Now jets and rockets streak the air with supersonic speed. Giant 100-passenger transports cruise above oceans and continents.

What's ahead? What will the intensive research of a hundred laboratories hatch for the air future? Here's what the experts dare to expect.

Planes of tomorrow may bear little resemblance to those of today. New power plants, new sleek design lines to meet the requirements of supersonic speed, and new air knowledge, may make them obsolete long before the end of the second 45-year period. What future airplanes will look like is only a matter of speculation.

Designed for Speed

Future planes designed for fast speed will perhaps be long and narrow, with lance-like noses to penetrate the air and bodies tapering to the rear, and with short but broad square-tipped wings whose forward edges will be sharp like knife blades. But, on the other hand, they may follow the design of the flying wing, a type of ship in which the entire surface contributes to lift, and drag is at a minimum.

What 1993 air travel will be is only a guess, but what the next few years will bring is more certain. Bigger planes may be built, but that is not particularly important. Economics, not mechanics, will probably be the determining factor. Greater speed seems to be a popular demand. Faster planes of the present types are certain as jet-propulsion replaces the conventional whirling blade propellers driven by ordinary engines.

In the relatively near future, transcontinental and transoceanic scheduled transports may have speeds approaching that of sound, approximately 760 miles at sea level. Improved jet engines will be responsible. It must be remembered that jet-propulsion is still in its infancy. It is only six years since the first American-built jet plane made a successful flight. England had beaten us by over a year in this development, Germany perhaps even more. The engine in America's first jet plane was the British-developed type. Now America has several advanced jet engines of its own, and new types in the making.

Rocket ships have been proclaimed in popular literature as a possible conqueror of interplanetary space. Rockets are already playing an important part in aviation, but too much must not be expected of them in ordinary transportation. The duration of rocket-powered flight will always be short if the vehicle is subject to return to the earth through its gravitational influence, an aviation expert recently stated. This is due to the weight of the oxygen that must be carried in addition to the weight of the fuel.

The range of rocket-powered flight, he added, is theoretically very great in certain types. After leaving the earth's heavy blanket of atmosphere, the velocity of the rocket may be stepped to over ten times the values practicable in the lower atmosphere.

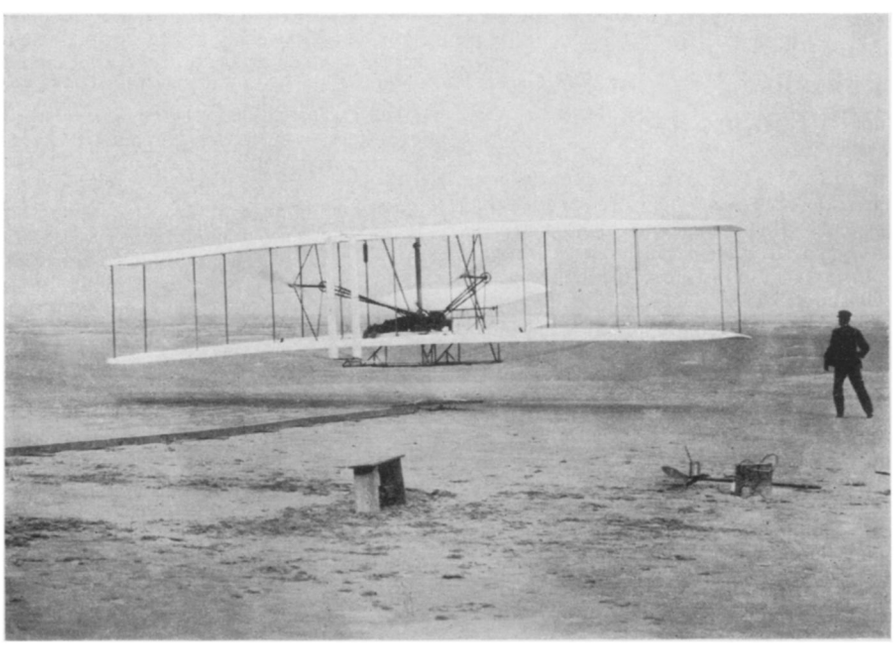
Present uses of rockets in aviation are principally as take-off assists to help get heavily loaded planes into the air, and as supplementary power to give spurts to planes in the air in emergencies such as might be encountered by a fighter in combat. Some day, they may be applied to craft designed to travel at very high altitudes to take them swiftly along the part of the course too high for other engines to operate.

Rocket engines are the only types now known which can be used where there is too little air to provide oxygen for combustion, a requirement in all other present engines. Rockets carry their own oxygen, usually in an oxygen-yielding chemical mixed in the fuel. Liquid oxygen is also used, particularly with liquid fuels.

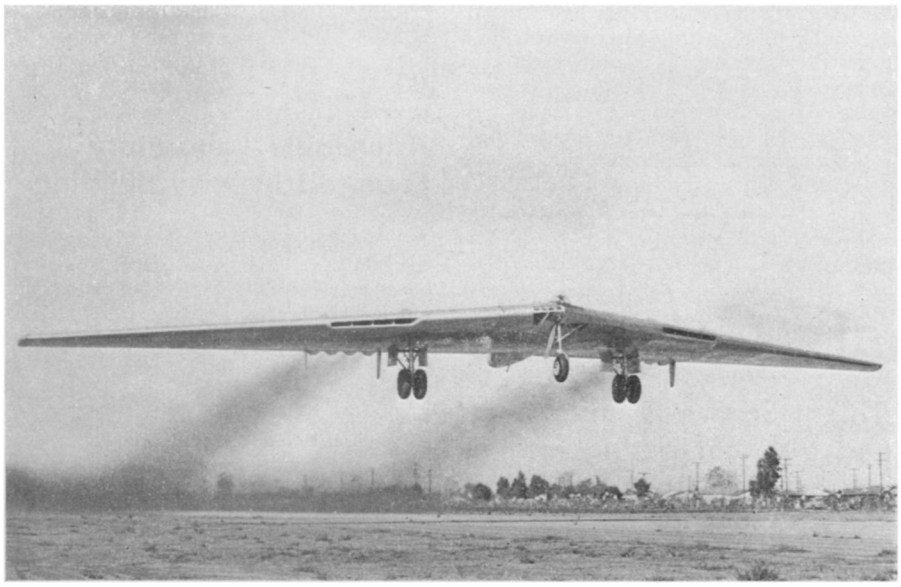
Atom-Powered Planes

Atomic power is a possibility for airplane propulsion in the future. Some engineers seem to think that it would be a comparatively simple matter to utilize the heat generated by the fission of atoms in the combustion chamber of a gas turbine. First, however, man will have to learn how to apply atomic energy to stationary equipment, and how to take care of the radio-activity and poisonous byproducts that are developed.

The ram-jet engine is also for auxiliary power, or for total power after a plane has reached a high speed. It can not be used as a take-off assist because it operates only after it has acquired sufficient speed



AVIATION'S HUMBLE ORIGIN—This is the original Wright plane which is famous for its world's first 852-foot hop at Kitty Hawk, N. C.



45 YEARS OF PROGRESS—This U. S. Air Force Northrop Flying Wing eight-engined, jet propelled bomber is one of the achievements of modern technology.

to be able to scoop up enough air for combustion. It is useless above the atmosphere because it depends upon air for its oxygen. But where it can be used, it is one of the most efficient power plants yet developed.

Ram-jet engines are of very simple construction. They are metal tubes open at both ends which scoop up sufficient air at speeds of some 300 miles per hour to unite with fuel in a combustion chamber. The gases of combustion are discharged at high pressure to the rear to cause propulsion. Its outstanding features are its high power per unit frontal area, and per unit weight, its high specific impulse as compared to rockets, and its mechanical simplicity.

Pilotless airplanes, controlled by radio, have already successfully flown many thousands of miles in company with control planes, separated by miles, from which the controls were handled. They take off and land under remote control. It will be remembered that pilotless planes, carrying photographic equipment, flew through the air over the atomic bomb tests at Bikini. Their mothership flew safely to one side of the explosion area. Guided missiles, widely mentioned, are controlled in about the same way, using usually ground-based radio-radar stations.

Pilotless planes are not likely to be used in the near future to carry civilian passengers. They might some day be used for mail and express. A plane equipped with jet engines for take-off and landing, with rocket or ram-jet power in flight, might cross the Atlantic in a few hours. Control stations would be located on land or on anchored vessels or floating rafts between Newfoundland and Ireland.

Speed with Safety

Supersonic speeds without safety would have little value in commercial air transportation. But static-free very high frequency radio communication between aircraft and ground stations is already in use and vastly improved equipment is promised. Radio ranges, whose beams pilots follow, are also using very high frequency waves. They are an important safety factor, enabling a pilot to fly even under bad weather conditions.

Important also are the improved instrument landing equipments which enable a pilot to bring his ship safely to the airfield even when the runway can not be seen until down to within a hundred feet of it. Radar, radio, and approach and runway lights which can be seen a thousand feet through dense fog, all play important parts. The ground-controlled approach system, developed during the war to bring military craft safely in by means of radar and radio, has assisted many thousands of planes to runways. It is but about five

years old. Already greatly improved, it is a system from which much may be expected in the future.

Within the next decade or so, greatly increased speeds in civilian transportation by air may be expected. Turbo-jet, ram-jet and rocket engines will be responsible. The so-called unbreakable sonic barrier, related to the elasticity of air which limits the speed of sound, has already been broken. New designs to permit fast traveling and to withstand the air shock waves encountered may alter the general appearances of supersonic planes. And along with these developments the "everyman's" helicopter may be simplified and become a familiar sight in millions of backyards.

Science News Letter, December 11, 1948

GENERAL SCIENCE

Young Scientists Compete

Eighth Annual Science Talent Search is under way this month with 16,000 boys and girls competing for the $11,000 in Westinghouse Science Scholarships.

➤ 'TEEN-AGE scientists all over the United States are sitting down for some pre-Christmas writing.

Their three-hour composition will be no letter to Santa Claus but it will bring 40 of them the best Christmas present they ever had—an invitation to the five-day Science Talent Institute in Washington and a chance to win a Westinghouse Science Scholarship.

Some 16,000 boys and girls began to take, on Dec. 1, a three-hour science aptitude examination in their own public, private and parochial schools as the first step in the competition for the $11,000 in Westinghouse Science Scholarships offered in the Eighth Annual Science Talent Search, conducted by Science Clubs of America, administered by Science Service.

The high school seniors, all of whom aspire to careers in science, will also submit scholastic and other recommendations and a 1,000-word essay on the subject, "My Scientific Project" before the competition closes at midnight, Dec. 27.

Judges to Name 40 Winners

The science aptitude examination, designed each year by Drs. Harold A. Edgerton and Steuart H. Britt, New York psychologists, is planned to reveal ability to think and reason rather than to measure acquired knowledge of science.

Only 40 boys and girls will be invited to the Eighth Annual Science Talent Institute March 3 through 7, 1949. For five days they will learn about new developments in science, listen to and talk with prominent scientists and be introduced to possibilities for their future in scientific research.

During their five-day all-expense stay in Washington one of the young scientists will receive the $2,800 Westinghouse Grand Science Scholarship. Runners-up will receive scholarships ranging from $100 to $2,000. The $11,000 in scholarships will be awarded at the discretion of the judges: Drs. Edgerton and Britt; Dr. Harlow Shapley, director, Harvard College Observatory; and Dr. Rex E. Buxton, Washington psychiatrist.

Honorable Mention For 260

The judges will name 260 other entrants in the Science Talent Search for Honorable Mention and Science Clubs of America will assist them as well as the 40 winners in getting scholarships at the colleges, universities and technical schools of their choice. Previous Honorable Mentions have received valuable scholarships and other financial assistance in this way to continue their education.

Entry materials and full details of the Eighth Annual Science Talent Search can be obtained by writing to Science Service or direct to Science Clubs of America, 1719 N St., N. W., Washington 6, D .C.

Science News Letter, December 11, 1948

GENERAL SCIENCE

Adjustable Laboratory Featured in New Building

➤ LABORATORY SPACE tailored to fit the needs of individual experiments can be arranged in the $8,000,000 first section of General Electric's new research laboratories near Schenectady, N. Y., which has just been dedicated.

Standardized steel partitions in the building can be set up or taken down in a few hours to create different room sizes. Pipes and conduits in the laboratory will supply the researchers with direct and alternating electrical current of various voltages, city water, distilled water, illuminating gas, oxygen, hydrogen, nitrogen, compressed air, vacuum and steam.

Science News Letter, December 11, 1948

CHEMISTRY

New Synthetic Detergents Have Advantages Over Soap

➤ ONE POUND of synthetic detergents is now sold for every five pounds of soap, and these newer cleansing agents boast several advantages, the American Oil Chemists' Society meeting was told in New York.

Foster Dee Snell of Foster Dee Snell, Inc., said that the synthetics usually work better in hard water than in soft. On the other hand, more than half of the soap used in your household probably goes to soften the water so that the rest of the soap can do its work. Development of synthetic detergents also may help the world food situation, he added. Soaps are made from fats and oils, while many of the detergents are made from petroleum.

Science News Letter, December 11, 1948

Hydrazine hydrate is an important ingredient in some rocket fuels.