tions may be to follow this precedent, it is unrealistic to expect them to achieve the necessarily high standards let alone have the resources in personnel and materials, for a long time. Meanwhile, the generations of a trypanosome are measured in hours, not years; epidemic diseases are no more respecters of time than of international frontiers. If the return of possibly disastrous epidemics is to be avoided, the solution must lie in the action of a body, such the World Health Organization, with the vision and status to put forward a realistic program of eradication on international lines. The aim is not too high; the benefits would be immeasurable.

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Science in the News

The Atomic Airplane: "This Program Has Had a Very Irregular History"

The project to build an atomic airplane is now 14 years old, and in the unarguable words of a House appropriations subcommittee, it has had a very irregular history. To date over a billion dollars have been spent. The Defense Department estimates it will take at least another billion and another 5 years before a plane is actually in the air. The project has understandably become the most controversial in the Defense Department. It has been attacked from one side for not making an all-out effort to get some sort of atom-powered airplane aloft as soon as possible, from a second for trying to build a plane prematurely, and from a third for spending too much money on a project whose achievements, now that the first billion has been spent, are not very impressive and whose long-run value is difficult to define.

The first group of critics draw their strength mainly from the support of Congressman Melvin Price and several other members of the Joint Committee on Atomic Energy. These critics would like to see a plane in the air, any plane. They are willing to settle for what is called a "flying platform"—that is, a machine that may have no function beyond demonstrating that it can get off the ground.

At the moment the flying platform advocates are unhappy. Last summer, in the most recent of the program's many reorientations, the Defense Department decided to do its preliminary testing on the ground. The program is now concentrating on research, and letting the flying platform have only token support. The intent is to put a plane in the air only after an engine has been developed that will keep the plane aloft for a very long time, although probably not at supersonic speeds.

This approach seems to command broad support, not only in the Defense Department, but in the AEC and among the scientific advisory committees that have studied the project. But it is the source of strong feelings among the flying platform advocates. Here are excerpts from an impromptu lecture Congressman Daniel Flood delivered at a House appropriations committee hearing. The witness was Admiral Burke, the chief of naval operations, who has very little to do with the atomic airplanes. But Congressman Flood was sufficiently irritated about the way things were going to make a speech on the subject nevertheless.

"When Secretary Wilson [Eisenhower's first Secretary of Defense] was here a few years ago," said Flood, "I tried to ask him to explore the moon with me or hit it with tin cans, or a slingshot, or something, but hit it quick. He laughed at me and said he was not interested in finding out whether the moon was made out of green cheese. This was about a year before the Russians shot Sputnik. . . . I am having the same attitude with the Department of Defense and everybody down there about a nuclear-powered aircraft. I do not care how big it is, and I do not care how much it costs. I want the Department of Defense to propel an airframe with nuclear power 50 feet off the ground, 20 miles an hour, if need be. But move it. . . . Wilson, wherever he is, may laugh at this and say it does not mean a thing. That is a matter of opinion. This is a horse race. I would like to see the United States propel aircraft by nuclear power first. . . . If you think it has the tremendous psychological advantage or potential impact that I think it has—on a lot of people all over the world—why do you not try harder for it? Why do you not twist somebody's arm?"

Admiral Burke: "Because it costs too much."

Mr. Flood: ". . . That is the end of the argument, not with me but with you people who have the other problems. . . . This statement of mine . . . is treason according to the new line in Washington . . . because the budget is placed before what I think should come first, among other things, including a nuclear powered aircraft."

But Flood's feelings were not shared by many of his fellow members of the appropriations committee, and particularly not by Chairman Clarence Cannon. Most accepted the Defense Department's assurance that the best scientific estimates strongly suggest that a crash program merely to get a plane in the air would be a misuse of money and scientific talent that might be spent better on other research and development projects, including the advanced reactor and engine research at which the program is currently aimed. But a

very sizable minority of the appropriations committee questioned the wisdom of spending so much money on aircraft nuclear propulsion on the grounds that it now seemed to be mainly just research, and that a useful plane was still years away and partly just an incidental by-product of the basic research being done on reactor technology and materials, and above all, of doubtful utility. Because of the heavy shielding it must carry, the atomic plane will probably be inferior to conventional planes in all respects except its ability to stay aloft for perhaps 1000 hours or more. It is a matter of dispute as to how useful it would be to have a plane that could stay aloft 1000 hours.

The project's appropriations are split almost evenly between the AEC and the Defense Department. An appropriations subcommittee, disturbed by the amount of money the program was costing and the lack of easily definable long-range benefits or short-range progress, voted to cut out all of the $73 million recommended for the AEC share. This would have cut the program in half. But the full committee restored most of the money; the vote was 19 to 18. The Senate restored the rest of the money, and last week the House accepted the full figure.

During the hearings last May the House committee did get a commitment from the Defense Department to make some decisions within four months or so and to try to decide which of the alternative approaches now being supported, the indirect or the direct cycle engine, might be eliminated. The four months are now up, but it appears that the principal decision is going to be that it is still too early to decide. Meanwhile the appropriations committee has put a team of investigators to work to try to find out if the taxpayers are getting their money's worth.

The direct cycle uses the heat developed in the reactor to power the engine. The indirect cycle transfers the heat to an intermediary fluid, perhaps liquid sodium, which in turn carries the energy to the engine. The tendency has been to move away from the direct cycle concept being worked on by General Electric, and toward the indirect cycle concept being worked on by Pratt and Whitney.

But even if a decision is made to terminate the G.E. work as part of the atomic-aircraft program, it appears likely that much of it will continue as part of another related program, Project Pluto, an atomic-powered ramjet missile. The Pluto does not require much concern with either of the two great barriers to a nuclear airplane: the need for a high-intensity reactor that will not burn out in a short time and the need for heavy shielding to protect crew and cargo, which makes the plane difficult to fly. The missile, of course, will have no passengers, and heavy shielding is not needed. Traveling at several thousand miles an hour, it will not need a long-lived engine to push it on its one-way trip to a target. So Pluto will probably be the first object to fly under atomic power, perhaps in 1964. The airplane, it is hoped, will follow a year or so later, as may a third project, Rover, the atomic rocket.

In sum, the flying platform advocates are, temporarily at least, losing their battle, and the Congressmen who have doubts about the wisdom of spending such huge amounts of money on the project if it is being directed mostly at basic research and developing the state of the art, rather than at a specific Defense need, are also a little unhappy. But critics, many of them scientists, who have attacked the program as a misguided attempt to try to do first (build an atomic plane) what can only efficiently be done after the state of the art is more advanced are those who seem to be most successful. They have the support of Herbert York, the chief of research and development at the Pentagon, and York has the confidence of the most influential people on Capitol Hill. The current orientation reflects their viewpoint.—H.M.

News Notes

Molotov Named Representative to Atomic Agency as General Conference Opens

Vyacheslav M. Molotov, former Premier and Foreign Minister of the U.S.S.R., has been recalled from his assignment as ambassador to Outer Mongolia to serve as Soviet representative to the International Atomic Energy Agency in Vienna. It has been suggested that he was withdrawn from his Outer Mongolian post, considered a diplomatic Siberia, because as Stalin's closest associate for 30 years he is too much in sympathy with the Chinese Communists, so close to Mongolia.

The 70-nation IAEA is supposed to be nonpolitical and to serve simply as the clearinghouse for information and technical assistance in the peaceful use of atomic energy; nevertheless, frequently the pattern of debate follows that of current international politics. Molotov may be out of favor with Premier Nikita Khrushchev's regime, but he is still one of the Soviet Union's most experienced and effective diplomats. He is already in Vienna preparing his participation in the fourth session of the IAEA's general conference, which opens on 20 September.

Critical Issues To Be Discussed

During the 2-week meeting, several problems of critical importance to the agency's future will be discussed.

One of the issues is that of inspection to see that nuclear fuel provided by the agency is not used for military purposes. Some nations consider an inspection system an invasion of sovereignty, a view that has been supported by the Soviet Union.

The meeting chairmanship is also an issue, even though the chairman serves only for the duration of the session. Last year Georgi Nadjakov of Bulgaria was expected to be elected, but the United States objected to the post's being held by a Soviet-bloc representative and Hiroo Furuuchi of Japan was named instead—an event which led to charges that the agency was dominated by the United States. Nadjakov is again a candidate.

Another controversy, of major importance but the least clearly defined of all, is associated with the agency's role in helping emerging nations. When the agency was founded in 1953, these countries could not obtain fissionable material for peaceful purposes, and one of the new organization's principal functions was to act as a broker for such substances. Now it is relatively easy to procure them directly, without assistance.

A further problem connected with the IAEA's role arises from the growing conviction that atomic power is impractical for many underdeveloped nations, a complete reversal from the hopeful view of 1953. Yet the possession of a reactor has become a matter of national prestige, and this seems to be stimulating both the United States and the Soviet Union to provide technical aid that could be considered more politically than scientifically motivated. When IAEA specialists try to discourage a nation from launching a nuclear program, they are sometimes accused of protecting the monopoly of the major powers.