

Such statements as these only serve to strengthen our determination in the West to keep pace, otherwise we will surely lose the race.

In considering what is a practical rate of advance from the scientific point of view, there would seem to be 3 basic factors, without any one of which further progress would eventually be slowed almost to a halt. I am going to talk about these factors for they are, I think, particularly relevant to the aircraft industry at the dawn of the Atomic Space Age.

They are - the growth of new knowledge, the availability of new sources of power, and the development of new materials.

First, the growth of new knowledge.

It is self-evident that the discovery of new knowledge, of new facts hitherto unknown, or of new natural laws must, in the main, stem from basic or fundamental research, carried out largely at universities or at government research laboratories. The scientist is not concerned with the profit motive. He carries out his researches and his experiments purely in the hope of adding something new to man's store of knowledge of the world about him and of the natural laws which apply to it. Frequently the true scientist does not even know where his work is leading him; often he does not even care, so long as he is adding to knowledge of his subject. But he persists, and from time to time he achieves a "breakthrough" which he thereupon hands over to any one who wants to use it. His discoveries and achievements provide the raw material for the engineer. His end point is the engineer's starting point.

The engineer, on the other hand, must be concerned with the profit motive. It is up to him to take the raw material of the scientist and put it to practical use, in a form, and at a price, that makes it both attractive and useful to a customer. This is true whether the product is one which can be sold to the public-at-large by the million, or whether it is extremely costly, such as a complex weapons system, with but a single customer - the government. My point is that the engineer and the scientist must work together as a team. If the rate of advance I mentioned a few moments ago is to continue, they must communicate continuously with one another for, in fact, they are mutually dependent.

The second factor essential to rapid advance lies in the need to make available new sources of power, again a problem for scientists to discover and for engineers to put to use.