

is meant to accomplish. To be sure, it is a fair prediction that in due course, some decades from now, people will have practical need to transport each other from the surface of the Earth to some orbiting apparatus and back again. In exactly the same spirit, it would have been possible to predict when the Wright brothers first flew that it would in due course be necessary to develop methods for constructing pressurized cabins capable of containing passengers safely at altitudes above 30,000 ft. The trouble then, which any small businessman would have pointed out, is that the time between successful development and practical application would have been uneconomically long. In business terms, such a strategy would have been a recipe for making a loss. To technologists, what it would imply is the squandering of valuable skill and resources. Nothing that NASA has said about the shuttle and its usefulness in the past year suggests to reasonable people that there is an application around the corner for such an expensive instrument. Rather, the agency seems to be following the old but now discredited precept that in technology, the wish can become the father of the thought, or at least that the availability of a new machine will somehow engender a demand for it. Outside the fields within which government

budgets operate, the road to Carey Street is strewn with opinions like these.

The appointment in the last few weeks of Dr James C. Fletcher as administrator of NASA should help to resolve some of the questions hanging over the space agency. The fact that Dr Fletcher has taken the job at all presumably implies that he has been given some assurance that the Administration is prepared to take the agency seriously at least for the next few years. Especially because the US Air Force is involved, the future of the shuttle as such is probably assured. But even within the framework now laid down, there is plenty of room for making better use of NASA's skill and experience. To begin with, all kinds of applications of space research are waiting to be carried out (which does not imply that even in this potentially valuable field, NASA should seek to run before it can walk). There is also plenty of room for some of the basic research on different types of rocket motors which may, ten years from now, provide the foundations for new rocket technology. More humdrum still, there is room for application of some of the advanced development in aeronautics from which new types of advanced aircraft are likely to emerge.

100 Years Ago



SCIENCE IN GOVERNMENT WORKSHOPS

THERE seems to be a singular antagonism between science and officialism. The Government has undertaken more than one special manufacture, and not without a certain measure of success, but even the best of Government factories are tainted with some perverse defiance of scientific principles. Why this should be is too large a question for present discussion, but the fact is beyond doubt. Take, for example, one of the most effective seats of national manufacture—the small-arm factory at Enfield, which is under the command of an officer who may fairly be credited with scientific intelligence. You will see there a considerable amount of what may be called imported science. Outside inventions in machinery, in rifle barrels, in locks, in breech-actions, and other branches of the work, have been appreciated, adopted, and improved, and this is so far good. The Snider is a very clever makeshift, and perhaps as good a converted rifle as could have been made out of the old Enfield. The projected Henry-Martini, again, has an excellent breech-action, though not quite the best that might have been selected. Its barrel is on a good and tried pattern, although one that has not very successfully competed with the Metford. In these respects, the design cannot be called unscientific, but it is said that one essential element of the new rifle—the sighting—if not absolutely left to be fixed by tradition and routine, will be in principle little better than the worthless sighting of the old Enfield. If a crack shot were offered the choice between a first-rate barrel with clumsy and unscientific sights and an inferior barrel fitted with perfect sights, he would certainly prefer to enter into a competition with the latter weapon.

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What Price Oil ?

THE long haggle between a consortium of Western oil companies and a consortium of potential suppliers, principally Libya but including Saudi-Arabia and the Atlas states as well, raises important issues for fuel policy planners throughout the world. In the long run, the implications for science and technology may also be considerable. To begin with, what the Libyans ask for is what any supplier of raw materials would sensibly demand—a higher price for a commodity which even in the lush oil fields of North Africa is certain, one of these decades, to be exhausted. The trouble is that it will be possible to sell oil at a higher price only if this is done on a much smaller scale, for there are already signs that the price of oil is too high to make the commodity competitive. In Britain, for example, the days are gone when electricity generating stations might have been fuelled by imported oil, and there has even been a brief resurgence of the traditional atavistic fondness for coal which singled Britain out as such an odd place in the years immediately after the Second World War. In practice, in Britain, one result has been to stimulate the search for indigenous oil. Another has been to confirm the view that in the long run nuclear power is likely to be the anchor of the fuel economy. Much the same has happened in France, where only two weeks ago *Electricité de France* said that it would buy ten nuclear power stations in the next five years. It is inevitable that the haggle about oil prices will accelerate the tendency throughout the industrialized west to manufacture electricity from uranium. To say this does not of course imply that the bargain which the Libyans are seeking to drive will in the long run be to their disadvantage. But they will have to be more deft than they have been so far if they are to maximize their profits without pricing themselves out of the long term market.