

Noted and discussed an oral briefing by the Director of Central Intelligence on the subject, with specific reference to recent Soviet ballistic missiles activity; and the situations in Indonesia and the Near East.

3. U. S. OBJECTIVES IN SPACE EXPLORATION AND SCIENCE
(NSC Action No. 1859)

General Cutler introduced Dr. Killian, who stated initially that the reports to be given by himself, Dr. Purcell and Dr. York were in the nature of informal reports and would not contain specific recommendations. Next, Dr. Killian undertook to explain the main motives behind the development of space technology and space exploration. These he listed as, first, natural human curiosity about the nature of the universe; secondly, military considerations; third, U. S. prestige vis-a-vis the Soviet Union and other countries; and fourth, scientific observation and experiment. Space travel, thought Dr. Killian, may or may not have material and practical values, but the space programs that would be discussed at this time must, all of them, be based on the above-mentioned four motivating factors.

Dr. Killian then indicated that various programs of differing size, shape and cost would be presented to the Council in order to provide the basis for a subsequent choice of a U. S. national outer space program. Dr. Killian, in this context, pointed out the need for a balanced outer space program--one which would take into due account the other great national security programs, inasmuch as any effective outer space program was bound to prove very costly.

Thereafter Dr. Killian called on Dr. Purcell, who discussed with the Council his views on space science and the objectives of space science. At the end of his discussion, these objectives were summarized on a chart which was divided into three time-periods: Early (first years), Later (two to five years), and Still Later (five to fifteen years). Dr. Purcell concluded his remarks with comments on the military application of space exploration. He listed on a chart (1) communications; (2) reconnaissance (optical, radio, infrared); (3) early warning; (4) meteorological.

At the conclusion of Dr. Purcell's remarks, the President inquired whether Dr. Purcell thought it would be a good idea if there could be more public education with respect to the matters in his report. The general view seemed to be in the affirmative.

The President then inquired of Dr. Purcell whether the distant planets of which he had spoken rotated on their own axis as did our earth. Dr. Purcell replied that most of them did, but that there were some we could hardly see and could not determine whether they rotated or not.

Dr. Killian next introduced Dr. York, who, he indicated, would discuss various illustrative space science programs designed to achieve the objectives of space science which had just been outlined by Dr. Purcell.

Dr. York spoke first, using a chart, of the vehicles which would be used in the exploration of outer space. The first usable vehicles would be the IRGMs--JUPITER and THOR--with added stages. Such vehicles would be available late in 1958 or early in 1959. They would eventually be able to carry a pay-load (instrumentation, etc.) weighing 500 pounds.

Later on in the process, Dr. York indicated that ICBM vehicles would become available for space exploration. Either TITAN or ATLAS could be used, perhaps in 1961, with a third stage added to them. The pay-load carried by these vehicles would be much larger than that which the IRGMs could carry. The pay-load for an earth satellite could be as large as 6500 pounds if fluorine were used for fueling, or 3800 pounds if the ICBM were fueled with liquid oxygen (lox). For a moon-hit or a Mars-hit, a pay-load of 2150 pounds with fluorine and 1000 pounds with lox could be carried.

Dr. York cautioned that even an ICBM vehicle was not sufficiently powerful to get a man to the moon. To do this we would have to construct a very large new rocket with a weight of 1.5 million pounds gross. He estimated the cost of developing such a new rocket as lying somewhere between \$500 million and \$1 billion.

After describing the various sample or illustrative space science and exploration programs, Dr. York turned to the subject of the approximate costs of such programs. The cost of any effective space exploration program would begin at \$275 million a year, and would be likely to reach a cost of \$650 million a year by 1965. Such figures, moreover, said Dr. York, were minimal.

Dr. York pointed out that a probing of the planet Mars, which might be achieved by the United States in 1962, would probably be the first achievement we could count on doing before the Russians, because they were so far ahead of us in big boosters.

The final section of Dr. York's report dealt with the possible effects to be achieved by exploiting very large megaton bombs at various heights above the earth's atmosphere. If sufficiently powerful, such explorations, he believed, could inhibit all space travel, including intercontinental ballistic missiles.

In bringing the report to a close, Dr. Killian, followed by Secretary Quarles, stressed the security aspects of the information which had been provided for the Council, most particularly with respect to the final portion of Dr. York's presentation. Dr. Killian

also indicated that time would not permit him to go on with a discussion of the organizational aspects of a U. S. program for space science and exploration. This subject would be discussed by Dr. Killian at a subsequent Council meeting.

The National Security Council:

- a. Noted and discussed a report by the Special Assistant to the President for Science and Technology, assisted by Drs. Edward Purcell and Herbert York of the President's Science Advisory Committee, prepared pursuant to NSC Action No. 1859-b, on U. S. objectives in space exploration and science, and examples of possible programs designed to achieve these objectives.
- b. Noted that the Special Assistant to the President for Science and Technology would make a subsequent report to the Council on the organizational aspects involved in pursuing U. S. objectives in space exploration and science.

NOTE: The action in b above, as approved by the President, subsequently transmitted to the Special Assistant to the President for Science and Technology.

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