

NATIONAL ACADEMY OF SCIENCES  
NATIONAL RESEARCH COUNCIL  
OF THE UNITED STATES OF AMERICA

SPACE SCIENCE BOARD

November 10, 1971

MEMORANDUM

TO: Members, Committee on Space Medicine

FROM: Ann Wagoner, Staff Officer

SUBJECT: Prospectus on Long-Range Problem Areas Relative to Man in Space

You will recall that at the Committee's last meeting members agreed to provide the Chairman with their thoughts on what problem areas relative to man's participation in spaceflight should be given particular attention during the next decade or so. The purpose of this exercise is twofold: to bring into focus the research that must be done in preparation for extended manned spaceflight, and to identify the principal issues to which the Committee should address itself in the future.

As one way of approaching this task, we have prepared a list of questions (see attached) which you may wish to answer in relation to your particular interests and expertise. Alternatively, you may find another format more convenient. Since the investigations to be carried out will undoubtedly be affected by actual conditions in the space program, the questions are preceded by a brief summary of some salient factors about budgets and programs. We emphasize that the guesses about the future that are included in this framework are guesses.

Dr. Kass urges you to send him your contributions as soon as is conveniently possible so that they may be compiled into a paper for distribution in advance of your January meeting. For convenience, would you please send copies to him and to me? His address is: Dr. Edward H. Kass, Director, Channing Laboratory, Harvard Medical Unit, Boston City Hospital, Boston, Massachusetts 02118. If I can be of use, as in obtaining publications or background materials for you, please let me know.

Also enclosed is a summary of Dr. Berry's privileged report to the Committee at its last meeting on medical aspects of the Apollo 15 mission.

Enclosures



### Framework

The manned program, which is pretty well locked in through 1973, includes two more Apollo lunar missions and three Skylab A missions: 28, 56, and 56 days. There are no approved manned flights after Skylab A; funds to study the shuttle concept have been approved by Congress, but the shuttle is not an approved program.

A NASA budget at or below the 1971 level (\$3.3B) over the next decade is not unlikely. Thus NASA's plans for advanced manned missions recede further and further into the future. A purely personal guess would be: manned shuttle flights (if, in fact, the shuttle is approved), 1980; space station, 1985; planetary flyby, 1995. Use of left-over Apollo hardware for Skylab-type earth-orbital missions during the 1970's is a distinct possibility.

### Questions

1. What are the major investigations relative to man's participation in spaceflight that should be carried out in your field(s) during the next decade or so? Please list in order of priority if possible. In cases where such investigations are discussed in earlier publications, are the earlier recommendations still timely?

2. How important are these investigations in terms of (a) man's survival in space, (b) man's well-being and performance in space, (c) the likelihood of the phenomenon under investigation actually occurring in space. Hence, do any of these investigations affect decisions to commit man to longer missions, and are any of them likely to be pacing items in planning future missions?

3. Which of these investigations could (should) be carried out on the ground, in ground-based simulations using man, inflight with man, inflight with animals? Would they require single or repeated experiments? Roughly how long might these investigations be expected to take assuming restricted levels of funding?

4. Considering all fields, what problems relative to man in space do you think are the most critical?