Mr. Thornton

JAN 13 1970

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
MANNED SPACECRAFT CENTER
Houston, TEXAS 77058

JAN 12

IN REPLY REFER TO: DB6-85

MEMORANDUM TO: KA/Manager, Apollo Applications Program Office

FROM : DA/Director of Medical Research & Operations

SUBJECT : Impact of 23.5 hour day on AAP medical experiments

The recent change to a 23.5 hour day for the nominal time line of AAP missions 2, 3, and 4 has a definite impact on the inflight medical experiments. The normal circadian (about a day) rhythm found in physiological and biochemical processes is well known and documented in the scientific literature. Therefore, the data collected at one time of the day could be statistically different from data collected at another time of the day with all other experimental conditions the same. We have attempted to circumvent this problem by requesting that in those experiments in which this phenomenon is known to be a major contribution of variability that the experiment be conducted at approximately the same time each experimental day.

The change to a 23.5 hour day invalidates this approach since there is no longer a normal physiological day or reference point. Although it has been shown that most circadian rhythms are able to shift by this small amount of time, there are individual differences as well as differences in the various physiological and biochemical processes. Therefore, this would introduce an additional experimental error which because of limited subjects is unacceptable.

The recommended solution to this problem is to remain on a normal 24 hour day. Any other solution will require additional baseline studies (which would ultimately have to include the actual crewmembers). An inflight measurement of selected variables would also have to be accomplished with sufficient frequency that the crewmembers' daily physiological and biochemical patterns could be established.

Original signed by
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