

UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH

Minutes of the Executive Committee
August 20, 1959
Washington, D. C.

The second meeting of the Executive Committee of the University Corporation for Atmospheric Research was called to order by Chairman Houghton on August 20, 1959, at 9:00 a.m., at Washington, D. C. in the Reading Room of the National Academy of Sciences.

Present were the following members of the Executive Committee: W. A. Baum, H. R. Byers, E. W. Hewson, A. R. Kassander, D. F. Leipper, T. F. Malone, J. M. Miller, and T. P. Wright; also present, ex-officio, H. G. Houghton, Chairman, M. A. Farrell, Secretary-Treasurer; and by invitation, Roy Wilkinson. Absent: P. S. Macaulay.

The minutes of the Executive Committee of April 3, 1959, were approved as amended. The amendment was that item 7 on page 3 of these minutes be understood to mean "signed by two officers" and that this action does not legally change the By-Laws but constitutes an executive order pending its inclusion in the By-Laws.

The Secretary-Treasurer reported that the membership fund in the amount of \$31,656.50 had been transferred to him from M.I.T. last April, and after payment of the Tucson meeting expenses of the Board of Trustees there was a balance of \$26,503.81. As authorized, \$20,000 of U. S. A. Treasury Bills due October 15, 1959, were purchased in July at 99.351111 at a cost of \$19,870.22, to yield 2.78 at maturity.

Chairman Houghton reported that it had not been feasible to transfer the NSF grant to UCAR and it would remain at M.I.T. The balance in this fund was approximately \$25,000. An extension of time in the use of these funds for an additional six months until January 1, 1960, had been obtained. The unused balance at that time would be returned to NSF to be used for other atmospheric research in the event NSF would have made another grant to UCAR prior to this time. Expenditures of approximately \$2,000 per month were authorized.

1. SELECTION OF A DIRECTOR

Dr. Houghton called on Dr. Byers as chairman of the committee to select a director. He said the Board members had suggested a total of 47 names for this position. At a meeting of the committee in Chicago on June 30, 1959, eleven names were placed in one of four groups as individuals having the

qualifications of scientific stature, administrative ability, leadership qualities, and "front man" characteristics that were desired. Of these eleven it was decided that Dr. Byers should approach Dr. Van Allen informally and determine whether he was at all interested in this position. Dr. Byers reported that on July 31, 1959, he had visited Dr. Van Allen and upon discussing UCAR had found that he was interested in what was proposed and that he voiced no objections to having his name proposed as director. Dr. Byers said he found Dr. Van Allen to be a straight-forward, uncomplicated, warm-hearted and energetic individual who was inspiring to and had the devotion of his colleagues. Dr. Byers informed Dr. Van Allen that the director needed the approval of the Board of Trustees of UCAR and that their next meeting was scheduled for October 20-22, 1959.

There was discussion of a meteorologist vs. a non-meteorologist as the director. Will the program stray too far from meteorology because the director is a non-meteorologist? Recognizing that one of the most difficult tasks will be to attract other disciplines into the Institute, won't it be easier to accomplish this with a non-meteorologist? An outstanding scientist with "glamor" will do much to sell the idea of the Institute to NSF and other government agencies, and the stature of the director could be a determining factor in the Institute's becoming a reality.

It was regularly moved and seconded that in the event the committee recommends a non-meteorologist for the directorship they be instructed that at the same time they recommend for the associate directorship a meteorologist.

Discussion of this motion pointed out that the director of the Institute should have some say in the selection of the associate director. Also, it was indicated that the man selected for the position of director would desire in selecting his assistant to broaden the top administrative level of the Institute.

The above motion was withdrawn with the understanding the minutes would present the gist of the discussion regarding the desired background of the associate director.

Since the eleven names selected from the list of 47 included five names of members of the Board of Trustees and because three of these men were members of the committee to select a director, concern was expressed as to whether the qualifications of these five men had been properly or adequately evaluated. A number of suggestions were proposed to do this including one that their names be submitted to the full Board for rating, that a new committee be appointed (made up of those who are not candidates) to consider those eminently eligible members of the Board whose names have been suggested for the position of director, etc. It was agreed, however, that the initial screening of names for the position of director was the responsibility of the Executive Committee, keeping in mind that the final selection will be made by the Board of Trustees.

It was regularly moved and seconded that all members of the Executive Committee except Drs. Houghton, Byers, Kassandra and Malone be constituted an ad hoc committee, with Dr. Wright as chairman, to give consideration to those members of the Board whose names had been proposed for director.

(This committee met the evening of August 20 in the Cosmos Club and made this report the morning of August 21. It is placed here for the purpose of continuity.) Chairman Wright reported as follows:

Your ad hoc committee for selection of a director of the Institute unanimously concurs with the conclusion of the original selection committee in the naming of Dr. Van Allen for the post.

In view of Dr. Van Allen's indicated interest, this ad hoc committee urges that every effort to gain his acceptance should now be made by the officers of UCAR.

In the unhappy event that Dr. Van Allen should decline the directorship, then this ad hoc committee of the Executive Committee, augmented by Mr. Macaulay and Dr. Kassandra, should be reconvened for the purpose of nominating another candidate for consideration of the Trustees. In performing such task it would use the findings of the selection committee.

Hewson, Leipper, Miller, Baum, Wright (Chairman)

Dr. Byers took the chair at 11:30 a.m.

2. TRUSTEES-AT-LARGE

There was a brief discussion of the subject "Trustees-at-Large." It was agreed that this was the responsibility of the nominating committee and the full Board.

3. AN/AMQ - 15

Wendell Hewson reviewed the termination by the government of the \$30 - \$40 million contract with Bendix Aviation for a weather reconnaissance system. He indicated that this research would produce information of value to the proposed Institute for Atmospheric Research. It was pointed out that the American Meteorological Society and the Committee on Meteorology of the National Academy of Sciences had been contacted and were aware of the situation.

Dr. Hewson's report was accepted with no specific action taken.

4. SITE SELECTION

Chairman Baum said the committee to select a site would meet in Chicago on September 9, 1959. He made the following points:

1. It will be difficult to make a strong defense for any site chosen.
2. There is no one dominant scientific criterion that governs the location of a site.
3. The committee has made up a list of possibilities based mainly on accessibility. Accessibility requirement is that the area be served by two separate airlines (there are 225 such areas in the U.S.A.).
4. The committee has had difficulty in interpreting the charge that they bring in the names of two or more areas. What is an area? They interpret it to mean within 25 miles of a stated location. They need to know on what scale to report. Should it be Jackson, Mississippi, or within the lee of the Rockies?
5. Need not be located at a member institution or at an institution. Institute may operate more efficiently if it is by itself. If part of a university -- land purchase and ownership, salary schedules, and over-all operations can be complicated.
6. Inevitable that choice will be a subjective process, and advice of Executive Committee at this time will be welcome.
7. Committee plans to bring in recommendations for two areas in October. Then have Executive Committee employ consultants to locate site within each area.

The consensus of the Executive Committee was that the site committee should recommend a large area, i.e., in the lee of the Rockies, rather than "about Denver." The need to make a decision was stressed. It was pointed out that NSF would be loath to allocate funds until a site is selected. Once recommendations are made, UCAR should act and take immediate steps to resolve and not allow the site selection to become a political football.

5. MEETING WITH REPRESENTATIVES OF NSF

Dr. Houghton welcomed Dr. Alan T. Waterman, Dr. Robert B. Brode, Dr. Randal M. Robertson, Dr. Earl P. Droessler, and Dr. Paul E. Klopsteg of NSF. He stated we were glad of the opportunity to meet with them as we needed their counsel and advice. He then invited Dr. Waterman to comment. Dr. Waterman stated that NSF was concerned with the problems of atmospheric research. He wished to get our thoughts around the table informally prior to

discussing our proposal with the Board of NSF and other interested federal agencies. Now that we have tools and techniques there are many inviting objectives to be determined in the upper atmosphere. The following objectives need consideration:

1. More capable people should enter this field. How to train and attract them into the field. Universities can do this as part of their graduate student program.
2. Consider what facilities are not now available and should be provided. Means of dealing with immeasurable amounts of data that quickly become available.
3. List major problems that have some promise of attack and that proper people can be obtained to work on them. Identify "real problems" -- not only those that need solution but those that can be solved. These problems tie in with graduate student training.
4. How should we work this out with the universities? What facilities are needed? One central institute or several? What problems need solving?

Dr. Waterman -- Does this sound like a good start?

Dr. Houghton -- Yes, this is essentially what we have been doing the last two years. Let's hear from some of the other members of UCAR.

Dr. Byers -- Glad to note Dr. Waterman's emphasis on manpower needs. Perhaps we need to encourage the establishment of more departments of atmospheric science at more universities. With regard to the identification of "real problems", who can say what problems are most important? Is it important if we could foretell what the weather would be on July 1, 1960? If the water in the atmosphere could be tapped, this in itself could well justify a large part of the effort going into the proposed Institute. Large weather problems might lend themselves to solution more readily at an Institute rather than at a university. Philosophy discussed briefly.

Dr. Malone made the following points:

1. There is no question of the need for atmospheric research.
2. Urgency in getting answers needs stressing.
3. Where can we go in weather modification?

In answer to Dr. Waterman's question, he said,

4. Basically, the Institute is going to dramatize the problems of the atmosphere.
5. The Institute will attract scientists from other disciplines

and will focus the attention of these scientists on the problems of the atmosphere.

6. Young people considering meteorology think the only job opportunities are in the Weather Bureau. This is not adequate. With an Institute as a focal point this thinking regarding job possibilities will change.
7. We don't need many more institutions for teaching but rather a strengthening of those now established.
8. UCAR report spells out what facilities are needed.
9. Seventeen conferences, each covering a selected scientific area, have led to the identification of important problems. They include:
 - a. Turbulence problem. Little is known. Special opportunity here to make advances.
 - b. Energy exchange in atmosphere. Virgin field.
 - c. Satellite measurements. Broad interdisciplinary attack required.
 - d. Institute can bring research of higher and lower atmosphere together and explore interaction.
10. The report has not stated how research would be done. This would depend on individuals and interdisciplinary effort.
11. Finally, as an outsider -- the universities that are most likely to be jeopardized are the ones that are most anxious to see the Institute established.

Dr. Waterman -- Good analysis, Dr. Malone.

Identifying problems in securing faculty and graduate student interest. Interesting outsiders depends on presenting important problems that can be solved. Can these problems be solved at a university, or must they be done at an Institute?

Dr. Malone -- Depends in large part on people. The consideration of problems with scientists in 17 areas indicated interdisciplinary effort could best be attained in an Institute.

Dr. Byers -- Transitions between disciplines can be made easier in tackling problems in an Institute. University deans do not coordinate interdisciplinary attack on problems, while a director of an Institute would.

Dr. Waterman -- In dealing with an "air group" or a large computing facility, you need one person who is responsible for having such facilities available.

Dr. Robertson -- Important question we face is how to have these facilities available to universities directly rather than in an Institute. How evolve a joint plan to do research? What are the long-range plans of the Institute? Can we initiate solution of problems now by people who are ready? Mobilize facilities that are sitting around. Get going immediately?

Dr. Houghton -- Scientists hesitate to take time off from present activities to undertake such major jobs.

Dr. Robertson -- Such arrangements are now underway by government with General Mills.

Dr. Houghton -- I think you are essentially describing an Institute setup.

Dr. Kassander -- An Institute can serve to catalyze the interests of scientists in atmospheric research and do away with the many little proposals.

Dr. Baum -- Assuming funds are available and they were all put at one university, this could be disastrous in that it wouldn't be in the interest of the field; if total facility is split among different universities the job becomes more difficult. Interaction at the intellectual level is required.

Dr. Robertson -- Many universities are on their way to having large-scale computers.

Dr. Houghton -- The need for computers is increasing faster than the number of computers. A separate computer is needed for meteorology. I believe the status of meteorologists at universities will be elevated by the Institute. We are talking of more than the normal anticipated growth that will occur at the universities. The Institute will induce a forced growth in atmospheric research.

Dr. Malone -- Envisage Institute will need computers not now available. Report mentions 7090 type but it will not meet all needs.

Dr. Wright -- Speaking from my experience in the last twelve years in another operation, I would comment as follows:

1. It is more difficult to obtain interdisciplinary effort at universities than is usually realized, because of teaching responsibilities and department, school, and college organization. This interaction is much more readily accomplished at an Institute.
2. Campus atmosphere is readily achievable at an Institute.
3. An Institute possesses a collection of unique facilities, all focused to resolve the same or similar problems.
4. There are advantages and disadvantages in being off a campus.

5. The common purpose of an Institute is a big advantage.
6. Can accomplish many objectives at one place.

Dr. Hewson -- An Institute provides an opportunity for faculty training and rejuvenation during periods of sabbatical leave.

Dr. Brode indicated he had a number of concerns about establishing an Institute. He raised the following questions:

1. If the Institute is to become the intellectual center of this field, what will keep all meteorologists from going to it?
2. Will the university faculties be depleted?
3. Will the Institute be able to establish interdisciplinary effort?
4. What will be the proportion of permanent and visiting staff?
5. Questions whether the Institute can train needed additional manpower as well as the universities.

Dr. Malone -- UCAR report answers many of the above questions beginning, "It should be clearly recognized..." (page 19, second paragraph).

Dr. Byers -- I think we might expect the Institute to be most influential in the horizontal (interdisciplinary) movement of people. The vertical (educational) movement of people would need to come from the universities.

Dr. Brode -- What kind of instruction will go on in the Institute?

Dr. Houghton -- It is visualized that graduate students would do thesis research at the Institute often under the supervision of their professors who were temporarily at the Institute.

Dr. Brode -- Would it be proposed to turn over expensive facilities for the use of students?

Dr. Houghton -- No. Gave example of procedure at M.I.T. and indicated similar process would probably be followed at Institute. Facilities such as flight squadron would not be turned over but would be available for instruction.

Dr. Kassander -- An Institute provides an opportunity to get bigger things done faster. Regarding training and manpower needs, all universities can handle more students. Although the professional needs for meteorologists cannot be met at this time, the demand is not by students.

Before leaving the group, Dr. Waterman summarized the previous discussion as follows:

1. We all see the problem of atmospheric research in much the same way.
2. It is an urgent problem.
3. The question of an Institute stands out because it is an expensive item.
4. The questions the NSF staff have been asking are those they are asked and must answer.
5. We are anxious to do what we can.
6. In order to make progress toward an Institute, we need to know:
 - a. The kind and type of facilities needed.
 - b. What problems will be undertaken.
 - c. What is the best way of handling each problem.
 - d. Small or large type Institute.
 - e. Where located.

It is recognized it takes time to develop an Institute, staff it, shake-down period, etc.

Dr. Houghton thanked Dr. Waterman for taking time out of his busy schedule to meet with the Executive Committee of UCAR.

Dr. Houghton -- We haven't answered Dr. Brode's question. If the Institute is so desirable a place, why won't many university people go there? There is no categorical answer. At institutes there are no students, no committees, no equipment problems, but personnel at such institutes are frequently looking for university opportunities. They do not return in many cases because of the salary differential. Main difference is the student atmosphere.

Dr. Brode -- If atmospheric sciences are to be developed at another 30 universities, there will be increased competition between universities and the Institute for personnel.

Dr. Houghton -- Where will the personnel to staff departments at another 30 universities come from? He believes it inevitable that the Institute and universities now having programs will both contribute to the manpower problem.

Dr. Brode -- Need to push horizontal flow since vertical flow is too slow. Age prevails.

Dr. Klopsteg -- The establishment of an Institute for Atmospheric Research is no different fund-wise or risk-wise than other researches supported with federal funds. "Let's take a calculated risk." "It may be a risk not to."

Dr. Malone -- If we are going to have big installations in government agencies, i.e., NASA and others, wouldn't it be wise to locate all these at universities and allocate funds in ratio to national importance?

Dr. Kassander -- The sum involved for an Institute is not large in comparison with other research activities, nor is a big explosion expected with regard to personnel. An orderly program and funding is proposed and since the program is in the hands of universities, necessary adjustments can be made.

Dr. Houghton -- Can you tell us whether the Federal Council on Science and Technology has a committee on atmospheric sciences?

Dr. Droessler -- Yes, the Council has decided to have an interdepartmental committee on atmospheric sciences. Dr. Waterman has been asked to reconstitute the NSF committee on weather modification.

Dr. Droessler commented as follows:

1. It is important that there be common information and planning among the federal agencies in order to insure that there will be no crossfire from the Bureau of the Budget.
2. When a program reaches millions of dollars it attracts more attention from more people. Atmospheric research figures in federal agencies are reaching large sums. He thinks NSF can perform an important service for agencies in serving as an over-all coordinator.
3. His primary interest at NSF has been the university program.
4. He has been impressed with the genuine interest of NSF in atmospheric research.
5. When the Institute is mentioned, many more questions arise. \$35 million is still big money.
6. Dr. Klopsteg commented that the report was imaginatively written and made a big impression.
7. Another problem regarding the Institute is that you are betting on people. He believes the director should be on the scene soon and spark the objectives of the Institute.

Procedural questions then arose. Should NSF approve organization of UCAR and the establishment of an Institute, and do we then employ a director? Need we ask NSF to allocate \$500,000 to UCAR, or would it be acted on automatically

at the next meeting of the NSF Board? In a private conversation, Dr. Waterman had indicated NSF would need to act on this item soon.

6. DR. HOUGHTON'S MEETING WITH CONGRESSMAN TEAGUE

Dr. Houghton said he, Dr. Waterman and Dr. Klopsteg had had luncheon with Congressman Teague and four other members of the Subcommittee on Research of the House Committee on Science and Astronautics. Congressman Teague said he felt his Subcommittee should visit a number of meteorological centers, and Dr. Houghton offered to give him a list of places to visit. To the question as to whether the Subcommittee would hold hearings on this matter, Congressman Teague said he anticipated they would. Dr. Houghton said he hadn't expected to work "on the hill" this year but it looked as though it would be necessary.

There was a discussion of the advantages and disadvantages of a hearing before the Subcommittee. The record developed by such a hearing is extremely valuable or even necessary if a floor fight is to be made on an appropriation for the National Institute. There is always the possibility that a hearing could lead to legislation that conceivably would be unfortunate. On balance, it seems that a hearing would be desirable.

This session of the Executive Committee meeting was adjourned for the day at 5:30 p.m.

August 21, 1959

The Executive Committee reassembled at 9:00 a.m., August 21, 1959, and acted on the report of the ad hoc committee (which is recorded in these minutes on page 3 for continuity).

Certain other routine items were covered and the meeting adjourned temporarily to meet the invited guests.

7. MEETING WITH REPRESENTATIVES OF OTHER FEDERAL AGENCIES INTERESTED IN ATMOSPHERIC RESEARCH

The meeting reconvened at 9:40 a.m. with the following representatives of federal agencies in attendance in addition to the members of the Executive Committee listed at the beginning of these minutes:

Lt. Gen. A. G. Trudeau, Chief of Research and Development, U.S. Army
Maj. Gen. H. H. Bassett, Commander, Air Weather Service
Brig. Gen. B. G. Holzman, Commander, Office of Air Force Research
Brig. Gen. Wassell, Headquarters, ARDC
Willis B. Foster, Department of Defense

Dr. A. G. McNish, National Bureau of Standards
Dr. Irving Gerring, Department of Health, Education, and Welfare
Dr. F. W. Reichelderfer, Chief of the Weather Bureau
Capt. William Franklin, Naval Weather Service
Dr. Paul E. Klopsteg, Chairman, Committee on Atmospheric Sciences, NAS-NRC
Dr. Hoyt Lemons, Department of Defense

Dr. Houghton welcomed the guests and said he had no prepared agenda or prepared statement. It is planned to hold an informal discussion of atmospheric research and ask for your comments, questions, and criticisms and to seek your support. If the establishment of an Institute is to be a truly national effort, it requires your assistance and participation as well as that of the universities. I will say a few words in summary of the situation so that you can then ask questions.

This program started when Dr. Reichelderfer asked Dr. Bronk of the National Academy of Sciences to appoint a committee on meteorology. The committee was appointed and went to work intensively. (The majority of members were outside the field of meteorology. Dr. Berkner was chairman, Dr. Klopsteg is now chairman.) The committee issued its report in January 1958 which it is believed will stand the test of time in being a most important document in meteorology. This report found that meteorology was inadequately taken care of for the welfare and safety of this country and made certain recommendations:

1. Atmospheric research at universities should be substantially strengthened.
2. A need for a National Institute for Atmospheric Research where an interdisciplinary attack could be brought to bear on the big problems of the atmosphere.
3. Recommended steps which would increase the scientific manpower in this area.

As an Academy committee, this report was made to Dr. Bronk but was widely distributed elsewhere.

Because the report emphasized basic research in the universities, the Academy felt the program should be taken up by the universities. The university groups concerned responded quickly, and within a month a University Committee on Atmospheric Research was formed which reviewed in great detail the ground the Academy committee had covered but from the standpoint of universities. The University Committee proved to be in complete agreement with the Academy report. Realizing a sense of urgency, the University Committee on Atmospheric Research has pushed along as rapidly as possible.

Each university has been doing what is possible to strengthen its program assisted by federal agencies.

The concept of a National Institute was new, however, and has required special study by a planning staff headed by Dr. Malone. This group called

together in small groups about 150 or about half of all atmospheric research scientists, and asked them about their research goals and what facilities would be needed to obtain answers. The planning group distilled their replies into an integrated plan presented in the report entitled "Preliminary Plans for a National Institute for Atmospheric Research."

To permit us to proceed as rapidly as possible, each member of the University Committee recommended to his university that a corporation be formed to carry forward the work and for the management of the Institute. This suggestion met with the wholehearted support of the universities and UCAR was incorporated last March.

This Corporation has submitted a proposal to NSF for the establishment of a National Institute for Atmospheric Research. This is where we have been and where we are. We know we haven't considered all problems; some areas are still not clear cut. There is still time to get your advice and thinking on this matter.

Let's back off and say a word about philosophy -- you have to start somewhere! Everyone concerned with the atmosphere is in agreement that the present status of our knowledge is inadequate and something needs to be done from the spectrum of pure science to applied and developmental science.

We feel thoroughly convinced that fundamental research is the root of the problem. It is designed as a national program in basic research in the atmospheric sciences. It is generally agreed that, everything considered, the responsibility for basic research is and will continue to be in our universities. The development of good scientists and basic research is the responsibility of the university.

For these reasons the first objective is the strengthening of atmospheric research at the universities.

Many of you gentlemen are concerned with our objectives in atmospheric research since the universities receive financial support from your agencies in this area. The question arises whether the establishment of a National Institute will weaken research at the universities. We believe not, or we would not recommend an Institute. If we strengthen the university program, why do we need something more? No single reason can be given, but a group of interrelated reasons can be presented. First, our atmosphere is very big and complex and to make progress on some of these large and complex problems that face us requires an effort that is commensurably complex and large. It also requires large and complex tools, and most important, it requires an interdisciplinary attack by chemists, physicists, mathematicians and meteorologists, each bringing his own talents and abilities. This interdisciplinary effort, we believe, requires a facility such as a National Institute. The scope of the problems to be tackled are too large for an individual university department. If a very large program were undertaken at a university it would unbalance the entire educational and research program of the department in an undesirable way. We also feel that bringing together chemists, physicists and mathematicians will be easier at an Institute than at a university (even though a university is supposed to be a community of scholars).

One of the most important problems in the way of expanding our effort is that of manpower. All present manpower are hard at work. There is no pool of unoccupied personnel to dip into; there is already a shortage. So it is necessary to expand our manpower in order to expand the program. Expansion would be more difficult if manpower were in one area, i.e., chemists, but the atmospheric sciences can and should draw on many disciplines including a cross-section of those trained in physical sciences. How do you bring this about?, i.e. physicists to atmospheric science. The challenge in atmospheric science is so great that once attracted to the field, many will remain.

In the final analysis, what we want is to have all of us on the same team. This is a national program, it isn't a university program; we all need to understand the total program, and we all have an equal stake in it. Universities were asked to take the initial steps, but the universities have no proprietary feelings -- it is a program for the nation.

Each of your agencies has particular interests in different areas of atmospheric science. Our concept and research interest is the total atmosphere. What is done will depend on the interest of researchers themselves and the agencies supplying funds.

Dr. McNish -- I am impressed with this report. Would the guest staff derive their income from the Institute or other sources?

Dr. Malone -- Both sources, probably...the nature of the problem would determine.

Dr. Gerring -- Are biological problems of the atmosphere, that would be of interest to HEW, included?

Dr. Houghton -- Yes. We think of this as a basic research Institute and it should not be thought of as a service unit to federal agencies.

Dr. Gerring -- Will scientists who work at this Institute be able to select their own problems and not be directed by an advisory committee?

Dr. Houghton -- Yes...similar to the operation at a university.

Gen. Trudeau -- Would you define the term "atmosphere"?

Dr. Byers -- It includes solar atmosphere.

Gen. Trudeau -- Would this take you into studies in the atmosphere around the moon?

Dr. Houghton -- Yes, Dr. Hess of Florida State has been interested in the atmosphere around other planets. We are mainly interested in the earth's atmosphere rather than interplanetary space.

Gen. Trudeau -- Does this have to do with radiation in space?

Dr. Malone -- Yes.

Dr. Houghton -- Our definitions are broad enough to do what the people concerned are talking about. We are thinking of an Institute of 100 people and we can't do everything.

Gen. Trudeau -- This Institute can possibly coordinate and be the management group of the total picture in atmospheric research for the nation.

Dr. Houghton -- We have discussed this but we wouldn't trust ourselves with this responsibility. We don't think any one group is wise enough to grapple with the total problem.

Gen. Trudeau -- The Institute can be a scientific clearing house rather than a management clearing house.

Gen. Holzman -- The main problem is money. We need to have a project that conforms with ARDC objectives (basic research is O.K.). I think the universities will be hurt. As this is a national effort more than one agency should support it, since depending on support from one agency is not too stable.

Dr. McNish -- Isn't it understood that an agency such as NSF will provide funds?

Dr. Houghton -- Yes.

Dr. McNish -- Will ONR be expected to contribute?

Dr. Houghton -- I am glad you raised this question. We are expecting support from NSF. It is being funded as a separate item in the NSF budget. Since it is a basic research facility NSF was the logical agency from which to request support. What is expected from the Army, Navy, Air Force, etc., is a continuation of present support for university research.

Dr. McNish -- Are you talking about financial support? I thought you were getting it from NSF.

Dr. Houghton -- Yes, we expect funds from NSF for the Institute but hope for continued support at universities from other federal agencies.

Dr. McNish -- If a professor from Podunk wants a grant, will it go to the Institute?

Dr. Houghton -- No.

Gen. Trudeau -- Have you talked with Dr. Dryden or Keith Glennan?

Dr. Houghton -- Yes. Dr. Dryden is out of the country or he would be with us today.

Gen. Trudeau -- The Science and Space Committee will ask whether we are doing the same things they (NASA) are.

Dr. Houghton -- We don't expect to ask your agencies to support the Institute, but since it is such a large item in the NSF budget we hope you will lend your support to their budget requests. Dr. Waterman indicated yesterday he wanted to get the opinion of other federal agencies about the Institute since it is a national program. We have been in contact with the Subcommittee on Research and Development of the House Committee on Science and Astronautics.

Gen. Trudeau -- Good.

Dr. Malone -- This program should complement their program and not compete.

Dr. Gerring -- It appears that if NSF supports the Institute there will be less funds for universities?

Dr. Klopsteg -- The intention of NSF is definitely not to reduce funds to universities for atmospheric research.

Dr. Reichelderfer -- Will the item for the Institute be a line item in the budget, and will the item for university research be a line item in the budget?

Dr. Klopsteg -- Yes, they will be separate line items.

Dr. Gerring -- Will men be able to do their thesis research at the Institute?

Dr. Houghton -- Yes, we want students included.

Dr. McNish -- Isn't this up to universities?

Dr. Baum -- Yes. These patterns are well established in graduate schools today.

Dr. Klopsteg -- As long as the laboratory is operated by a group of universities, the problem is less complicated.

Dr. Reichelderfer -- Keep in mind the need of funds for university atmospheric research and the need of Institute funds. The needs for information on atmospheric research are tremendous and I could fill the room with fund needs. Somehow there must be a much larger appropriation for atmospheric research.

Dr. McNish -- How much of the program will be devoted to the ionosphere, air-glow, aurora, etc.? Or will the program concentrate on meteorology?

Dr. Houghton -- This will be determined by the interests of the people at the Institute. We intend to get the best people we can to go there and give them as much freedom as we can to follow their own interests. High atmosphere research may be quite prominent or perhaps too few people interested in this area might be found. The plan in the report is based on a program outlined by 150 meteorologists; not the program, but what it might be if these 150 went to

the Institute. We do not plan to outline the program and then get people to do it, but vice versa.

Dr. McNish -- Atmosphere electricity should be included.

Dr. Wright -- Cornell was invited to participate even though they were weak in meteorology but strong in research in the upper atmosphere.

Dr. McNish -- We are interested in radio meteorology.

Dr. Byers -- The Institute should not try to set up massive equipment to answer detailed questions about the solar system nor launch rockets to explore geomagnetic problems around the earth. One thing the Institute could do is initiate studies of possible relations of weather to geomagnetic events.

Dr. McNish -- I believe we should have some contact with the upper atmosphere.

Dr. Baum -- One reason the program cannot be elaborated in detail is that we don't know enough. Is the atmosphere a self-contained unit? How much is it externally controlled? What is the interrelationship of ionosphere, troposphere, etc.?

Dr. Reichelderfer -- The Weather Bureau doesn't want to be a three-plane air force. I believe in the Institute taking over this responsibility. It belongs in the Institute rather than being a political pressure unit.

Dr. Byers -- This is a sizable item in the budget; the Institute can go a long way in filling the need for research with airplanes.

Gen. Trudeau -- Would an essential part of the Institute's responsibility be that of making grants to scientists in Japan on atmospheric research?

Dr. Malone -- No.

Dr. Klopsteg -- The charter of NSF is being amended to permit them to make grants to foreigners.

Dr. Houghton -- We hope to have foreign scientists working at the Institute rather than just supporting foreign scientists. DOD agencies are now making research grants to foreign scientists and we hope they will continue this practice.

Dr. Gerring -- Has any consideration been given as to whether 150 scientists are available? To what extent would the universities be raided in obtaining them?

Dr. Malone -- It would be a gradual build-up and we would not need to raid the universities unduly.

Dr. Baum -- The 13 universities now making up UCAR employ the major share of personnel and we are not about to cut our own throats.

Dr. Houghton -- The experience at Brookhaven and other institutes has shown universities are not raided (sabbatical leaves, mutual exchange). Some personnel go from Brookhaven to universities. This will make available to all universities facilities not on their own campus.

Gen. Wassell -- I support the proposal. One thing needs clarification: There is already a national program and the Institute will not change this picture much. It will be a complementary device to educate students in that it will focus on opportunities in this field. The Air Force will continue the present support of atmospheric research.

Gen. Holzman -- Augmented funds for augmented program. This is the issue here.

Dr. Kassander -- Various agencies have specific mission by legislation. The Institute will not compete but the Institute will strengthen the total atmospheric research so that the manpower program will be strengthened and in turn the program of the federal agencies. We need to start with a plan and the report is not exclusive.

Dr. Baum -- There is an enormous problem area here to which we have devoted relatively little effort. No doubt additional funds will be provided for the total atmospheric research effort in the next five to ten years.

Gen. Wassell -- Is it desirable to have a definition that might show what the Institute will not do? Congress may well state in the future when federal agencies request funds -- why not let the National Institute do this?

Gen. Bassett -- Conventional airplanes have been with us for some time. The major share of weather funds are now outside of the Weather department. Planes and equipment are costly.

Dr. Malone -- The report assumes the Air Weather Service will continue the large and very costly installations required for weather reconnaissance.

Gen. Bassett -- I realize this is the premise, but I am not sure it is a good premise.

Dr. Byers -- It would be a blow if the present Air Weather Service reconnaissance were to be discontinued. The Institute is considering only a couple of DC-6's. The world-wide air reconnaissance will still be needed.

Gen. Bassett -- I realize the premise was made in the Institute report, but planes are extremely expensive if not used fully.

Dr. Foster -- Has anyone estimated what the additional costs will be to the federal agencies over and above the NSF contributions?

Dr. Malone -- There are no hidden costs.

Dr. Foster -- Except for costs of airplanes there are no hidden costs. What are price tags to agencies over and above those in report?

Dr. McNish -- I don't anticipate the program will cost any more to the Bureau of Standards.

Dr. Kassander -- Proposals would be made to DOD as is now done.

Dr. Houghton -- It is implicit in our plans that no agency funds other than those from NSF are required for the Institute.

Dr. Byers -- There is a general forward movement in atmospheric research, and those concerned with budget making will need to give additional support for atmospheric research.

Dr. Houghton -- Do we want to further discuss contract support at universities by the agencies represented?

Gen. Holzman -- DOD has taken a big step forward in providing longevity (two-three year contracts).

Dr. Foster -- Grants rather than contracts offer considerable improvement.

Gen. Holzman -- Have these been implemented?

Gen. Trudeau -- No, but they will be in the next few months.

Gen. Holzman -- It is the university's responsibility to determine whether a professor receives salary from a contract. Some federal agencies think a professor on tenure should not be paid from the contract. The government frequently asks that work be expanded and additional staff employed. The government needs to pay a reasonable share. Grants will do away with the difficulty. Contracts were developed for hardware research.

Dr. Houghton -- Basic research was formerly a dirty word, hidden under other names.

Dr. Reichelderfer -- What is the timetable for the Institute? \$500,000 this year; where do we go from here?

Dr. Houghton replied as follows:

1. Reviewed this year's effort.
2. \$500,000 for the year 1960; requested \$1.2 million for 1960.
3. Architectural planning and site selection to be undertaken this year.
4. NSF has not yet acted on our proposal.
5. We met with five men of NSF yesterday. There were no commitments made, but the matter will be discussed by the NSF Board later this month. Dr. Waterman says the decision will be made within a month. No idea of the sum.

6. May not be able to do all we planned this year. We could employ a director and a key staff and get plans underway.
7. In the \$1.2 million, \$700,000 was for architect's fees and this sum probably could not be spent in one year even if we had it.
8. Big item -- construction and getting equipment.
9. Second year.
 - a. Includes \$10 million for actual construction.
 - b. Additional funds to increase staff.
 - c. Get research underway in temporary quarters.
 - d. Get bids - three months, construction - 18 months.
10. It is estimated it would require six years to bring the Institute to planned level of operations.
11. Having lost some time, we probably will require \$5 - \$10 million next year.
12. The key amount is next year's appropriation. If we are successful in obtaining \$5 to \$10 million, the Institute would be a reality.

Gen. Trudeau -- Do you have any idea where site will be located?

Dr. Houghton -- Top secret. Working on it. No decision.

Gen. Trudeau -- Does NSF, based on other work with Bureau of the Budget, know how this will be received?

Dr. Houghton -- They undoubtedly do but haven't told us.

Gen. Trudeau -- Suppose you get only a fraction of what you need?

Dr. Houghton -- We have thought of alternatives of course! Would be reluctant to occupy beat-up buildings.

Dr. Reichelderfer -- Does your group know of the film "Isles from Outer Space"? Walt Disney meteorology and wonder-wonderland.

Dr. Houghton -- How will it be released?

Dr. Reichelderfer -- Buena Vista film in October.

The meeting stopped for lunch. The guests expressed themselves as being in favor of UCAR's plans for an Institute and were appreciative of being kept informed of the Corporation's objectives.

The Executive Committee reconvened with Chairman Houghton, Dr. Byers, Dr. Baum, Dr. Hewson, Dr. Leipper, Dr. Kassander, Dr. Wright, and Dr. Farrell.

Dr. Houghton indicated he will send expense vouchers for this meeting from M.I.T. and that expenses will be paid from the NSF grant.

8. NSF CONTRACT

In discussing a contract for funds with NSF following action by the NSF Board, it was agreed that the management fee should be kept where it is rather than reduce it.

It was regularly moved and seconded that in contracting with NSF the officers of the Corporation, P. S. Macaulay, and legal counsel be authorized to act for the Corporation in accordance with Article VIII of the By-Laws. The motion carried.

9. SELECTION OF A DIRECTOR AND RELATED PROBLEMS

In considering how to keep Dr. Van Allen informed of UCAR's activities, it was agreed that Dr. Byers would indicate to him that the Executive Committee was enthused to learn of his interest in UCAR and inform him that the full Board would act in October.

It was also agreed that the Executive Committee would need to work out the details of recommending a director to the Board of Trustees at the October meeting.

Legal counsel was asked to consider the following:

- a. Tax advantage of providing a house for the director or other items.
- b. Fringe benefits.
- c. Tenure.
- d. Eligibility for TIAA insurance.

It was recommended that counsel make a trip to Brookhaven and become familiar with AUI's plan of operation dealing with the above and similar items. He could find out what changes they would make after operating under their plans for a number of years. A contact would be through their legal counsel, Charles Dunbar. Dr. Wright would like to take this matter up with AUI before we move on it.

A question was raised about the above action conflicting with the responsibilities of UCAR's Personnel Committee. The Secretary was asked to

notify the chairman of the Personnel Committee that counsel would be getting the above information from Brookhaven and that counsel might invite the chairman to accompany him or make whatever arrangements he wishes so that the Committee might have access to what information he might obtain.

10. UCAR FELLOWSHIP PROGRAM

Dr. Houghton said UCAR had received \$45,000 for the support of fellowships by the Sloan Foundation; a one-year program to provide ten fellowships -- \$4,000 each, and \$5,000 for expenses. This money was granted late last year and the committee, chaired by Dr. Neuberger, made only four awards. The remaining funds will permit the award of six fellowships for the 1960-61 academic year.

It was voted to authorize the Chairman to appoint an individual to manage the fellowship program including the printing and mailing of announcements and applications. (The Chairman has since appointed Dr. Hans Neuberger of Penn State.)

It was voted to request the Chairman to approach the Alfred P. Sloan Foundation to seek additional funds so that ten fellowships can be awarded for the 1960-61 academic year.

In the discussion, it was the unanimous opinion of the Executive Committee that the fellowships should be open on an equal basis to meteorology majors as well as to majors in other appropriate fields of science and engineering. Although the primary objective is to attract students from other fields into the atmospheric sciences, the arbitrary exclusion of meteorology majors results in an untenable situation.

11. PUBLIC RELATIONS

A general discussion of the need for public relations was held. The names of the editor of the Hartford Courant and of the retired M.I.T. news director were mentioned as examples of individuals who might provide the necessary professional approach. It was also pointed out that Life magazine is considering a future article on the atmospheric sciences when a suitable event makes it timely. The appointment of a director of NIAR might serve a suitable stimulus. In any event it was considered desirable for UCAR to hold a news conference when the director is appointed and the preliminary plans for NIAR are announced. No formal action was taken on this matter.

The meeting was adjourned at 4:05 p.m.

M. A. Farrell
Secretary-Treasurer