UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU
WASHINGTON

November 17, 1961

IN REPLY, PLEASE ADDRESS
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MEMORANDUM

TO : Area and State Climatologists, Field Aides (HC), Field Aides, WRPCs, River Forecast Centers, River District Offices, and Area Engineers (with copies to Regional Offices for information)

FROM : Director, Climatology

SUBJECT: Climatological Services Memorandum No. 90

1. MINUTES OF THE 12th MEETING OF THE COMMITTEE ON CLIMATOLOGY ADVISORY TO THE U.S. WEATHER BUREAU OF THE NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL: The Committee, consisting of Dr. W. Reifsnyder (Chairman), Dr. G. Benton, Dr. D. Carter, Dr. J. Mather, Dr. D. Miller, Dr. N. Volk, met at the Office of Climatology in Suitland, Maryland, on October 5 and 6, 1961. The Secretary of the Division of Earth Sciences (NAS-NRC), Dr. Linn Hoover, was also in attendance for the major portion of the meeting.

Since three of the members this time were new to the activities of the Committee, a briefing on major activities in climatology in the Weather Bureau was presented by staff members of the office.

Dr. Landsberg briefly reviewed the present status of manpower (about 550) and funding (S & E $3,000,000; working fund $1,500,000; R & D $300,000). At Washington the work is handled by three branches, with an additional major operating branch (National Weather Records Center) located at Asheville, N. C. The physical facilities in Federal Office Building 4, Suitland, were briefly inspected.

Members of the Investigations Branch presented highlights of the projects now under way.

Greenland Project (Mr. Putnins). Studies completed include the temperature distribution over the ice caps, interdiurnal temperature changes, temperature trends; inflow - outflow study. Continuing is research on the circulation regime, winds over the ice cap and meso-scale study of the Thule area.

Air Pollution Climatology (Mr. Frederick). Completed phases include the development of an index of pollution potential and representativeness of wind station network at Nashville, Tenn. A study on the contrast of weekday-Sunday precipitation in polluted areas is in progress. In this connection the chairman quoted the suggestions of Dr. Hewson, former committee member, on desirable climatological studies in this field.

Mr. Palmer presented the results of his drought studies and stressed the aim of developing an index for comparisons of droughts in time and space. This effort is now coming to fruition and 5 classes of drought (incipient, mild, moderate, severe, extreme--the last corresponding to "disasters" in Department of Agriculture terminology) have been defined. An analysis of 71 years of data in western Kansas and 30 years in Central Iowa showed, e.g., that in the former area 6% of the months were in the "extreme drought" category and only 1% in the latter region. A major report is forthcoming. The further objective is to develop a machine program for the new procedure and possibly apply it to weekly data.

The difficulties arising for climatology from the hygrothermometer installations were discussed by Mr. Ratner on the basis of comparisons for 60 stations. Although compatibility to older installations was found in many instances, microclimatic differences (most pronounced on clear days with light winds) were numerous. The installations also showed deficiencies of many older installations, where extraneous influences on exposures caused considerable problems. The committee expressed its desire for much improved methods for station inspections during the discussion of this item.

Fosdic II camera and reader were discussed by Mr. Bosen. The superior characteristics of the new system make it possible to cope with the 30 million annual punch card inflow into the National Weather Records Center. The capability of going from film input to magnetic tape output will increase the usefulness of the Fosdic II system. The intent to develop new devices for reducing radar and satellite pictures to climatic data was presented.

Mr. H. C. S. Thom indicated the scope of his consulting services with the examples of the design wind studies and the degree day data work. The former, originally undertaken for the Bureau of Public Roads applied extreme value distributions to observed wind data and is now accepted by the Society of Civil Engineers as a standard. The latter study is used by the Department of Health, Education, and Welfare as guidance material for fuel use estimates in relief cases. Another study on snow-load design data is underway for the Department of Agriculture.

Mr. Blanc introduced members of the Advisory Branch staff. Mr. Creasi briefly presented the scope of Foreign Area Section work. This included the annotated bibliography work for the Air Weather Service, the foreign translation work for the Signal Corps, and the CLIMAT broadcasts for the WMO. Members of the Committee commented favorably on the quality of the translations.

The marine work was covered by Mr. Cooperman including the primary work on marine climatological summaries for the Hydrographic Office and Coast and Geodetic Survey. The purpose of the Mariners Weather Log was explained. The progress of work on the Climatological and Oceanographic Atlas for Mariners was discussed. The international cooperation on marine punch cards was briefly mentioned.

Mr. Baldwin indicated in the Domestic Area work the long tradition of the Weekly Weather and Crop Bulletin and close cooperation with the Department of Agriculture. Pamphlets and sheets on climatic events and information for the

U. S. fill many needs. A major effort is now being directed toward completion of the climatological charts for the National Atlas. A total of 26 sheets containing 96 charts has already been published.

For the Field Services Branch, Mr. Harshbarger gave a brief review of the size and capabilities of the National Weather Records Center. He stressed the fact that we are striving for continuously increasing the professional competency of our personnel. The machine potential has been increased through the recent installation of the Minneapolis-Honeywell 800 computer.

The cooperative observers, as outlined by Mr. Hagarty, are the main-stay of the country-wide climatological survey. This is the first year in nearly a decade when funds were obtained to expand the network into poorly covered areas. Equipment for 265 new stations will be obtained. The role of the Weather Records Processing Centers and the awards program for observers was explained.

Good progress is being made on the Decennial Census of Climate, according to Mr. Lippmann. New monthly normals of temperature, precipitation and degree days will be available for 307 Weather Bureau stations and about 3200 lower order stations. These will be put into use by January 1962. Daily normals of temperature and degree days for Weather Bureau stations are in the process of computation. Hourly data summaries are planned first for 34 high-priority stations, primarily important international airports and large cities. By-products of the census work are monthly averages for 1931-1960 period for the climatic subdivisions of states.

Dr. Landsberg outlined the present status of cooperative agreements with universities. In most instances no funds change hands, although a few small contracts are underway with Iowa State, Kansas, Missouri, and Wisconsin. The latest reports on these studies, primarily dealing with moisture problems were shown. Some schools are helped in their research efforts through loans of equipment. Most extensive is the punch-card exchange program.

The Office of Climatology is engaged in a small but persistent training effort, where possible in cooperation with universities. All staff members are encouraged to take individual courses to up-grade their proficiencies. Where possible, advantage is taken of the Weather Bureau scholarship program.

The State and Area Climatologist program was discussed by Mr. Joos. The routine and non-routine tasks of the State Climatologists were outlined. The trend has been to remove most routine tasks of the old Section Centers to other parts of the organization and to stress non-routine professional activities in our field program. The major projects with the agricultural experiment stations (NC-26, NE-35, S-47, W-48) and the important role of the area and state climatologists in these were presented. The gratifying results from these projects amply justified the effort.

The filling of further jobs by full-time state climatologists is contemplated. This fiscal year New York state job will be filled. Three more are in the budget estimates for FY-1963. The liaison through meetings and visits by area climatologists was brought out.

This presentation was followed by a lively discussion. The advantages and disadvantages of college campus locations were weighed. The need for other than agricultural research studies by state climatologists was noted. The possibilities of adding, at a later date, staff to the area climatologists' offices were raised. These might be specialists for area-wide studies on climatic problems common to several states in the fields of air pollution, industry, recreation, etc.

The important problem of getting properly trained climatologists for the expansion of the program and future attrition will remain a matter of major concern.

Copies of the 10-year plan for climatology in the Federal Government prepared by Dr. Landsberg for the Interdepartmental Committee on Atmospheric Sciences were given to committee members for information and comment. The ICAS accepted this plan at its 2 October 1961 meeting for forwarding to the Federal Council on Science and Technology. The hope was expressed that this plan would become a portion of the larger plan for Atmospheric Sciences.

In the discussion members of the committee raised the question on how to stimulate enthusiasm for climatology. This is at the root of the formidable recruiting problem. For an expanded program, cogent suggestions include for future plans the problem of areal climate in contrast to point climate for the studies of drought and water economy problems. The hope was also voiced that before the end of the decade climatology can expand from continent-bound thinking into truly global proportions. Other themes worthy of exploration were field experiments on inducing local climatic changes and the groundwork for estimating climatic effects of weather control attempts. In addition to farm-land climatology a development into wild-land climatology seems to be an essential counterpart.

The chairman gave a status report on the grand plan for Atmospheric Sciences. At the request of the President's Science Advisor, the National Academy Committee on Atmospheric Sciences undertook to formulate such a program. The work, which took place under Dr. Sverre Petterssen's direction, is almost complete. A number of task forces met and prepared recommendations. Dr. Sargent, for example, was Chairman of a group concerned with biometeorology. Copies of the Petterssen report will be obtained for the committee as soon as they become available for general distribution.

The committee discussed its future work program. A report and recommendations will be most helpful in the budget estimate preparation for FY 1964 next spring. A tentative meeting date for the end of February was discussed. The possibility of meeting at Rutgers University was advanced.

2. CLIMATIC GUIDES: The Climatic Guide for Seattle, Washington, and the adjacent Puget Sound Area, Number 40-45 in the "Climatography of the United States" series, has recently been published. This 48 page pamphlet treats the climate of this area in considerable detail. Similar guides were previously published for Baltimore and New York City.

3. DR. MITCHELL'S TRIP TO EUROPE: Dr. Mitchell has recently returned from a 7-week trip to Europe which included attendance at the 6th Congress of the International Association of Quaternary Research (INQUA), the 75th Anniversary Meeting of the Sonnblick Observatory (Austria), the 3rd Session of the WMO Commission for Aerology, and the WMO-UNESCO Symposium on Changes of Climate. Here are Mitchell's comments on this trip:

"The INQUA Congress, held in Warsaw September 2-7, was attended by more than 500 paleo-scientists from many disciplines, including a small handful of climatologists, representing about 40 nations. Some 40 Americans were present, including 15 members of the U. S. National Committee for INQUA. The nations represented ranged from the U.S.S.R. to New Zealand, and from Communist China to Ghana. The program included several interesting addresses in plenary session, with simultaneous translation in English, French, German, and Russian. These were by R. F. Flint (Yale), J. Dresch (France), H. Godwin (England), Gerasimov (U.S.S.R.), and others. Numerous meetings of the various intradisciplinary sections, commissions, and subcommissions of INQUA were also programmed, but without the benefit of simultaneous translations, and with such extensive overlapping that it was impossible for an individual participant to share in more than a tiny part of the proceedings. To summarize the technical proceedings here would beneither easy nor perhaps very relevant to the interests of most of us. INQUA plans eventually to publish these proceedings, however.

"Our Polish hosts were active participants of the Congress. They had made numerous valuable contributions to the study of Quaternary phenomena in Poland - a highly interesting geographical area in such a context - and had elaborately published many of these contributions for distribution to the Congress participants. The Poles also arranged for several interesting scientific excursions to the environs of Warsaw, which were enjoyed by many Western participants no less for the unique opportunity they offered for observing at first hand rural life under Communist rule in Poland.

"I was surprised to find Warsaw so advanced in its recovery from the ruins of war, and to find her people so cheerful, well-dressed, and well-informed (via Western radio) while at the same time unrestrained in lamenting their post-war political plight. The average Pole is no more enamoured of his Soviet neighbors than he is of the Germans, toward whom he continues to hold mistrust and resentment. For me, this part of the trip was a real "eye opener" in my political as well as my scientific education.

"The Sonnblick meeting, held September 7-9 (in the rain!) in the beautiful mountain village of Rauris near the base of the mountain, was attended almost entirely by Austrians, Germans, and Yugoslavs. I was the only non-European among about 200 participants and I confess that a better knowledge of the German language would have served me well! The meeting was past the half-way mark by the time I could reach it from Warsaw, but I nonetheless had a welcome opportunity to meet many renowned European meteorologists for the first time. My purpose in going there was to read two papers at the conference for their authors, Saul Price and Jack Pales, concerning the Mauna Loa Observatory in Hawaii and a report on some of its recent research activities of mutual interest. Although I read the papers in English, there was apparently

no difficulty in making myself adequately understood. The program was otherwise an impressive compendium of reports on alpine meteorological and climatological research, primarily relating to the Alps. A sprinkling of contributions by Yugoslav speakers was of a far lower quality. The rain and clouds were so persistent during my two days in Rauris that I never so much as caught a glimpse of the famous mountain-top observatory whose 75th Anniversary we were commemorating. Needless to say, that was disappointing.

"After a few healthful days of leave in the Swiss Alps, I proceeded to Rome, where the WMO Commission for Aerology held its third quadrennial session from September 18 to October 2 in the handsome and comfortable headquarters building of the Food and Agricultural Organization. As my first experience of this kind, I was greatly impressed by the adeptness of the WMO Secretariat, especially Mr. Ashford, and of the outgoing President, Dr. Sutcliffe, in keeping the meeting moving efficiently and constructively. I was no less impressed by the competence and cogent leadership of the American delegation, consisting of Drs. Cressman, Houghton (MIT), and Johannesson (A.W.S.). As an "advisor" to this delegation, I felt rather like a "fifth wheel". It was obvious, however, that, had the political controversy characteristic of some previous WMO sessions developed, the sailing would not have been so smooth; there was little chance of anticipating this.

"Most of the work of the Session was accomplished by two shirt-sleeve committees chaired respectively by Dr. Cressman and Dr. Godson (Canada).

"Four technical seminars were held in plenary during the Session, concerned respectively with the upper atmosphere, numerical weather prediction, long-range forecasting, and the general circulation. Dr. Cressman offered two well-received contributions to these seminars, including a report on the TIROS satellite program and one on the JNWP operations. Mr. Namias arrived in Rome just in time to make a valuable contribution to the seminar on long-range forecasting.

"On the same day that CAe-III disbanded, and left itself in the hands of its newly elected President, our own Dr. Cressman, there convened the Symposium on Changes of Climate. Sponsored jointly by the WMO and the UNESCO Arid Lands Unit, this Symposium was launched with customary ceremonial fanfare, followed by an interesting address by Dr. Luna Leopold (USGS) in which he appealed for a worldwide network of hydrological benchmark stations and for active support of the IUGG's recent proposal for an "International Water Decade".

"With a conference on climatic changes held only 8 months before at the New York Academy of Sciences, the proceedings of which had not yet been published, I was frankly doubtful that much new would come from this second conference. However, as a result perhaps of the much broader international participation in Rome, and of a deliberate effort on the part of many (if not all) who did attend both conferences to avoid redundancy, this symposium turned out to be quite rewarding.

"The first day's session, chaired by R. G. Veryard (U.K.), dealt with observed changes of climate during the period of meteorological records. Following a

useful lecture by R. Sneyers (Belgium) on statistical methods appropriate for studies of climatic change, we heard brief reports on changes found in India, North and South Africa, the Middle East, Italy, and the Ukraine. Other contributions to the session included a remarkably comprehensive review paper on recent studies of secular climatic change throughout the world, prepared by Mr. Veryard; a provocative study of sea-surface temperature anomalies in the North Atlantic since 1951 by M. Rodewald (Germany); a detailed climatic chronology for Europe dating from 800 A.D. by H. H. Lamb (U.K.); and two studies of world-wide climatic variations in recent decades by L. Lysgaard (Denmark) and myself.

"The second day's session, chaired by K. W. Butzer (Univ. of Wisconsin), was devoted to the evaluation of indirect indicators of climatic change during the past several thousand years. Coming under rather critical scrutiny were evidences from paleosoils, anomalous archeological finds (in the Sahara and in the U.S. Southwest), beach terraces, tree-ring series, pollen sequences, and the general problem of deriving absolute chronologies from such evidence by radioisotope methods. This session left me with the clear impression that, notwithstanding the extraordinary variety of evidence for post-glacial fluctuations of climate, such evidence can be, and often is, very inexact if not downright misleading. A lengthy shake-down period must probably be awaited before the climatologist can take such evidence as quantitatively trustworthy.

"The third day was devoted to theories of climatic change. The chairman, R. C. Sutcliffe, opened this session with a far-sighted introductory statement that, like Dr. Rodewald's contribution two days earlier, reflected a ground swell of feeling among many symposium participants that we should be looking to the oceans as a principal cause of recent climatic fluctuations. J. Bjerknes and J. Namias soon followed with additional empirical support for such a notion. Other contributions by B. L. Dzerdzeevskii (USSR), W. L. Godson (Canada), J. S. Sawyer (U.K.), and A. Obuljen (Yugoslavia) dealt primarily with various aspects of the effect of solar variability on climate. E. Kraus (Australia) and H. Flohn (Germany) supplied interesting material along other lines. Virtually all of these contributions were worth while, and a few, like those of Kraus and Sawyer, were refreshingly original and objective in character.

"The fourth day was ostensibly to be devoted to the practical significance of climatic change, although some of the contributions to this session seemed to beg the issue: i.e., evidences of ancient cultural dislocations were interpreted as evidences of climatic change, which in turn were invoked to justify the dislocations. One is forced to recognize that, especially in arid lands, many dislocations probably resulted merely from over-depletion of initially scarce water resources. Without more reliable independent evidence of historical changes of climate than we appear to have, one is greatly handicapped in evaluating the practical consequences of such changes.

"However, as brought out by L. P. Smith (U.K.) in the last paper of the day, important practical implications of climatic variability in the period of meteorological records can be demonstrated. These implications are no less real or important, incidentally, if the climatic variability is indistin-

guishable from a random (stochastic) series, a well-documented point that, right to the end of the conference, obviously failed to impress at least one outspoken statistician attending the symposium!

"The fifth and final session was probably what the UNESCO representatives present were waiting so patiently to hear. That consisted of a masterful summary and evaluation of the contributions to the Symposium by C. C. Wallén (Sweden), and a down-to-earth discussion of the extent to which the present state of our knowledge of climatic change might be useful in the rational management of the arid lands of the world. It is not for me to say whether UNESCO found the Symposium of any great value, although I suspect that we all left Rome happy for this opportunity to get together, and with a renewed appreciation for what we do not yet know about the forces controlling the climate of our planet.

"Preprints of some of the contributions to this Symposium are available from the Weather Bureau library. The full proceedings will be published as a UNESCO Arid Zone Research Monograph."

4. RECORD-BREAKING COMMERCE PUBLICATIONS SALES: The following is from a memo from the Secretary of Commerce to Heads of Bureaus and Offices:

"Three records connected with the sale of Department of Commerce printed materials were broken in fiscal year 1961:

"TOTAL SALES of publications, maps, charts, copies of patents, etc., passed the $5,000,000 mark.

"PUBLICATIONS SALES through the facilities of the Superintendent of Documents rose by $95,874 to a new high of $1,795,980.67 -- one-fifth of all his sales.

"OFFICE OF TECHNICAL SERVICES sales of publications through its revolving fund rose by one-quarter to reach $810,368 -- or 45 percent as much as was sold through the Superintendent of Documents.

"Congratulations to you and your staffs on their contribution to the new records. I hope you will pass on to all those concerned my appreciation for their part in these achievements. Publications are one of the principal media through which the Department serves its public, and sales are an important measure of our effectiveness."

5. A RESEARCH REPORT: "The Effect of Plant Population and Planting Pattern of Corn on Radiation Interception and Water Use", has recently been written by Mr. Augustine Yao and Dr. Robert H. Shaw of Iowa State University. This is a report covering the Weather Bureau-Iowa State University contract No. Cwb. 9783.

In the past the Office of Climatology has arranged for our cooperating Universities to supply sufficient copies of a report to permit distribution to all State and Area Climatologists. However, recent contracts have specified

that the Weather Bureau receive only a few copies, but with the understanding that we are to receive 75 reprints of any portion of the report which the cooperator may see fit to publish.

As a consequence, Dr. Shaw has prepared only a modest number of copies of his report on Cwb 9783, but has informed us that he will have about 20 copies available for those who are sufficiently interested to ask him for a copy. His address is:

Dr. Robert H. Shaw
Department of Agronomy
Iowa State University
Ames, Iowa

A variety of plants per acre and of spacing was used in this study. The authors' summary of the report follows:

"Total evapotranspiration for the season (May 31-Sept. 20) ranged from 13.2 inches on the 21-inch row spacing with a population of 14,000 plants per acre, to 17.4 inches on the 42-inch E-W row spacing, with a population of 28,000 plants per acre. For the same population the higher the ratio of the net radiation at the ground to that above the crop, the higher was the evapotranspiration. The efficiency of water use ranged from 10.2 bushels per inch of evapotranspiration on the 21-inch spacing with 28,000 plants per acre to only 7.4 bushels per inch with 14,000 plants on a 42-inch row spacing with rows running E-W. More corn was grown and less evapotranspiration occurred with 28,000 plants using a 21-inch row spacing than with 14,000 plants using a 42-inch row spacing.

"The one year's data indicated it may be possible to get a greater efficiency of water use by decreasing the common 42-inch row spacing. However, it should be remembered these results apply to only one year's data under irrigated conditions."

6. SUPPLIES FOR THERMO-FAX MICROFILM READER-PRINTER: The Regional Administrative Offices have agreed to stock supplies for the Reader-Printers, thereby taking advantage of lower prices for bulk purchases. State Climatologists should obtain supplies by means of a Stores Requisition forwarded to the RAO.

7. PUBLICATIONS BY WEATHER BUREAU AUTHORS: Attention is invited to a new section in the Monthly Weather Review under the above heading. In it are listed published papers by Weather Bureau authors. As is the case with other publications in the Central Office Library, items listed may be obtained on loan from the Library.

8. CATALOGUE OF METEOROLOGICAL SATELLITE DATA - TIROS I TELEVISION CLOUD PHOTOGRAPHY: This catalogue, recently published as Key to Meteorological Records Documentation No. 5.31, should have carried the note that it is for sale by the Superintendent of Documents at a price of $0.70 each. Please indicate this on your file copy of this publication.

9. ARTICLES FOR THE WEEKLY WEATHER AND CROP BULLETIN, NATIONAL SUMMARY: A number of excellent articles by state climatologists have been printed in the

Weekly Weather and Crop Bulletin, National Summary. Material from this publication is frequently republished or quoted in other sources.

State Climatologists are encouraged to submit material for this publication. A wide choice of subject matter is possible. The subject and approach may be of your own choosing, so long as they pertain to some aspect of the weather effect on agriculture, business or commerce. Articles of from a few hundred to two thousand or so words can be used. The maximum length, including figures, would be enough to reproduce on pages 7 and 8 of the Bulletin. However, shorter items can very often be used to advantage. The text, tables, charts, etc., can be furnished in rough manuscript form, and they should be submitted through the Area Climatologist for his preliminary review. Short items which are of current interest because of some unusual weather situation can usually be processed to appear while they are still timely.

10. STUDENT TRAINEE PROGRAM: The following is the program outlined for a student trainee by the Oregon State Climatologist. This outline provides for a well rounded summer training program, without unduly emphasizing any one facet of climatological operations.

Summer programs will, of course, have to be adapted from case to case. They depend a great deal on the student's prior education. The most important point is that the student trainee is not an extra helper for the office, but an apprentice whose enthusiasm we want to arouse for a climatological career in the Weather Bureau.

TRAINING PROGRAM AT STATE CLIMATOLOGIST'S OFFICE, PORTLAND, OREGON

This program is planned on the basis that a trainee will remain at this station for the full summer of approximately 10 weeks. The types of activities and approximate percent of time alloted for each are:

(1) Formal study of text books, papers and other professional literature	25%
(2) Field experience (one week's travel with Hydroclimatic Field Aide)	10%
(3) Assist in research or cooperative professional studies	40%
(4) Assist in routine professional work	10%
(5) Assist in routine station duties	15%

The specific job or type of job assignments associated with each of the above categories is described briefly in the following paragraphs:

A. Formal Study Assignments: (Reading in full the following):
   (a) "Physical Climatology" - Landsberg
   (b) "Climate Near the Ground" - Geiger
   (c) "Compendium of Meteorology", chapters on Radiation, Cloud Physics, General Circulation and Climatology.
   (d) "Climatic Change" - Shapley
   (e) Climatological Service Memorandums, Monthly Weather Review, and selected professional papers that are most applicable

to the trainee's professional work assignments while on duty here.

Two hours per day are formally set aside for this work, thus providing 25% of the time be utilized for it.

B. Field Experience: One full week is alloted for this activity, making 10% of time spent in this activity if trainee completes 10 weeks. Trainee accompanies the Hydroclimatic Field Aide during the week used for recharging the storage gages. In addition to recharging 2-3 storage gages, at least one complete Class A evaporation station is fully inspected as are at least 2 or 3 full cooperative stations, a few recording rain gages, if possible a soil temperature and solar radiation and a first-order Weather Bureau Airport Station. In addition, the trainee is given a very comprehensive tour of the Portland River Forecast Center and, if time permits, a half day tour at the Portland WBAS and a trip to the Troutdale Airport automatic weather station.

C. Research and Cooperative Professional Studies: Between 3 and 4 hours per day are spent on the average in this work. Rather than completing one assignment, or as nearly so as possible, during one trainee's tour of duty a certain amount of time is spent on each, to provide a greater variety of experience. Some of the projects in progress to which trainees are assigned include:

(a) Snow Climate of Oregon: This includes the tabulation, summarization and computation of means and standard deviation of a number of snowfall, snow depth and threshold date figures for each of a selected number of stations.
(b) Determination of Potential Evapotranspiration Normals for a selected number of representative stations.
(c) Determination of required temperature and precipitation means and standard deviations for the Soil Conservation Service county soil survey reports.
(d) An areal study in "silver thaw" (ice storm) probabilities.
(e) Participation in the preparation of Substation Climatological Summaries for stations for which none have previously been issued, or in the revision of those where there is need for it.
(f) Maintain current files and work up those of an historical nature for severe storms that have occurred in the State.

D. Routine Professional Work: The fullest possible opportunity is given the trainee to participate in this work for which the following activities are a representative sample:

(a) Preparation of the Weekly Weather and Crop Reports.
(b) Collection of data and preparation of Monthly Storm Report.
(c) Preparation of the narrative account on storms or unusual weather for the Oregon Climatological Data.
(d) Reading technical papers received here.
(e) Conferring with personnel from other Federal or State agencies, including those with various climatological problems.

E. Routine Station Duties: Most of these duties are assigned to the trainee during his tour of duty here. An average of probably 30-45 minutes per day is spent in this work. The handling of incoming telephone calls is taken over by him only for brief periods at a time, mostly for familiarization with the type of service we are required to render.

(a) Takes the daily climatological observation.
(b) Maintains the recording rain gage and thermograph and works up all graphic records from them.
(c) Responsible for preparation of the original of form 1001-C.
(d) Filing of climatological records and publications regularly received here.
(e) Given occasional brief periods of handling incoming telephone calls.
(f) When convenient and suitable is assigned to handling some office visitors.

11. DECENNIAL CENSUS OF THE U. S. CLIMATE: Work is now underway on the first decennial census publication. It will be a part of the Climatography of the U. S. series and will be called "Decennial Census of U. S. Climate - Monthly Normals of Temperature, Precipitation and Degree Days". The United States will be covered by 44 issues. Each issue will include a short explanation and two tables. Table 1 will present monthly and annual normals for first order stations for the 1931-1960 period. Table 2 will repeat the normals for precipitation and mean temperature for first order stations and add those for substations. It will be arranged by subdivisions and will also carry the division normals.

The new normals will become effective on January 1, 1962, and the publication should be available and distributed to all field offices before that time.

12. PUBLICATION OF SOIL MOISTURE IN CD: This year was the first in which soil moisture data were published in the annual issue of Climatological Data. We will be glad to have comments on the usefulness of these tables and suggestions for their improvement. Data were published from 52 stations in 8 states (Illinois, Indiana, Iowa, Kansas, Minnesota, Montana, Ohio and Texas). Precipitation totals for the intervals between soil moisture measurements were included for most reporting points. These are almost essential for evaluating soil moisture changes. The inclusion of these important data should be encouraged whenever possible.

We should perhaps point out that soil moisture data are supplied by non-WB cooperators who are fully responsible for the measurements and who supply us with the data in final form. The WB has publicized the preferred ground cover and depths of sampling as suggested by a group of soil scientists. However, this should not be considered a WB program for which we are officially responsible.

13. ACTIVITY REPORTS: In any organization concerned with a multiplicity of detailed instructions communications between the several units involved becomes a matter of extreme importance. This is particularly true between the Office of Climatology and the several Area and State Climatologist's offices.

In fact, this is one of the basic purposes of the CSM; unfortunately, the CSM is largely a one direction medium and a continous feed back in the form of activity reports is quite desirable.

We have no desire to establish fixed reporting times; however, we would like to be certain that non-periodic reports are forwarded to the CO promptly when information pertinent to the climatological program becomes available. Only through a steady flow of information of this type can the Director and his staff be informed sufficiently to carry out an effective field program.

14. HURRICANES CARLA AND ESTHER: Hurricane Carla, a tremendously destructive and highly dangerous storm is vividly described in Topics for September 1961. As soon as evidence of Carla's unusual strength and size became apparent, action was started to obtain an early summary for the next issue of the Weekly Weather and Crop Bulletin.

An excellent story resulted in the September 18 issue. This summary was made possible only by a great deal of prompt work on the part of many people, including first order station personnel, State and Area Climatologists, District Forecast Centers, and Office of Climatology employees.

A week later a similarly fine story on Hurricane Esther (one of the first hurricanes ever discovered by a satellite) was carried in the September 25 issue of the crop bulletin.

We are well pleased with the early publication of these preliminary summaries and all concerned are commended for their efforts which made these stories possible.

15. SUBSTATION SUMMARIES: One of the recent accomplishments in the Substation Summary program was in Wisconsin, where the State Climatologist interested the Wisconsin Crop Reporting Service in climatological substation summaries with the result that 66 such summaries were produced for Wisconsin in less than three years. State Climatologists in those states where only a few summaries have been printed might consider contacting representatives of Statistical Reporting Service of the U.S.D.A. to see if they would be interested in this program. (At last count the total substation summaries printed was 548.)

16. COUNTY CLIMATIC SUMMARIES: State Climatologists are asked to include, in the next activity report, the total number of county climatic summaries that have been completed for the SCS Soil Survey Reports.

17. SUMMARY OF HOURLY OBSERVATIONS: The ten-year "Summary of Hourly Observations" program is getting underway and a number of stations, all of which are international airports, have been selected as the first group to be processed. Other groups of stations will be selected as the program progresses.

18. PUBLICATIONS FURNISHED STATE AND AREA CLIMATOLOGISTS AND WRPCs SINCE CSM 89: Soils Memorandum SCS-23 "Climatological Services Available to States with Special Reference to the Section on Climate for Standard Soil

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Survey Reports".

"Heating Degree Days at Columbia S. Car. Compared to Surrounding Areas" by John C. Purvis.

"Risks of Freezing Temperatures - Spring and Fall in Indiana." Research Bulletin No. 721, Purdue University.

"Late Spring and Early Fall Freezes" by Kauffman and Butler.

H. E. Landsberg

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