WEATHER BUREAU TOPICS

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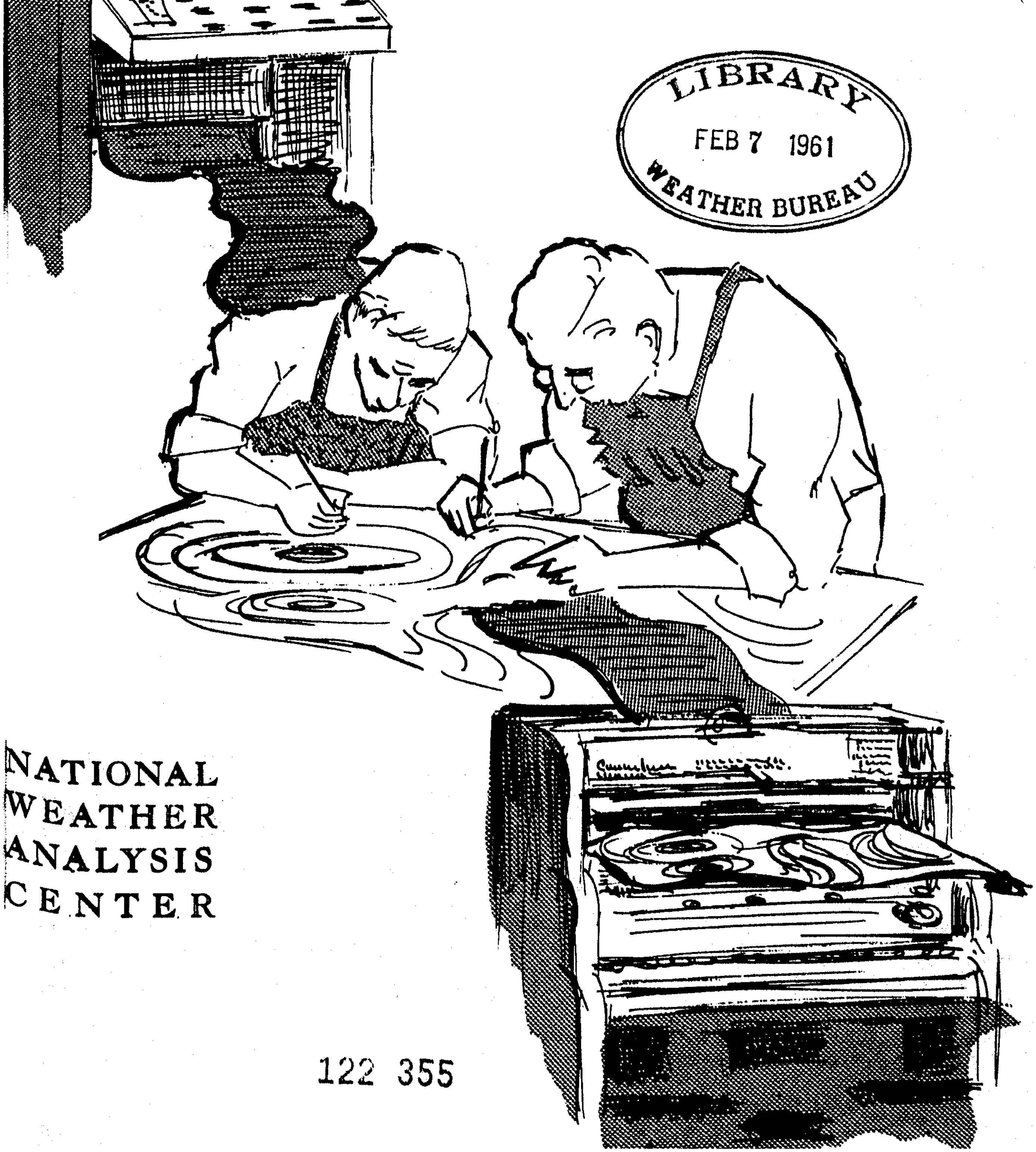


NATIONAL WEATHER ANALYSIS CENTER

National Oceanic and Atmospheric Administration
Weather Bureau Topics and Personnel

Editorial

Program Priorities

In the May 1960 issue of TOPICS, the Central Office issued information on program changes under the 1961 budget. From time to time in other articles in TOPICS, this Office has tried to keep the Weather Bureau field services informed of the principal features in our plans for service and research programs and has described the several steps involved in the budgetary and planning processes each year.

Currently, questions of priorities of new programs are under discussion by top staff. In another article in the present issue of TOPICS, there is a summary of the work of the Office of Planning under the Deputy Chief of Bureau and Mr. J.C. Thompson. The Office of Planning is always open to suggestions and recommendations regarding programs. Regular procedures are in effect for inviting expression of views by heads of the respective technical services and research divisions, the Regional Administrative Offices, and other units most directly concerned with plans and program operations.

Probably it occurs to many meteorologists, not only in the Weather Bureau but in other organizations, to wonder why new programs are undertaken when there are so many deficiencies in facilities and staffs to maintain and improve services already in existence. There is scarcely an office or activity that could not do a better job and offer more public service if it had newer facilities and more staff. Many examples could be given. Many of our Weather Bureau airport stations feel the urgent need for additions to staff. The agricultural and marine meteorological services of the Weather Bureau, the first fields to receive special attention after the Bureau was established in 1890, have long been in need of funds to meet new requirements and new possibilities in applied meteorology of benefit to the farmer and the mariner. With the great increase in field installations with radar and other electronic devices, there has come the need for a larger number of technicians to install and maintain this equipment and at present there is a serious shortage of electronics technicians in the Bureau. The Regional Offices do not have sufficient staff to carry on even a minimum schedule of visits to field stations. The list of deficiencies could be multiplied almost without end.

In face of these needs, why does the Bureau undertake new programs in research and place emphasis on the meteorological aspects of satellites like the TIROS and NIMBUS series? The reasons are to be found in policies and practices which, for the most part, are circumstances beyond the administrative scope of the Weather Bureau. In presenting its programs each year and recommending the necessary budgets, the Bureau seeks to support items in order of priorities which appear to represent the greatest good to the greatest number. While such priorities are necessarily very subjective, it is possible to arrive at reasonably good overall priorities by the process of group discussion and evaluation of the several interests usually involved in each item.

However, one of the circumstances confronting every government agency is that old programs seldom have the appeal that new programs have. Year after year, the Bureau has recommended increases to correct major deficiencies such as those illustrated in the aforementioned examples, but at one stage or another in the budgetary process, they have been lost because of "newer and more urgent requirements in other fields."

In most cases of this kind, funds appropriated for new programs do not represent amounts that might have been used to correct deficiencies in old programs. In most cases, appropriations are earmarked to an extent which prevents their use for items that have been lost at one stage or another in the sequence of hearings and decisions subsequent to the Bureau's original budget recommendations. Moreover, the Bureau must be among the leaders in research and new developments, such as meteorological satellites, in order to avoid the worse consequences that it will not have direct access to vital new sources of atmospheric information and come to be regarded as a backward and unprogressive government agency, a reputation that is often a major deterrent to congressional approval of our requests for funds to strengthen established services and to develop new services.

We believe it is helpful if meteorologists in general are aware of the forces inside the Bureau and outside that usually determine the final decisions as regards programs and priorities. Information on these subjects will be published in TOPICS from time to time.

--F.W.R.

Topigrams

Washington, D.C.
January, 1961

TIROS II has returned to the Northern Hemisphere after three weeks in the Southern Hemisphere. Since the satellite was launched on November 23, 1960, more than 10,000 cloud photographs have been received at the Meteorological Satellite Laboratory in Suitland, Maryland. During TIROS' stay in the south, nephanalyses of the southern oceans, particularly to the south of Australia and New Zealand, were sent to the International Antarctic Analysis Center in Melbourne to aid them in support of the Antarctic resupply mission.

The radiation experiments in TIROS II are reported to be operating successfully. From January 7 to January 19, 1961, special upper-air radiation sensors are being flown on weather balloons released from 13 Weather Bureau stations for comparison with TIROS II radiation data.

In his Budget Message to Congress on January 16, the President recommended appropriations of $69,865,000 for the Weather Bureau in Fiscal Year 1962. If approved by Congress, this would be an increase of $8,446,000 in new obligational authority over the Fiscal Year 1961 level and would provide for 395 additional positions. The requested appropriations include $55,615,000 for Salaries and Expenses, $9,000,000 for Research and Development, and $5,250,000 for Establishment of Meteorological Facilities.

With the recent activation of WSR-57 radars at Tampa and New Orleans, there are now 18 of these long range radars in operation. Thirteen more radars of this type remain to be installed and commissioned under the present program of expansion.

R.H. Simpson has been named Deputy Director of Meteorological Research (Severe Storms). This new position was created to handle Central Office functions associated with the National Hurricane Research Project, the National Severe Storms Project, and research aircraft operations supporting both of these projects and similar field research programs.

The research aircraft program, formerly attached to the NHRP, has been established as a separate organizational unit known as the Research Flight Facility. This facility, under the direction of Carl Reber, will continue to maintain its base of operations at Miami, Florida.

Three members of the Office of Climatology, Dr. Landsberg, H.C.S. Thom, and H.B. Harshbarger, participated in the December meetings of the Commission for Climatology CCl-III in London, England. The Commission approved a new Guide to Climatological Practices which will be most helpful to the newer climatological services.

Briefs from the CO Staff Conferences

The Chief of Bureau discussed the recent activities of the Interdepartmental Committee for Atmospheric Sciences of the Federal Council for Science and Technology. He commented particularly on the very excellent briefings given the Committee by Bureau personnel during the Committee's recent visit to the Weather Bureau facilities at Suitland. The Committee was impressed by the climatological program of the Bureau and suggested that more university work in climatological research should be encouraged. The Committee was also impressed by the excellent interagency coordination accomplished in the Satellite Program through the Joint Meteorological Satellite Advisory Committee.

In connection with a discussion of the United-TWA aircraft collision over New York, the Chief of Bureau suggested that a study should be made of the adequacy of weather input into air traffic control.

The National Severe Storms Project plans a large field operation for the coming severe storm season, with Oklahoma City as the base of operations. More data-gathering equipment and facilities are available than ever before. Present plans are to apply all these facilities to research of a limited segment of squall lines as they pass through the area. The FAA is providing staff to handle vectoring of the aircraft into the planned flight pattern.

Mr. Kvam, Chief of Administrative Operations, made a comprehensive report of the activities of the General Accounting Office audit team. The audit began more than a year ago and should be completed soon. The team has made ten written reports to the Bureau, either questioning procedures or suggesting better procedures. One or two additional questioning reports are expected.

It was suggested that other agencies of government should be informed of meteorological plans for using satellite data--particularly the Department of State because of the international aspects. The Office of International Meteorological Plans was requested to investigate the possibility of briefing interested State officials on Bureau plans.

An informal summary of priority programs, prepared by the Office of Planning, was reviewed and approved. This summary, prepared from individual suggestions made by Chiefs of Divisions and other Bureau officials, is intended to provide general guidance on programs which would contribute the most to the Bureau's performance as the national meteorological service.

There was considerable discussion as to the best approach to Inauguration Day forecasts. The pros and cons were fully considered. It was the consensus of the group that some information should be released based on extended prediction methods and climatological probabilities.

The Deputy Chief of Bureau presented two questions for thought:

1. What is the Bureau doing that is obsolete?
2. How do we get rid of obsolete programs?

National Weather Analysis Center

The National Weather Analysis Center was established as the obvious solution to problems of duplication and differing analyses in maps prepared independently in different localities and also as a means of using experienced meteorologists more efficiently during World War II. The advantages of central analysis were quickly demonstrated, and NAWAC was continued after the war as a joint project of the Weather Bureau, Navy, and Air Force.

Recognition of the influence of broad-scale hemispheric flow patterns on the behavior of individual weather systems was one of the important concepts behind the creation of the Analysis Center. A centralized facility can efficiently collect and process data from all over the world, reducing duplication of effort in the field and communications overloading.

Every 24 hours NAWAC receives over 30,000 weather reports from all over the Northern Hemisphere--reports from Weather Bureau stations, other nations, ships at sea, and aircraft in flight. These reports come to the Communications Section on more than 20 teletypewriters and on wire and radio circuits connected with all parts of the Northern Hemisphere. As they are received, the reports are passed through a window to the Plotting Section and placed in one of many different slots, according to the nature of the data or its area of origin.

In the plotting room, more than 20 men and women are at work. Hemispheric surface data are plotted on segments of maps, each man plotting the data for a particular area. When the various pieces are finished, they are put together like a giant jigsaw puzzle. Other maps may be plotted by one man, or by a group working together over a single map.

The maps then go to the Analysis Section, where teams of analysts work at light tables drawing in isobars to permit the location, identification, and characterization of the pressure fields and the frontal systems.

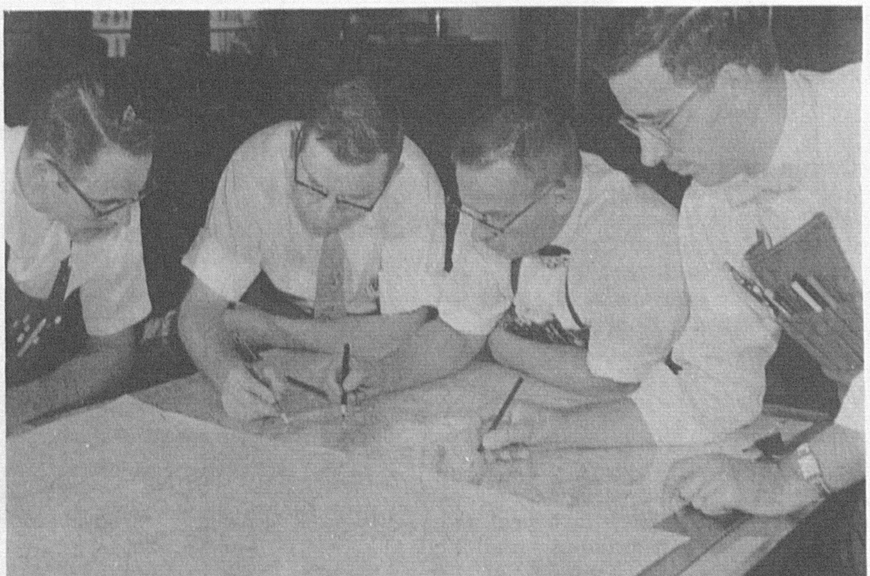
In a smaller room, the Prognostic Section uses the analyzed maps to prepare prognostic charts.

The products return to the Communications Section, where they are sent, via the National Weather Facsimile Network, to more than 700 users. In less than three hours from the time a weather man at the most distant point on earth has sent in his report, a picture of a completely plotted and analyzed weather map is received by facsimile at several hundred locations in the United States and Southern Canada. In addition, the data must be coded and sent by teletypewriter to stations without facsimile receivers. The work goes on 24 hours a day, seven days a week, and has not stopped since it first began in 1942.

NAWAC prepares and transmits hundreds of weather maps every 24 hours. All hemispheric surface data, 850-, 700-, 500-, 300-, 200-, and 100-mb. upper-air analyses for the continental United States, 18-, 30-, and 42-hour prognostic charts, 18- and 30-hour cloud and precipitation forecasts, 24-hour temperature change forecasts, and quantitative precipitation forecasts come from NAWAC.

Hemispheric upper-air analysis is now performed by Joint Numerical Weather Prediction, using the computer and the new automatic curve plotter. As more and more charts are prepared by automatic methods, NAWAC can increase its output of more specialized analyses and forecasts, such as the quantitative precipitation forecasts, which are now prepared twice daily. Another example of the interrelationship between NAWAC and JNWP is NAWAC's High-Altitude Forecast Section, which uses upper-air guidance forecast material from JNWP to prepare operational forecasts for jet aircraft.

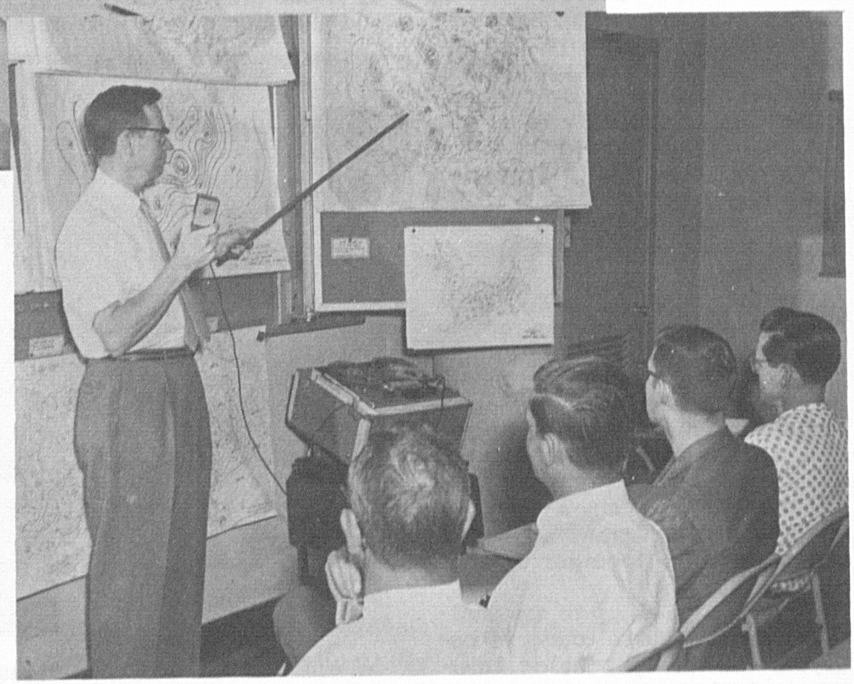
In addition to analysis and prognostic operations, the Analysis Center acts as consultant and coordinator to all units, including the Navy and Air Force, on rapidly developing dangerous storms. The Center trains weather personnel on special assignments to the Washington area and performs special weather services, usually global in scope, not normally provided by field units.



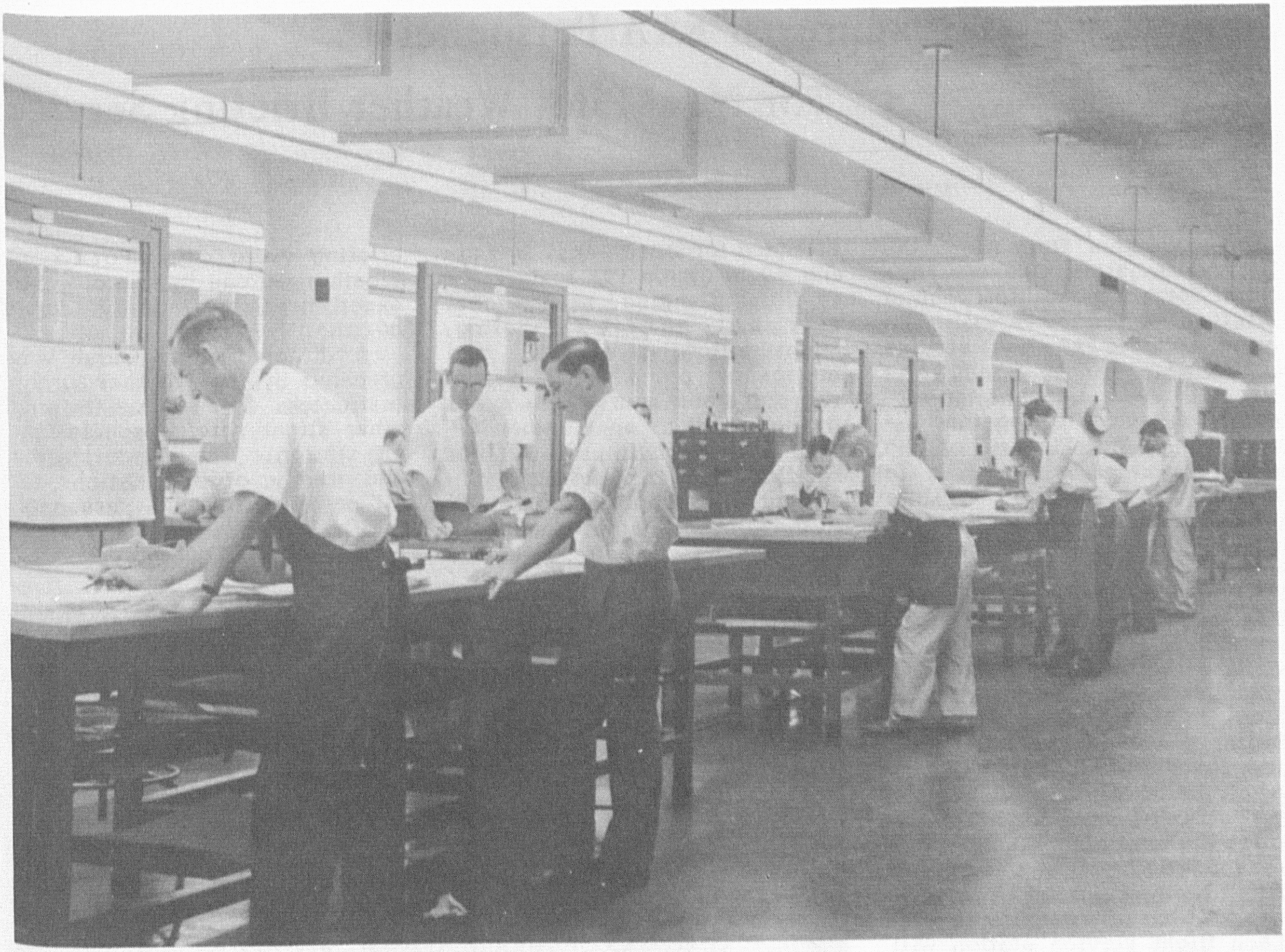
NAWAC analysts construct an upper-air chart, using a computer guidance prognosis as a reference.

Left, Frank Burnett, Associate Director of NMC for Weather Analysis and Forecasting (right), checks revisions in the weather facsimile schedule with Harry Miller, Chief Communicator, and Peggy Carroll, clerk.

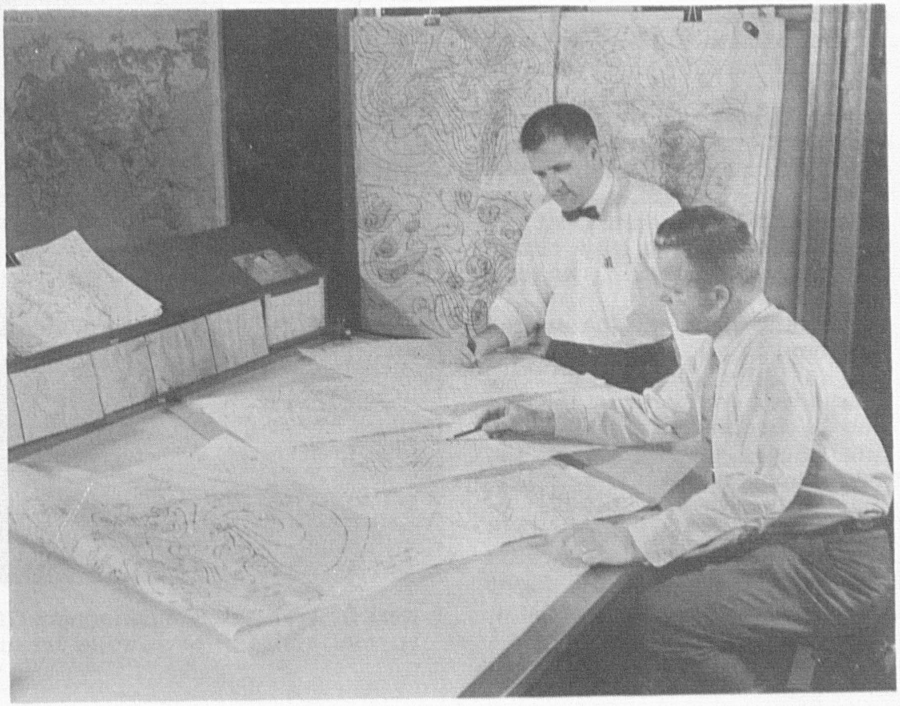
Center, surface analyst Bernard Dubofsky constructs NAWAC synoptic weather map as Commander James Cox, USN (left), checks latest ship reports along eastern seaboard. Eugene Brown, NAWAC Quality Control Officer (right).



Right, William Chapman, Principal Meteorologist, conducts a daily map discussion. Past, current, and future predictions are discussed and recorded for the benefit of forecasters on the evening and night shifts.



Above, the analysis section during the period of simultaneous construction of the 850-, 700-, 500-, and 300-mb. upper-air analyses.



Right, NAWAC forecasters Alan Sanderson (left) and Charles Vore (right) relate trend patterns of forecast errors to latest numerical 500-mb. prognosis chart.

Bureau Assists Training of FAA Personnel For New Pilot Weather Briefing Service

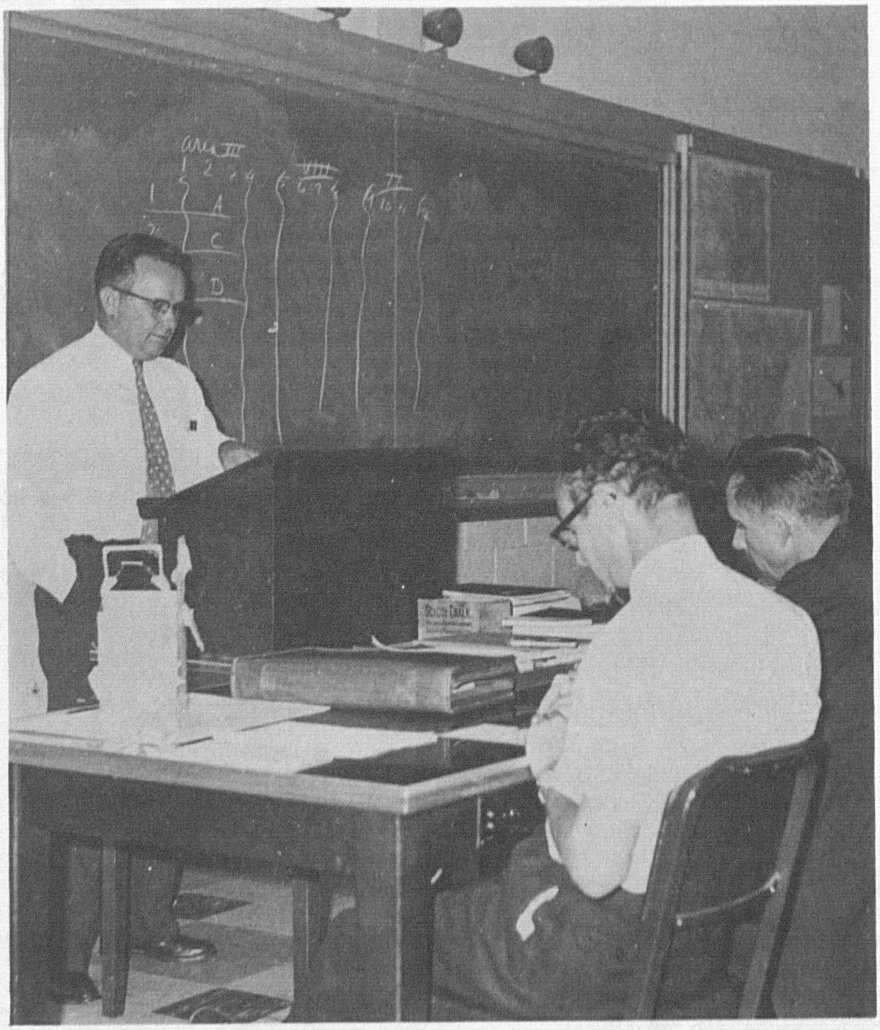
The Weather Bureau and the Federal Aviation Agency have jointly organized a pilot weather briefing service which will make greater use of FAA flight service stations to handle preflight briefings and to answer air-ground requests for weather information. This is one of the most important steps taken in recent years to provide pilots with the aviation weather support they need for safe flight operations.

Under the expanded program, FAA flight service station personnel will continue to handle routine requests for aviation weather information. In addition, in those cases where available weather forecasts do not cover specific terminals or a particular route, FAA station personnel will adapt for the pilot the available Weather Bureau information to meet his flight requirement. FAA personnel will not originate forecasts. Each flight service station will be linked to a Weather Bureau airport station and/or FAWS by interphone or teletypewriter communication.

Approximately 330 FAA flight service stations and possibly some of the 80 FAA combined station/towers will provide flight and weather briefings. With about 240 Weather Bureau airport stations in operation, this will almost triple the number of offices where pilots may obtain personalized preflight weather briefings.

To train flight service station personnel in pilot weather briefing, a Pilot Weather Briefing Course was designed by the Bureau in cooperation with the FAA. This course was given at the FAA School in Oklahoma City, from July to November 1960. About 450 flight service specialists attended, including one student from each of the flight service stations and combined station/towers. Each student attended for four weeks, spending 40 hours on FAA instruction in flight planning, navigational aids, aeronautical briefing, flight following service, and emergency procedures. Fifty-two classroom hours were spent by each student on Weather Bureau instruction in pilot weather briefing, including basic meteorological concepts as contained in the Pilot's Weather Handbook. All classes in pilot weather briefing were conducted by Weather Bureau meteorologists experienced in aviation forecasting.

A directed study course was prepared by the Weather Bureau instructors for use in training other flight service specialists on station. The administering and grading of examinations for all participating FAA personnel will be performed by the Weather Bureau at FAWS centers.



Neil B. Ward, WBAS Oklahoma City, instructs FAA flight service specialists in pilot weather briefing.

Planning Chief

Jack C. Thompson

When the Office of Planning was established in late 1959, Jack C. Thompson was selected to lead this very important activity. His wide experience in forecasting, research, and planning has made him familiar with all facets of the Bureau's operations.

Mr. Thompson has been a weatherman for 31 years. Between 1929 and 1950, he served as observer, fire-weather observer, fruit-frost forecaster, district forecaster, and research forecaster at various stations in California.

From 1950 to 1953, Mr. Thompson was a research meteorologist in the Central Office, where he supervised a study of aviation terminal weather forecasting. Upon the completion of this study, Mr. Thompson became a traveling research forecaster, visiting field stations to assist with their scientific research.

In 1953, Mr. Thompson returned to California as MIC at Los Angeles. He came back to Washington in 1955 to serve in the Office of Meteorological Research. As special assistant for forecasting research, he helped in planning the nature and scope of Weather Bureau research programs.

Mr. Thompson attended Sacramento Junior College and the

(Continued on page 13)

New Bureau Office Coordinates Long-Range Technical Planning

The Office of Planning was established in late 1959 as a staff function of the Office of the Chief and Deputy Chief.

The purpose of the Office of Planning is to stimulate orderly technical planning and to coordinate the development of specific technical plans. It does not engage in day-to-day or month-to-month planning for routine operations. Its effort is concentrated on programs to be carried out a year or more in the future.

To keep meteorological programs abreast of developments in satellites, communications, and related technologies, the Office of Planning must be constantly aware of technical developments. Methods of weather service operation must be revised in accordance with changes in these allied fields.

Changes in operations using weather information, such as aviation, agriculture, and industry, create new weather information requirements. These changes must be taken into account by the Office of Planning. New types of meteorological observations, revised forecasting procedures, or improved weather communications may be required.

A basic concept of the Office is that the most effective planning originates with those who are experts in, and are directly concerned with, the fundamental activities of the Bureau. In line with this concept, long-range plans are developed by a permanent Technical Planning Group and a series of temporary Planning Panels. The work of these groups is reviewed by a Plans Review Board.

The Technical Planning Group deals with Bureau-wide program planning. It prepares and coordinates specific fiscal-year plans to carry out basic activities of the Bureau. Representatives of each of the scientific and operating offices or divisions of the Bureau and of the Budget and Management Division are included in the group.

To consider problems of narrower scope, Planning Panels are created. Each Planning Panel includes technical experts in the particular field, a representative of the Office of Planning, and a Secretary. The Panel is provided with a specific set of "terms of reference" prepared by the Planning Office. Its work is completed upon submission to the Office of Planning of a report describing the problem area considered and containing a specific set of recommendations for Bureau action.

The Planning Office transmits reports from the Planning Panels or the Technical Planning Group to the Chief of Bureau for referral to the Plans Review Board. When the recommendations of this board have been made and approved by the Chief, the operating divisions or offices are responsible for carrying them out. Upon approval of a planning study, the Planning Office furnishes a copy of the report to Chief District Meteorologists, Regional Administrative Officers, and other field officials for their information and comment.

One panel, on Observations over Sparse Data Areas, has completed its assignment. Another panel has prepared a preliminary report on the Operational Use of Meteorological Satellite Data. Through support arranged by the Office of Meteorological Research, a Prospectus of Meteorological Operations has been prepared by Dr. John Bellamy. A panel on field station libraries and one on dissemination of public weather information are now in operation. A panel on meteorological radar is being established, and one is soon to consider meteorological communications.

Results of Practice Forecasting Announced

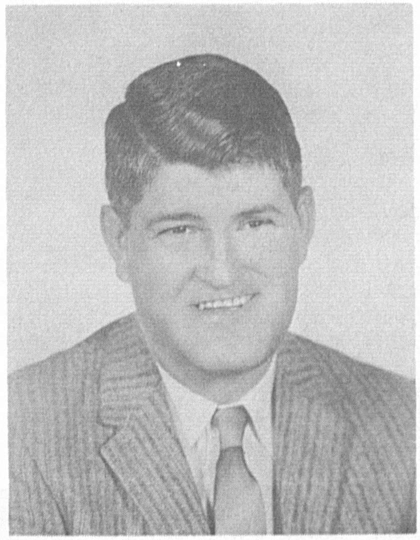
The Practice Forecast Program was started in 1955 as a voluntary program to detect forecasting talent. A secondary objective was the development of forecasting skill through competition in a planned program. Another aim was to provide interested field employees with an opportunity to demonstrate ability. In five years of operation, these objectives have been accomplished to a substantial degree.

The growing importance of the program is shown by the increased enrollment, which has more than tripled through the five years, and by the increased use of results. The 1961 program announcement letter states, "By the time the results of the 1960 program become available, promotions and reassignments to initial forecasting positions of GS-11 and higher grades will be made in most cases from a list of candidates having a record in the Practice Forecast Program in addition to the other qualifications for the professional grade."

The top four participants in each year from 1955 through 1959 are shown on this and the opposite page. These employees had the best records among the many who are to be congratulated for their outstanding work.

We wish to commend all those who finished in the first decile during the past five years.

Following are the participants who finished in the first decile in 1958 and 1959:



J.H. Eggleston
El Paso, Texas

2 - 1955
2 - 1956
1 - 1957

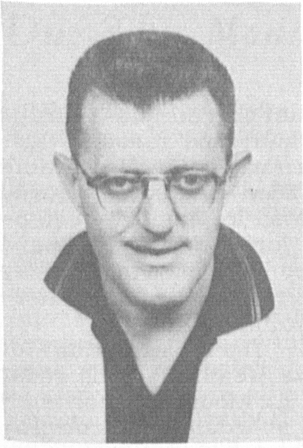
1958

1.	Gilbert, L.R.	Columbus, Ga.
2.	Hicks, J.R.	Lake Charles
3.	Groper, H.S.	Philadelphia
4.	Foster, R.J.	Toledo
5.	Van Den Brink, C.	Des Moines
6.	Whipple, J.H.	Lewiston
7.	Dillon, J.P.	LaGuardia Field
8.	Overgard, G.B.	Moline
9.	Carr, R.J.	LaGuardia Field
10.	Bowers, T.J.	Columbus, Ohio
11.	Rauch, R.M.	Bismarck
12.	Astell, K.C.	Minneapolis
13.	Reynders, D.E.	Raleigh
14.	Blandino, G.	Milwaukee
15.	Larson, L.B.	Walla Walla
16.	Albrethsen, H.	Chicago (WBO)
17.	Stone, J.M.	Minneapolis
18.	Quinlan, J.H.	Wilmington
19.	Walker, E.T.	Nashville
20.	Denney, G.	Amarillo
21.	Popadines, A.	Indianapolis
22.	Blackburn, T.	Toledo
23.	Rash, J.L.	Little Rock
24.	Sherry, J.P.	Boise
25.	Pedersen, R.A.	Des Moines
26.	Costello, J.L.	Allentown

1959

1.	Watson, C.T.	Knoxville
2.	Hays, C.R.	Shreveport
3.	Hicks, J.R.	Lake Charles
4.	Eckert, W.O.	Goodland
5.	Dillon J.P.	Jamaica, N.Y.
6.	Stone, J.M.	Minneapolis
7.	Rauch, R. M.	Bismarck
8.	Overgard, G.B.	Moline
9.	Blackburn, T.	Richmond
10.	Beall, G.T.	Minneapolis
11.	Sherry, J.P.	Boise
12.	Rash, J.L.	Little Rock
13.	Ezell, W.B.	Burlington
14.	Lefebvre, M.R.	Minneapolis
15.	Cobb, W.K.	Huntsville
16.	Rodgers, W.L.	Greenville
17.	Astell, K.C.	Minneapolis
18.	Walker, E.T.	Nashville
19.	Huber, A.M.	Omaha
20.	Gilmet, W.	Alpena
21.	Belanger, E.E.	Green Bay
22.	Costello, J.L.	Allentown
23.	Turner, J.E.	Cleveland

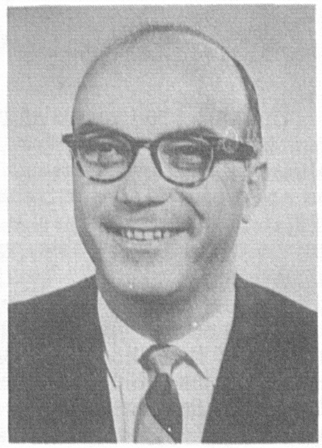
(The names of participants finishing in the first decile for 1955, 1956, and 1957 have been published in previous TOPICS issues.)



E.L. Eaton
El Paso, Texas
1 - 1955, 3 - 1956

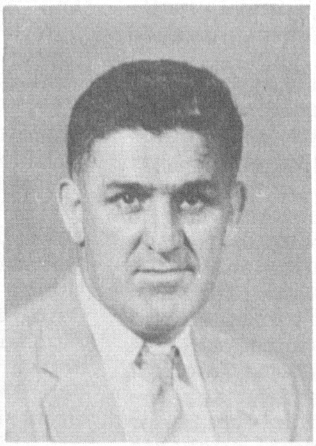
H.S. Groper
Philadelphia, Pa.
3 - 1958

J.R. Hicks
Lake Charles, La.
2 - 1958, 3 - 1959



R.J. Foster
Toledo, Ohio
2 - 1957, 4 - 1958

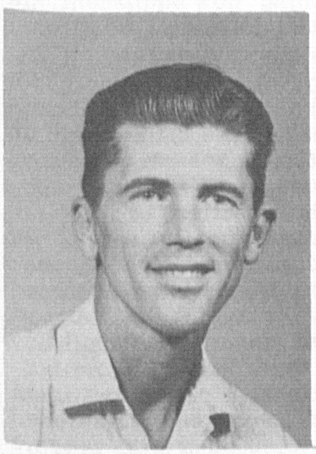
R.F. Browne
NAWAC, Suitland
3 - 1955



L.R. Gilbert
Columbus, Georgia
3 - 1957, 1 - 1958

H.C. Schaeter
Milwaukee, Wisconsin
4 - 1955, 1 - 1956

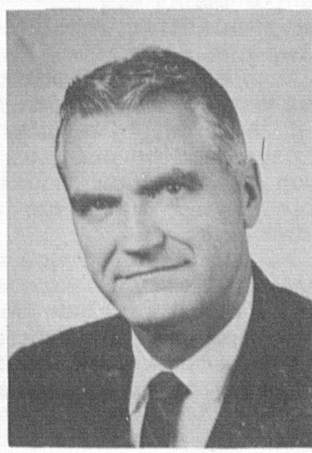
C. Van Den Brink
Des Moines, Iowa
4 - 1957



C.R. Hays
Shreveport, Louisiana
2 - 1959

W.O. Eckert
Goodland, Kansas
4 - 1959

C.T. Watson
Knoxville, Tennessee
1 - 1959



W.P. Hirschfeld
St. Cloud, Minnesota
4 - 1956

Status Report on New Programs for FY 1961

The May 1960 issue of TOPICS contained an itemization of our planning for new programs based on appropriations for fiscal year 1961. The following is a report on the status of these programs.

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a. Funds were provided to establish five Second-Order Stations. Those at Gooding, Idaho, Whitehall, Montana, and Douglas, Wyoming, have been set up, as has one at Sunbury, Pennsylvania, which replaces Selinsgrove in our original plan. Establishment of a Second-Order Station at Pulaski, Virginia, is scheduled for early in calendar year 1961.

b. Positions have been added to the complement of Weather Bureau Airport Stations at Wichita Falls, Texas, Spokane, Washington, Colorado Springs, Colorado, and Madison, Wisconsin, to partially offset the increased workload resulting from civilian-military joint-use aircraft operation. This exhausts funds provided for this program.

c. The Mississippi Delta Agricultural Weather Forecasting Service was extended to eleven parishes in northern Louisiana on August 1, 1960. The program required establishment of seven new agricultural weather reporting points, as well as communication facilities within the parishes involved.

d. The River Forecast Centers at Hartford, Connecticut, and Augusta, Georgia, were strengthened by one position each to bring their complements more in line with operating requirements.

e. Since the revision of climatic normals for First-Order Stations is to include data for calendar year 1960, progress in this area has been limited to planning. However, the program will become operational early in calendar year 1961.

f. The increased programs of F.Y. 1961, including those in Research and Development, required an increase in executive direction and administrative support. A total of 14 out of 17 new positions have been established thus far.

The new appropriation account for Research and Development contained an increase of $1,237,000, which has been programed in three major areas:

1. The first program was to provide for additional flying hours and meteorological instrumentation of the hurricane research aircraft. The planes flew in each hurricane this past summer and will be fully equipped and available for flight investigations in the Midwest tornado area in the spring.

2. Financial support has been given the Coordinated Aviation Weather Systems Development Project as planned.

3. A National Severe Storms Project has been established in Kansas City. Under the direction of Mr. Van Thullenar, the project will continue research into the causes of tornadoes and other severe local storms. A major part of the project's effort will be devoted to applying results to improved forecasts for aviation, with special emphasis on the study of clear air turbulence.

The Establishment of Meteorological Facilities appropriation totaled $5,250,000, to be available over a three-year period. Status of the various programs involved is as follows:

1. Upper-air

a. To obtain better exposure, relocation of the upper-air stations at Pittsburgh and Nashville is planned.

b. Bids are being processed to obtain 35 transponder adjuncts for upper-air stations.

c. A contract will be let within a short time to obtain 16 sets of upper-air shipboard equipment.

2. Radar

a. Due in part to the high installation cost for WSR-57's at New York and Chicago and the fact that complete settlement of hurricane research aircraft instrumentation contracts has not been completed, funds appropriated for auxiliary equipment at Air Defense Command radar sites have been temporarily placed in reserve pending determination of actual costs.

b. The installation of long range weather search radar on Point Six Mountain near Missoula is scheduled for completion in November 1961.

3. Surface Observations

a. & b. End of runway equipment for 53 airport runways and runway visual range computers for 105 airports are being procured. First deliveries are expected in the spring of 1961.

c. & d. Hygrothermometers for 70 airport runways and wind recorders for 81 locations are being purchased.

e. Specifications are being prepared for five automatic meteorological observing stations. Present plans are to locate them at St. Petersburg, Florida; Meigs Field (Chicago); Akron Municipal Airport, Ohio; Van Nuys, California; and Grantsburg, Wisconsin.

f. In the hydrologic area, working models of the isotope snow gage have not proven satisfactory, and funds planned for obtaining this equipment are being used to install additional radar beacon rain gages.

g. Funds intended for the purchase of 70 weather briefing displays are being held in reserve for the reason mentioned in 2a above.

4. Construction

a. A contract will be let during the spring for the construction of four modern housing units at Nome, Alaska, airport in conjunction with FAA building plans at that location.

5. A total of seven additional positions have been assigned RAO's 1, 2, 3, and 4 to provide engineering and technical support required to implement the EMF activities discussed above.

Service 'A' Change Due This Month

To meet the increasing demand for a more widespread and rapid dissemination of meteorological information, the present Service A teletypewriter system is being redesigned. A target date of January 15, 1961, has been established for placing into effect the new Service A system. Essentially this change consists of replacing the present 12 Service A area circuits, 8001 through 8012, with 15 area, 14 supplemental, and 1 high-speed circuit.

The 15 area circuits, 8021 through 8035, will cover the entire contiguous United States and will be used for the collection and dissemination of data. The 14 supplemental circuits, 8036 through 8049, will not be used for the collection of data but for dissemination only. Drops will be located only at the major aviation centers where additional data are required above those which can be received on one area circuit.

The high-speed circuit, 850 words per minute, is intended primarily to connect the five relay centers but will also be extended to six additional cities where the Weather Bureau has aviation forecast centers.

Private Telephone Use Could Speed Warnings

A Weather Bureau employee has suggested that private telephones might be used by small stations to reduce the time needed to issue vital warnings. Each employee could keep a list of storm warning recipients readily available at home. When the need arises for immediate distribution of warnings and only one man is on duty, he can phone the warning message to two meteorologists at home, asking that each one telephone the recipients for whom he is responsible. Savings of vital time might vary from 20 minutes to 1-1/2 hours.

New Facsimile Network Established; Speed of Transmission Doubled

On December 15, 1960, the Bureau's new National Weather Facsimile Network began transmitting weather maps at twice the speed of the circuit formerly in use. The new network is operated by the Weather Bureau, using circuits leased from Western Union.

Every 24 hours, over 100 weather analyses and forecast charts prepared at the National Meteorological Center are transmitted to more than 650 government, military, and commercial receiving stations in 330 cities in the contiguous United States and southern Canada.

About 200 Weather Bureau stations and 300 military installations receive the information. Other users include the Atomic Energy Commission, Forest Service, radio and TV stations, air lines, and public utilities. Extensions from the network are available to private users who obtain licenses from the Weather Bureau.

In addition to regular surface and upper-air Northern Hemisphere analyses and prognostic charts, the following maps are transmitted: five-day forecasts, 30-day outlooks, freezing level analyses, instantaneous quantitative precipitation forecasts, precipitable water analyses, rainfall and snow cover, high level significant weather, stability index analyses, temperature change forecasts, maximum and minimum temperatures, current weather conditions, and winds aloft analyses and forecasts.

Charts showing the distribution of radar echoes and areas of most likely severe thunderstorm activity are transmitted daily from the Weather Bureau at Kansas City.

Time has also been reserved in the 24-hour facsimile schedule for the transmission of cloud analyses based on photographs taken by TIROS II.

Several map scales are used to meet the varying needs for details and area coverage. In some cases, composite charts of two or more types are used for certain transmissions to increase usage of network time and to permit more timely transmission of certain charts.

A number of analyses and forecast charts are prepared solely by numerical methods, using the IBM-7090 computer and the new automatic weather plotter at the NMC. In order to distinguish these from analyses and prognoses prepared by synoptic meteorologists, the letters "NWP" are added following the letters "NMC" in the title of each chart prepared by numerical methods.

Weather Bureau Manual Chapter B-51, National Weather Facsimile Network, has been completely revised and should be consulted for more detailed information.

Jack C. Thompson (cont'd)

University of California, and graduated from U.C.L.A. in 1948, having received a Weather Bureau scholarship to complete his professional training in meteorology.

In 1955, Mr. Thompson was awarded a Department of Commerce Silver Medal for Meritorious Service for his "outstanding leadership and very valuable contributions to meteorological research and development."

Mr. Thompson was a National Councilor of the American Meteorological Society from 1955 to 1958 and Chairman of the District of Columbia Branch of the AMS in 1959-60. He is a member of the Washington Academy of Sciences, the American Geophysical Union, and Sigma Xi.

Many Fringe Benefits Increase Federal Employees' Real Income

(The following article is reprinted from "Visitor," a bulletin issued by the Ninth U.S. Civil Service Region.)

The fine package of Federal fringe benefits gives each Civil Service employee almost 22 percent additional salary. Most employees look only at the take-home pay in their bi-weekly pay envelopes. This really represents only part of the earned income of a Civil Service employee. A rough calculation of the cash value of fringe benefits would add at least one-fourth more to the annual salary of every Civil Service employee.

The average Federal employee makes about $5000 a year. This is the gross take-home pay. In addition to this basic salary of $5000, there are indirect benefits as follows:

The agency contribution to your retirement account (this is not the 6½ percent that you contribute to the retirement account - your agency contributes another 6½ percent)	$325
Eight paid holidays	$150
Annual leave computed at the average of 20 days used per employee per year	$386
Sick leave computed at the average of 6.3 days used per year (this would be much higher if it were figured on the 15 days earned per year)	$121
The agency's contribution and its share of your life insurance premium. This figures 12½ cents per $1000 of salary per pay day	$20
The agency's contribution toward your health benefits premium	$62
Unemployment insurance benefits, computed at the D.C. premium rate of .2 of 1 percent	$10
Employee compensation computed at the going rate of one-half of one percent salary	$25
	$1099

Actually the total cost is probably a little higher because many employees are entitled to military leave in addition to all other leave. For an employee earning $5000 a year this would be worth $386 per year. Other employees are called to jury duty. One week of jury duty would be worth $93 for an employee whose salary was $5000.

This study forces two conclusions. One is that the annual salary of government jobs is only part of our pay. At least 22 percent additional benefits, computed in cash, are given to us by Uncle Sam in the form of retirement, insurance, leave, etc.

The second conclusion is this: In cash value, in breadth of coverage, by almost any standards the package of fringe benefits now available to Federal Civil Service employees is as good as, if not better than, the package offered to private employees of the most progressive commercial and business firms.

It is easy to compute the cash value of your own fringe benefits. Here's the way to do it: Take your base salary. Take 6½ percent for the agency's retirement contribution. Take 3 percent for paid holidays. Take 7½ percent for annual leave. Take 2½ percent for sick leave. Take .4 of 1 percent for life insurance premium. Take 1-1/4 percent for health insurance premium. Take .2 of 1 percent for unemployment benefits. Take one half of 1 percent for employee compensation benefits. Add these percentages together and multiply these times your annual salary and you will get an approximate figure on the real wages you receive from your Civil Service job.

Merit Promotion Program Benefits Employees, Bureau

The Bureau's merit promotion program, which became effective January 1, 1959, was, in reality, a continuation of our previous promotion program with some minor changes.

The increased use of vacancy announcements, amplified statements on job duties and qualification requirements, has had a beneficial effect on employee morale. At the same time, the placement function has been facilitated, because employees express their preferences and availability in relation to specific job opportunities.

The number of promotions has increased markedly, which places more emphasis on the Bureau's promotion policy and the need for employees to be thoroughly familiar with its details. Considerable staff work is involved in preparing for each promotion in order to be certain that equity is maintained, optimum manpower utilization achieved, and the best qualified candidates promoted.

There is a continuing need, on the part of Principal Assistants, MIC's, and other supervisory officials, to keep employees fully informed of the promotion policy. The objective of the merit promotion program is to improve the Bureau's overall effectiveness, which in turn means career advancement for our employees.

For these basic reasons, it is a mark of good leadership for appropriate officials to highlight, from time to time, the content of Chapter D-35 of the Administrative Manual in staff meetings and group discussions or when counseling employees.

Length of Service Awards

30-Year Awards

William B. Chappell, WBAS Raleigh
Francisco A. Colon, Central Office
Richard A. Garrett, WBAS Topeka
Eugene H. Quinn, WBAS San Francisco
Walter C. Williamson, WBAS Madison

25-Year Awards

Edith E. Byers, Adm. Ops. Central Office
Norman B. Foster, PSL Central Office
Margarette Richardson, PWP San Francisco
Arthur W. Youmans, NHRP Central Office

15-Year Awards

Joseph B. Adams, Jr., WBAS Peoria
Robert D. Bottom, AWP New York
Walter H. Brandstetter, OCDM Everett
Alexander Campbell, POP Central Office
William E. Cobb, PSL Mauna Loa
Robert L. Gustafson, WBAS Denver
Alva J. Jones, WBAS Spokane
John P. Lee, DMO Miami
Stanley J. Marzec, WBAS Buffalo
Jack I. Merryman, WBAS Nashville
Gladys E. Meyer, F&SR Central Office
Richard A. Micka, WBAS Omaha
Henry G. Resendez, WBAS San Antonio
John T. Schilling, WBAS Atlanta
Francis K. Schwarz, Hydro Central Office
Robert W. Smith, DMO Kansas City
William J. Taliaferro, WBO Ponape
Hazel Tatro, WBAS Wilmington, N.C.
David R. Wheeler, WBAS Lubbock
Leonard Williams, Sr., RAO Kansas City

Welcome to the Weather Bureau

Betty A. Borger, Clerk-Typist, New York
Hattye M. Gibson, Card Punch Operator, San Francisco
Westley Kimble Goodsell, Met. Tech., Central Office
Charles Courtney Reeves, Electronic Technician, Central Office
John A. Rimkunas, Jr., Meteorologist, New York
James H. Schulze, Met. Tech., Johnston Island
Jay Watts, Meteorologist, New Orleans

Transfers

	From	To
Stanley M. Bakich	Bermuda	Miami
Wendell M. Cook	Salt Lake City	Seattle
Douglas L. Davis	McGrath	Barrow, Alaska
Thomas W. Davis	Atlanta	Washington
Yehelu Dismas	Koror	Majuro, T.T.
William V. Greco	Isachsen, Canada	Sault Ste. Marie
David G. Henchen	Barter Island	Nome, Alaska
Thomas F. Jackson	King Salmon	Brownsville
Mack Ohmart	Dodge City	Lynchburg
Akiro Osumi	Johnston Island	Honolulu
Frederick L. Pfeiffer	Miami	Sterling, Va.
Jack L. Poppe	Detroit	St. Louis
Walter J. Powell	Tatoosh Island	Meacham, Ore.
William N. Seiler	Suitland	Miami
John M. Sharpe, Jr.	New Orleans	El Paso
Robert F. Shaw	Suitland	Honolulu
Robert S. Shearston	Washington	Miami
Jack Steagall	Barter Island	Antarctica
Charles W. Thomason	Asheville	Cordova, Alaska
Edgar L. Tipton	Los Angeles	Glasgow, Mont.
Neil B. Ward	Oklahoma City	Kansas City
Cornelius C. Yalbuw	Yap	Truk, T.T.

Kansas City Man Wins Commerce Suggestion Contest

The first prize of $75.00 in the Department of Commerce Quarterly Suggestion Contest for the quarter ending September 30, 1960, was awarded to Archibald Hook, RAO Kansas City. Mr. Hook suggested a less expensive method of shipping helium cylinders used for filling upper-air sounding balloons (see TOPICS, December 1960, page 189).

George V. Lowrimore, of the National Bureau of Standards, was awarded the $50.00 second prize, and the third prize of $25.00 went to George H. Toole, of the Maritime Administration.

DEATHS

Cleeta E. Rosier

Mrs. Cleeta E. Rosier, Secretary to the Administrative Officer, RAO III, Kansas City, died on November 7. Mrs. Rosier worked for the Bureau in Kansas City from 1941 to 1946 and from 1954 until her death. She is survived by her husband, Edwin A. Rosier, of 10321 East 35th Street, Independence, Missouri.

Virginia E. Shive

Mrs. Virginia E. Shive, Payroll Clerk in the Regional Administrative Office at Fort Worth, died on December 6. Her government employment began in 1936, and she transferred to the Weather Bureau in 1948. Mrs. Shive is survived by her mother, Mrs. Edith M. Myers, and a daughter, Marjorie E. Shive, both of 5228 Collinwood, Fort Worth, Texas.

Awards for Superior Performance

Superior Performance Awards have been approved for 75 employees. These awards were granted primarily for maintaining exceedingly high standards of performance on the job or demonstrating unusual competence in an emergency.

Employees who have been cited for their excellent work are:

Delores Adams, Clerk-Typist, RFC St. Louis
Morton Bailey, Meteorologist, NWRC Asheville
Pat Barge, Teletypist, WBAS New York
William Barth, Elec. Technician, WBAS Columbia
Willard Broussard, Met. Tech., WBAS Columbus, Ga.

Doris Brown, Mail & File Clerk, RAO Anchorage
Mary Browning, Met. Tech., NWRC Asheville
Ernestine Buchanan, Clerk-Typist, Climat CO
Darathula Carraway, Met. Tech., Climat CO
Clifton Champion, Met. Tech., WBAS Columbia, S.C.

Marion Choate, Met. Tech., Climat CO
Omer Clarkson, Met. Tech., WBAS Corpus Christi
Jewell Cook, Card Punch Supervisor, WRPC San Francisco
Gerald Couard, Meteorologist, WBAS Birmingham
Robert Cox, Meteorologist, WBAS Spokane

Lawrence Dye, Meteorologist, WBAS Tampa
Charles Elm, Supply Clerk, RAO Anchorage
Agnes Gaskin, Clerk-Typist, WBO New York
Leonard Gilbert, Met. Tech., WBAS Columbus, Ga.
Charles Girton, Meteorologist, WBAS Los Angeles

Helen Grywaz, Clerk-Stenographer, WBO Chicago
Fern Gwynn, Procurement & Supply Clerk, RAO Salt Lake City
Daryl Hahn, Elec. Tech., WBAS Las Vegas
Harry Haigh, Met. Tech., WBAS Des Moines
John Harrison, Met. Tech., WBAS Las Vegas

Kenneth Hein, Tab. Equip. Opr. Supervisor, WRPC Chattanooga
Sarah Henkora, Met. Tech., WBAS Pendleton
Clyde Holmes, Sup. Met. Tech., WRPC San Francisco
Clark Horton, Stock Control Clerk, RAO Anchorage
William Ingram, Met. Tech., WBAS Winston-Salem

Charles Kearney, Met. Tech., WBAS Norfolk
Dorothy Kiser, Fiscal Assistant, NWRC Asheville
Arthur Kneer, Mathematician, NMC CO
Mary Kolden, Clerk-Stenographer, WBO Minneapolis
Stanley Lacy, Meteorologist, WBAS Medford

John Lanzaro, Teletypist, WBAS New York
Roberts Lehman, Printer, NWRC Asheville
Warren Lundfelt (Posthumous), NMC CO
William Lyons, Library Assistant, OMR CO
Joseph Mirisola, Sup. Chartist, WBAS New York

GROUP AWARD
CO, Property and Management Supply Unit
Frank S. Austin, Packer
Claude Poulson, Packer
Earl Beal, Packer
Ellis Forrest, Packer
Isaac Small, Packer
Charles Jackson, Packer
William Montgomery, Packer

GROUP AWARD
WBAS, Spokane
Robert Small, Meteorologist
Robert Cox, Meteorologist
Walter Highberg, Meteorologist
Marvin Walters, Meteorologist
Alvin A. Wilcox, Meteorologist
Richard Wise, Meteorologist
William Keating, Electronic Technician
Rex Thompson, Met. Tech.
Donald Brostrom, Met. Tech.
Calvin Scholten, Met. Tech.
Alva Jones, Met. Tech.

John Murray, Met. Tech., WBAS Williamsport
Wayne Norman, Met. Tech., WBAS Corpus Christi
Howard Page, Met. Tech., WBAS Las Vegas
Carl Peterson, Met. Tech., WBAS Rockford
Lewis Pierce, Library Assistant, OMR CO

Maurice Powell, Met. Tech., WBAS King Salmon
Dorothy Rembert, Pers. Clerk, NWRC Asheville
Teddy Sheehan, Obs.-Briefer, WBAS Oklahoma City
Olga Shirko, Teletypist, WBAS New York
Silvio Simplicio, Meteorologist, WBAS New York

Tena Smith, Secretary, F&SR CO
Samuel Trotter, Meteorologist, WBAS Richmond
Maxine Weber, Meteorologist, WBAS South Bend
Ervin Wesley, Met. Tech., WBAS South Bend
Donald Willson, Met. Tech., WBAS Las Vegas

Raymond Wrightson, Meteorologist, WBO Albany
Mr. & Mrs. Percival Kreigh, Airway Observers, West Plains, Mo.

Meteorological Readings

Assignment XLIII: Thermodynamics of Clouds, by Fritz Moller, pages 199 to 205 of the Compendium of Meteorology.

About the Assignment: This reading assignment deals with the effects of evaporation, heat exchanges, radiation, mixing processes, etc., on the release of instability energy during moist-adiabatic processes.

QUESTIONNAIRE

Col. 61 Condensation of water vapor on falling small water droplets appear to contribute very little to the formation of precipitation. This is because:

1. the droplets usually fall too slowly at first
2. the available moisture is rapidly used up
3. of the rapid influx of heat from the bottom of the cloud
4. the condensation process itself tends to equalize the temperatures of droplet and surrounding air.

Col. 62 Check the true statements.

1. Long-wave radiation is probably one of the contributors to night-time thunderstorms.
2. The interior of clouds always exhibit a moist-adiabatic lapse rate because of conduction.
3. In Schmidt's three definitions of moist-adiabatic processes only one appears to be valid (actually occurs in nature).
4. The modern radiosonde is more useful in cloud investigations than an instrumented airplane with an observer in it.

Col. 63 Christians and Schmidt both support the idea that evaporation of cloud elements on the surface of cumulus clouds:

1. accounts for the violent turbulence at edge of cumulus clouds
2. increases with height
3. is too weak to be thermodynamically significant
4. is more effective over the domes than along the sides.

Col. 64 Check the correct statement (or statements).

In the ideal moist-adiabatic process:

1. there is no transfer of mass, either water or air, between the parcel and the environment.
2. the vertical gradient of temperature within the rising column is always slightly more than that in surrounding air.
3. the lapse rate is proportional to the change in pressure.
4. there is never any transfer of heat between the parcel and the environment.

Col. 65 The slice method:

1. predicts a larger release of energy of instability than does the parcel method when both ascending and descending particles undergo the same changes of state.
2. provides no information regarding the amount of cloudiness.
3. yields a more accurate measure of instability than does the slice method when used near an old dissipated front.
4. was developed by Austin in an attempt to evaluate the effect of descending air masses surrounding cumulus clouds.

Col. 66 In the tropics the upper limit of cirrus clouds is 3 - 4 km. below the tropopause. This is probably due to:

1. lack of sufficient moisture transport upward.
2. incorrect estimates of the height of the tropopause.
3. strong vertical wind shear above this level.
4. strong radiation influences (heating from below) making the existence of cirroform clouds unlikely above this level.

Col. 67 The height of tops of cumulus clouds are predicted better by the slice method than by the parcel method because:

1. the parcel method fails to reliably predict the height of the condensation level.
2. the slice method takes the effect of the descending air mass surrounding a cloud into account.
3. the parcel method usually predicts too high an instability rate.
4. none of the above.

Col. 68 The temperature difference between cloud droplets and the surrounding air:

1. may reach several degrees only on outer edges of clouds.
2. may reach several degrees in clouds of low density.
3. is normally fairly large in clouds of high density.
4. is usually very small in all types of clouds.

Col. 69 The high kinetic energy in a squall is attributable, to a large extent, to the fact that:

1. descending air that contains liquid water follows the moist adiabat.
2. low-level inversions are missing.
3. an abnormally low amount of entrainment is taking place.
4. the freezing level is very low.

Col. 70 Let M' and M be the ascending and descending air masses respectively. If the value of M'/M

1. is comparatively large no cumulus can form.
2. is comparatively small the entrainment computations cannot be made.
3. is comparatively small the instability criteria computed by the parcel method are valid.
4. is small the slice method of computation gives more reliable results.

Forecasters' Forum

(NOTE: As discussed in TOPICS for January, 1960, Forecasters' Forum is included in TOPICS because of administrative reasons where formerly it was a separate publication. It still remains a function of the F&SR Division and editorial control of Forecasters' Forum rests with that Division. Contributions and comments regarding this department should be addressed accordingly.)

Computing the Mean Daily Temperature and Degree Days

Although the heating industry, in general, finds the heating degree day system now in use to be satisfactory, a few of its members have questioned the reliability of the mean daily temperature and have suggested the use of mean hourly temperature for computing degree-days for estimating fuel consumption. The heating industry has never taken such suggestions very seriously because they realize that no degree-day value can alone completely reflect the complex variations in fuel consumption.

An investigation, using hourly temperatures for computing the Mean Daily Temperature and Degree Days, with comparisons to the present system in use, is described below. Results indicate small daily differences, which over periods of a month and the heating season, apparently are negligible.

Degree Days, at the present time, are computed by adding the maximum and minimum temperatures for the day and dividing by two to arrive at a "mean"--the "mean" is then subtracted from 65 and the resultant figure is the number of Degree Days for the day. Some arguments have been advanced that in computing the above "mean," no consideration is given to the duration of any temperature (e.g., a maximum or minimum temperature may occur and last for several hours, or it may last for only a few minutes). Furthermore, days now having the same computed Degree Days apparently do not indicate the same "coldness". Since a measure of central tendency is desirable for computing Degree Days, perhaps the arithmetic mean of hourly temperatures rather than the popular "average" should be used. The arithmetic mean or simply the mean may be defined as the sum of the separate hourly temperatures divided by the number of hours ($M=\frac{\Sigma t}{N}$; where "t" equals the hourly temperature and "N" is equal to 24). Degree Days may be calculated from a Mean computed from 24 hourly temperatures.

An inspection of the tables below will help to elucidate and support the subject material.

Tables I and II are for two days having the same maximum and minimum temperatures (data for Chicago-O'Hare International Airport).

Table I

Day	11/5/58	11/23/58
Max. temp.	58	58
Min. temp.	38	38
Sum	96	96
Mean	48	48
Degree days	17	17

The above method of computing the daily Mean and Degree Days is that used at the present time.

It may be noted that although the two days used in Tables I and II have the same maximum and minimum temperatures, the temperature distributions for each day are decidedly different--with November 23rd being the "colder" day.

Table II

Hour	Temps. for 11/5/58	Temps. for 11/23/58
0100	57°F	39°F
0200	56	40
0300	56	39
0400	56	39
0500	56	39
0600	55	38
0700	55	38
0800	56	40
0900	55	43
1000	58	47
1100	53	50
1200	50	52
1300	47	55
1400	46	56
1500	47	57
1600	47	58
1700	47	48
1800	46	44
1900	43	44
2000	41	44
2100	41	43
2200	41	42
2300	40	40
2400	38	38
Sum	1187	1073
Mean	49	47 ($M=\frac{\Sigma t}{N}$)
Degree days	16	18

The above method for computing the daily Mean and Degree days is the suggested method (using 24 hourly temperatures).

Table III further illustrates the differences in Mean values arrived at by the two methods of computation.

Proceeding with the data from Table III a Chi-square Test may be computed to further determine the statistical significance of the difference between Means, computed by the above methods. The formula for Chi-square (X^2) may be stated

$$X^2 = \sum \left[\frac{(f_o - f_e)^2}{f_e} \right]$$

in which

fo = frequency of occurrence of observed facts (Means determined from 24 hourly temperatures)

fe = expected frequency of occurrence (Means determined from daily maximum and minimum temperatures)

From the data

$X^2 = 8.01$

df (degrees of freedom) = 30; entering a table of probabilities with 30 degrees of freedom, one can easily determine that the differences between the frequency distributions of the computed Means is clearly not statistically significant.

One can, therefore, conclude, from the above exploratory data, that the method of computing daily Means from daily maximum and minimum temperatures is highly reliable. As has been already inspected, factors other than temperature should be investigated and their significance determined in computing Degree Days.

Edwin S. Lazar
WBO Chicago

Table III

The following Means are computed for 31 days, chosen randomly from November and December 1958, at Chicago-O'Hare International Airport.

DATE (Nov.)	1	2	3	5	7	9	10	12	13	17	19	22	23	24	25	28	30
MEAN (using max. & min.)	47	45	47	48	39	43	42	43	57	63	41	38	48	38	37	21	11
MEAN (using 24 hrly. temps.)	47	45	48	49	43	41	41	44	56	65	40	39	47	38	38	20	12
DIFFERENCE	0	0	1	1	4	2	1	1	1	2	1	1	1	1	1	1	1

DATE (Dec.)	1	3	7	8	12	13	15	16	21	23	24	27	28	31
MEAN (using max. & min.)	26	34	10	3	8	2	3	18	17	32	26	38	39	27
MEAN (using 24 hrly. temps.)	23	34	11	7	7	1	4	21	17	33	26	37	38	27
DIFFERENCE	3	0	1	4	1	1	1	3	0	1	0	1	1	0

RETIREMENTS

French E. Mason

French E. Mason, Office Appliance Repairman at the National Weather Records Center in Asheville, retired on December 21, 1960, after six years of Weather Bureau service. He had previously worked for the Post Office, General Accounting Office, and private industry, and had been a minister for seven years. Mr. Mason's address is 54 Gray Street, Asheville, North Carolina.

Albert M. Helwig

Albert M. Helwig, an Illustrator in the Central Office Drafting Section, retired on December 24, 1960. Before joining the Weather Bureau in 1947, Mr. Helwig worked for other government agencies and in private industry. He operated his own advertising art business for a number of years. Mr. Helwig's address is 3234 Belmont Avenue, Baltimore 16, Maryland.

Ernest M. Stewart

Ernest M. Stewart, Meteorological Technician at the Weather Bureau Airport Station in Galveston, retired on December 31. Before joining the Bureau, Mr. Stewart was a pastor and a teacher in Mississippi for many years. He came to the Weather Bureau in 1941 as a Junior Observer at Jackson, Mississippi, and later served at Lake Charles, Louisiana, and Texarkana, Texas. Mr. Stewart's address is 2109 K Street, Galveston, Texas.

Victor T. Horn

After 32 years of Weather Bureau service, Victor T. Horn, the Meteorologist in Charge at Parkersburg, West Virginia, retired on January 9. Mr. Horn entered on duty at Denver in 1928 and has served at San Francisco, Billings, Portland, Seattle, and Fairbanks. His address is 1030 Ann Street, Parkersburg, West Virginia.

CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

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U. S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

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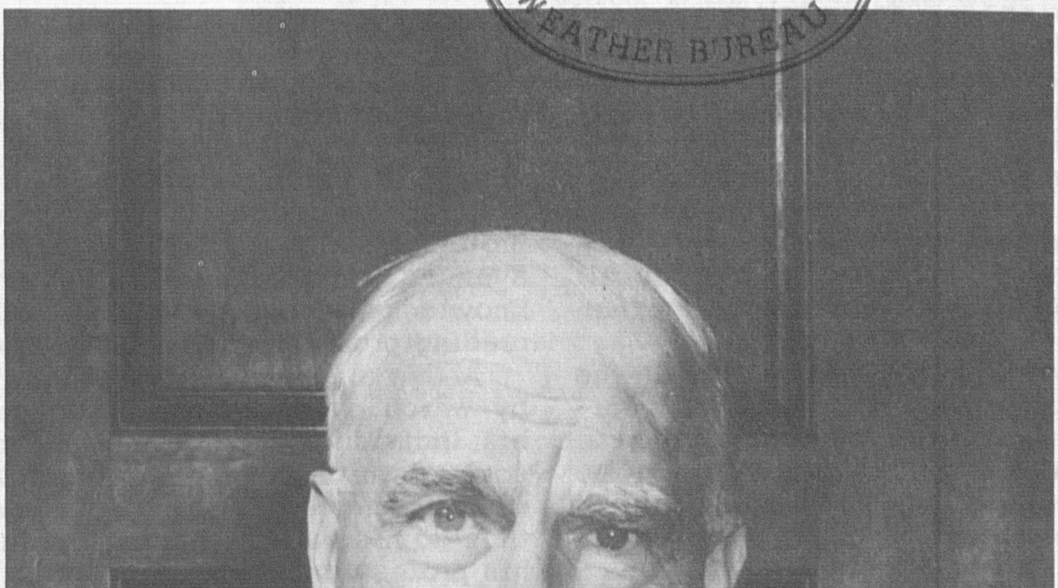
TOPICS



Luther H. Hodges

Editorial

The Value of AMS Membership

The American Meteorological Society is the professional and scientific organization representing weathermen throughout the Americas. It was founded in 1919 for the development and dissemination of knowledge of meteorology in all its phases and applications and for the advancement of the professional ideals of meteorologists.

The growth of the AMS since its establishment has been noteworthy indeed. The ever-increasing development and accelerated progress of the science of meteorology make the Society's continued growth and its support by all meteorologists even more important than before.

A meteorologist's membership in the AMS identifies him with his fellow scientists and with the broad objectives of the Society. It gives him a voice in the meteorological plans and activities of the Hemisphere and offers a means of concerted action toward a common purpose.

Membership in the Society represents more than just a subscription to the monthly Bulletin, special rates on book purchases, notices of meetings and information of professional opportunities or "Meteorologists Wanted"; it gives the more important opportunities to contribute to the Society's plans and publications, to bring orderly improvements in meteorological interests, to assist in promotion of scientific progress, and to support the highest standards in meteorological practice. It brings beneficial professional associations and opens avenues for exchange of scientific knowledge beyond that gained solely by reading professional publications.

Above all, membership is the means by which every meteorologist can give his individual support to the American society which stands for the advancement of meteorology as a science and thus do his part in shaping the future of his profession.

F.W.R.

What Do You Think?

In the past months, TOPICS has undergone several changes in makeup and format. Some new departments have been added, such as Topigrams, Briefs from the CO Staff Conferences, Transfers, Welcome to the Weather Bureau, and most recently an editorial page.

Comments about TOPICS and these changes are always welcome, because TOPICS is your magazine. It should reflect your desires and meet your needs.

We particularly want to solicit comments from readers for inclusion in a "Letters to the Editor" column, which will appear on the editorial page if there is sufficient response. These comments could range from criticism or advice about TOPICS itself, to praise or rebuttal of a specific article, or any exchange of views at all about Weather Bureau activities and programs.

Anonymous letters cannot be printed, but the name of the correspondent will be withheld upon request.

TOPICS Deadline

The deadline for submission of material for publication in TOPICS is now the fifteenth of the month preceding the date of the issue. For example, any article for April TOPICS must be received by March 15th.

New Secretary of Commerce

The appointment of Luther H. Hodges as Secretary of Commerce was confirmed by the Senate on January 21, 1961.

Luther Hartwell Hodges was born March 9, 1898, in Pittsylvania County, Virginia. He attended public schools in Leaksville and Spray, North Carolina, his family having moved to this area in the year 1900. Following graduation from high school in 1915, he entered the University of North Carolina and was graduated in 1919 with an A.B. degree. He served briefly in the U.S. Army in which he held the rank of Lieutenant.

Following his military service, he began his career in the textile industry starting as secretary to the manager of a local textile mill in the Leaksville-Spray area, and in 1938, following several intermediate promotions, he was made general manager in charge of manufacturing for Marshall Field and Company. In 1943 he became Vice President of that Corporation.

He was head of the Textile Division of OPA in 1944, and consultant to the Secretary of Agriculture in 1945.

In 1950, upon retirement from private business, he spent over a year in West Germany as head of the Industry Division of the Economic Cooperation Administration, and was consultant to the State Department in the latter months of 1951 on the International Management Conference.

In November 1952 he was elected Lieutenant Governor of North Carolina, and succeeded to the Governorship in November 1954 upon the death of Governor William B. Umstead. Governor Hodges was re-elected Governor of North Carolina in November 1956, and his term ended in January 1961.

Mr. Hodges is past Chairman of the Southern Governors' Conference and of the Southern Regional Education Board. He was one of the nine American Governors to make an extensive tour of the Soviet Union in the summer of 1959, and was subsequently in charge of his State's Trade and Industry Mission to Europe in November 1959.

The Secretary married Miss Martha Blakeney of Union County, North Carolina, in 1922. They have two daughters, Betsy (Mrs. D. M. Bernard, Jr.) of Anacortes, Washington; Nancy (Mrs. John C. Finlay) of Rangoon, Burma; and one son, Luther, Jr., who is now attending the Graduate School of Business Administration at Harvard University.

Many times during his terms as Governor of North Carolina, Secretary Hodges has taken an active interest in storm warning services and has used his offices to contribute to effective cooperation and use of warnings to safeguard life and property.

Under Secretary of Commerce for Transportation

Clarence D. Martin, Jr., is the new Under Secretary of Commerce for Transportation. The Weather Bureau, the Coast and Geodetic Survey, the Maritime Administration, and the Bureau of Public Roads are supervised by the Under Secretary for Transportation.

Mr. Martin was born October 23, 1916, in Spokane, Washington. He graduated from Harvard in 1938 and studied for a year at the University of Washington School of Law.

After two years in the flour milling business, Mr. Martin was called to active duty in the United States Navy, where he rose from the rank of Ensign to Lieutenant Commander.

Upon release from active duty in 1946, Mr. Martin formed a partnership in Seattle, Washington, engaged in wholesale hardware and later a raw materials business. Since 1950 he has been in business in Los Angeles County, California, having a retail automobile dealership at Santa Monica and real estate developments in California and Arizona.

Mr. Martin's father, the late Clarence D. Martin, was Governor of the State of Washington from 1933 to 1941.

Mr. Martin is married to the former Charlotte Mary Yeoman of Butte, Montana. They have three children, Diana, 7; Cary, 5; and Bradley, 4.

Clarence D. Martin, Jr.

Topigrams

Washington, D.C.
February, 1961

A new class of observing stations has been established by agreement between the Weather Bureau and the Federal Aviation Agency. Many locations served by FAA towers and combined station/towers do not have weather observations available from a local source and, therefore, cannot properly discharge their air traffic control obligations with respect to assigned control zones as required by the Civil Air Regulations. The new stations, which are intended to eliminate this deficiency, will be known as LAWRS (Limited Airport Weather Reporting Stations). It is anticipated that eventually there will be close to 100 LAWRS.

Gordon Dunn, Chief District Meteorologist at Miami, is spending 60 to 90 days in Pakistan to consult on the development of public typhoon warning services. After the two disastrous typhoons that hit East Pakistan in the autumn of 1960, the Pakistan government requested the services of a Weather Bureau expert to discuss plans to reduce typhoon fatalities in the future.

The Weather Bureau will furnish support for project "MOHOLE", which is sponsored by the National Science Foundation and the National Academy of Sciences - National Research Council. Scientists will attempt to penetrate the earth's crust under the ocean at a location about 40 miles east of Guadalupe Island. Knowledge gained from ocean sediments will enhance the understanding of the earth's climates. The Weather Bureau will send a meteorologist to the drilling station to provide regular warnings and advisories on the state of the sea and other significant weather phenomena.

Preliminary figures indicate that 48 people died as a result of tornadoes in 1960, making it one of the lowest years on record for tornado fatalities. Only five years since 1916 have had fewer fatalities.

The Ninth Weather Radar Conference of the American Meteorological Society will be held in Kansas City on October 23-26, 1961. The conference will be co-sponsored by the Weather Bureau and the Kansas City Seminar of the AMS. Papers are invited on all phases of radar meteorology, especially new applied techniques for the operational use of radar weather observations.

In cooperation with the Soil Conservation Service of the Department of Agriculture, Weather Bureau State Climatologists are engaged in a continuing project of preparation or revision of County Soil Survey Reports. These reports include a county climatic summary to be prepared by the State Climatologists. Two or three county reports are scheduled per year per state.

Twelve selected stations have been asked to cooperate with the International Atomic Energy Agency (IAER) in a program of collecting precipitation samples for chemical analysis.

The Joint Numerical Weather Prediction Unit

The Joint Numerical Weather Prediction (JNWP) Unit of the National Meteorological Center is a cooperative effort of the Weather Bureau and the Navy and Air Force weather services for automation of weather forecasting. Established in 1954, the Unit operates under the guidance of the Joint Meteorological Group.

JNWP performs research in the field of numerical weather prediction, develops new techniques for weather prediction, and uses electronic equipment to make daily operational forecasts. The automatic methods of weather data processing developed at JNWP constitute a revolution in weather analysis and forecasting.

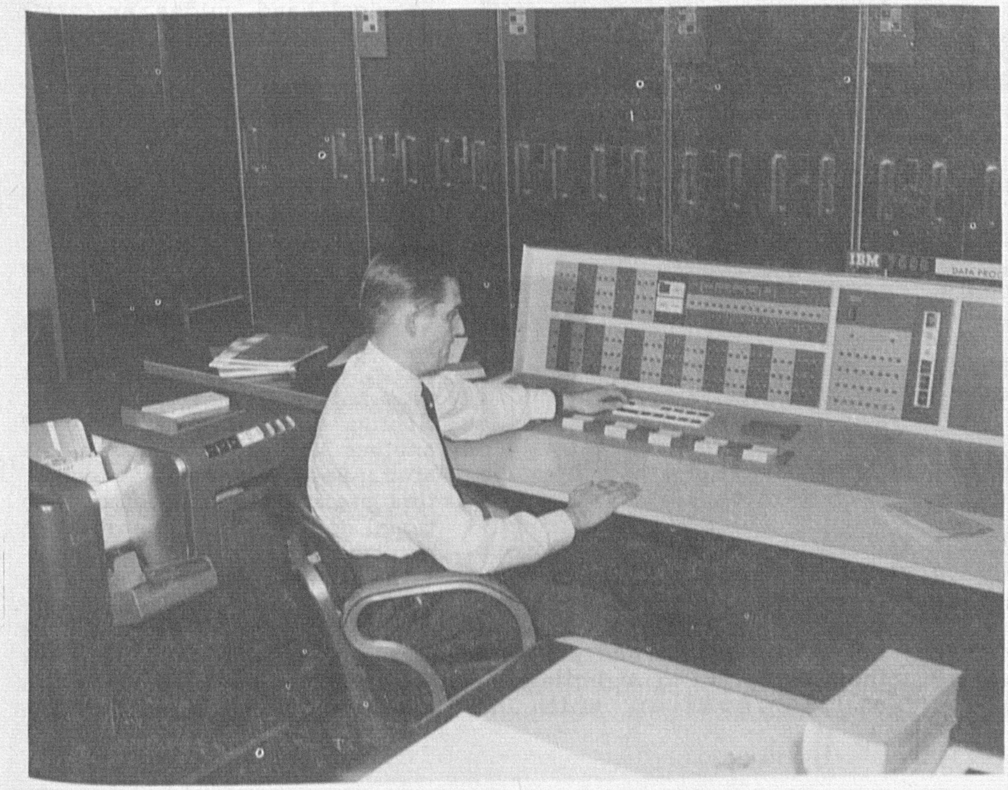
Data on two upper-air observations per day--0000Z and 1200Z--come to JNWP from points all over the Northern Hemisphere. They are received on eight teletypewriters in the form of perforated tape. These tapes are edited and run through an IBM Tape Card Punch machine which punches one card for each teletypewriter line.

The punched cards then go into a card reader which transfers the data to magnetic tape for use in the computer. The computer "reads" the information from the magnetic tape, selecting reports, decoding them, checking them, and locating them geographically. Next the computer analyzes the data into grid arrays, using guidance material that is also fed into it on tape. The analyses and forecasts come from the computer on magnetic tape, designed to control a machine that prints the data or to control a data plotter that draws maps automatically.

Several of these steps will soon be eliminated when the new Automatic Data Communicator comes into operational use. The Data Communicator will do away with the manual editing of the upper-air data, the conversion from teletypewriter paper tape to punched cards, and the hand loading of the cards into the computer. Instead, the data will be read directly from the teletypewriters onto magnetic tape and will be "untouched by human hands" from the moment they are received at JNWP until they emerge from the data plotter in the form of weather maps.

In March 1955, shortly after JNWP was established, its first computer, an IBM-701, was installed. One month later, JNWP began experimental forecasting. In 1957, the 701 was replaced by a 704 which was, in turn, replaced by the 7090 in 1960.

The speed of these machines allows calculations that never could be done by humans. In one second, a 704 computer can add a column of ten digit numbers as high as the Washington Monument, and the 7090 is six to ten times as fast. In one hour or less, the 7090 computer completes computations that took



Major Forrest R. Miller, of the Air Force's Electronic Computing Branch, seated at the console of the IBM-7090 computer. The tape units can be seen in the background.

Lester George, of JNWP, at the controls of the electronic data plotter. The map of the Northern Hemisphere, measuring 30 by 30 inches, is drawn by the mechanical hand in less than three minutes.

the 704 six hours. The shorter calculation time has an obvious impact on the efficiency of those operational activities which rely on the analyses and prognoses of JNWP. For instance, an accurate forecast of the weather at a SAC refueling point can be available two or three hours earlier than was previously possible.

The installation of the IBM-7090 has enabled JNWP to expand its output by a substantial amount, especially the output of hemispheric analyses. It is now analyzing on a hemispheric basis four fields for each of the four pressure surfaces: namely, height, temperature, and wind vectors for 850, 700, 500, and 300 mb. Total computer time required for a set of these analyses is ten minutes.

The higher speed of the 7090 has brought great improvement in scheduling of analyses and forecasts. JNWP can now complete and distribute a preliminary set of hemispheric analyses and barotropic forecasts about 4-1/2 hours after observation time. Distribution of the final set of complete analyses and forecasts begins about 6-1/2 hours after observation time and ends about nine hours after observation time.

Twenty-six prognostic charts and twelve analyses produced by JNWP are transmitted daily on the new facsimile network. Two more analyses (fallout) are scheduled to begin soon.

Three automatic data plotters were installed at JNWP in the latter half of 1960. A data plotter can draw a complete weather map in less than three minutes or about seven times faster than it could be copied from the weather map produced by a printer. Moreover, the electronically produced weather maps are more accurate than the hand copied maps. The data plotter reads control information from the magnetic tape and presents the information to a digital-to-analog converter, which instructs a plotting board to draw contours on the map. Its mechanical hand guides an inked stylus on instruction from the analog impulses. The completed maps are checked for accuracy by experienced forecasters.

Also in 1960, JNWP added a computer-to-computer microwave link which enabled them to use the National Bureau of Standards' 704 computer for their calculations during the changeover from the 704 to the 7090. Because the 704 cannot work fast enough to meet the deadlines for the 7090, this link is not in use at present, but JNWP is now establishing a microwave link with another 7090 computer in the area. Back-up computer facilities are needed to meet operational deadlines in case of computer breakdown.

Research at JNWP is directed toward the development and testing of more accurate and comprehensive methods of numerical weather prediction and toward the development of efficient automatic methods of data processing and analysis.

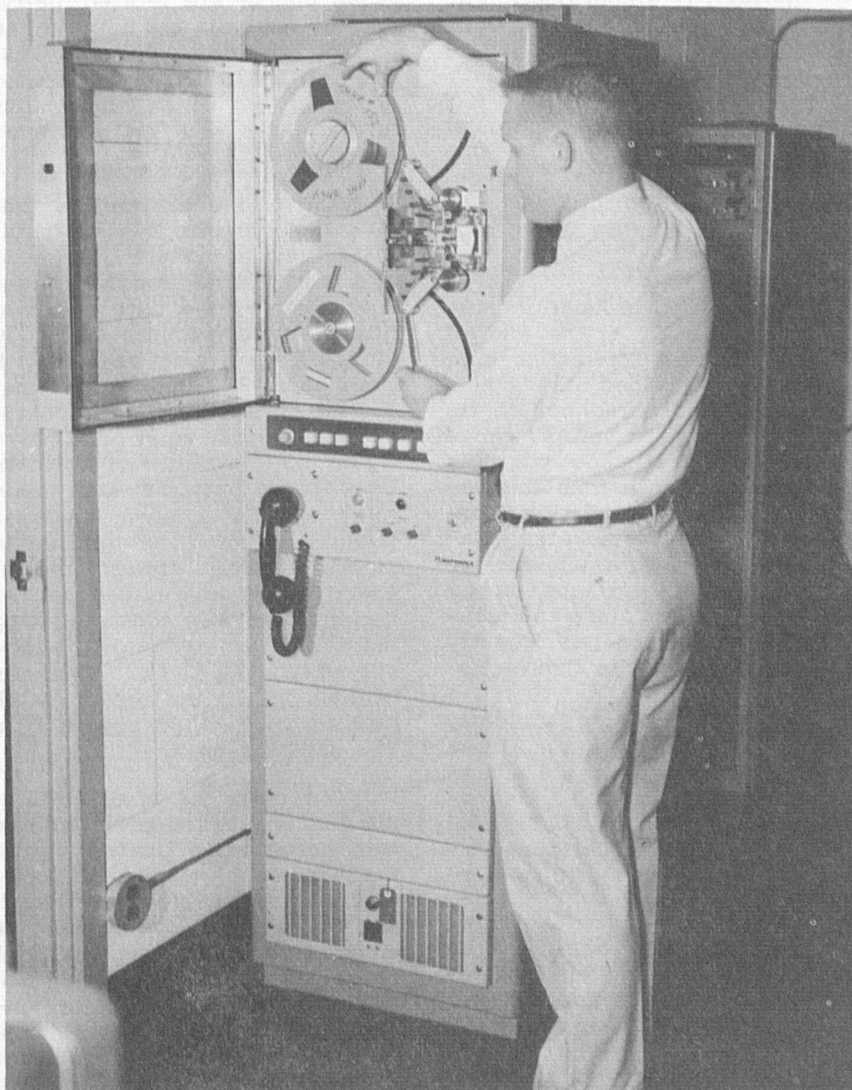
The development and testing of improved atmospheric models begins with the diagnosis of errors in forecasts based on numerical methods that are in current operational use. With this diagnosis as a guide, the equations expressing the basic physical laws of the atmosphere are put into a new and more general form that is less subject to error. Numerical methods for solving these equations must be reduced to a routine and programmed for the computer. Predictions based on machine-computed integrations are then compared with the observed course of events, and their accuracy and effectiveness are judged in relation to the performance of earlier numerical methods, subjective methods, and the requirements of using agencies.

It is important that numerical prediction methods which appear promising be used in daily forecasting. A limited series of tests on a new model can lead to misleading conclusions. The correct diagnosis of the behavior of a new model, together with its errors, can only be made after watching it closely in daily forecasting.

For this purpose, daily map discussions are held at the National Meteorological Center. Through these discussions, the experience and observations of the forecasters are brought to bear on the problem of model performance, and the practicing forecasters responsible for central analysis are kept intimately aware of the capabilities of the numerical methods which they are using. This close relationship between meteorological research and operational weather forecasting is essential for the advance of numerical prediction.

The benefits of research and development in atmospheric models, concurrent with their operational use, are direct and measurable. When the JNWP Unit was established, it was thought by several leaders in the field that the problem of short range forecasting had been solved, at least in principle. Since that time, JNWP has succeeded in eliminating errors which were not properly appreciated at first, but which were devastating in daily practice.

The development of a satisfactory baroclinic forecasting model has been JNWP's main developmental project for some time. Its main efforts in baroclinic model development are directed into primitive equation models. The chief problem here has been that of numerical instabilities which arise and destroy the forecast within a few hours. The successful attainment of baroclinic forecasting capability will open the door to a multitude of new applications.



Peter L. Ottman, of JNWP, adjusts the magnetic tape on the computer-to-computer microwave link.

International Analysis Center Studies Antarctic Weather Patterns

The International Antarctic Analysis Center (IAAC), established at Melbourne, Australia, in 1959, is one of the promising outgrowths of the International Geophysical Year.

The IAAC is a continuation of the IGY Antarctic Weather Central, which was operated at Little America V from 1956 to 1958 as part of the United States' IGY Antarctic Program. Personnel from the United States, the Soviet Union, Argentina, France, Australia, South Africa, and New Zealand participated in the program.

When the Little America station was closed at the end of 1958, Australia offered to host the Center, provided other countries assigned personnel to its staff. The United States, whose participation is made possible by research grants from the National Science Foundation, sent Thomas I. Gray, Jr., to the Center. France has assigned one meteorologist, and Australia two. In addition, a meteorologist from Argentina has recently been assigned to the Center.

The Center prepares daily analyses of weather conditions over the Antarctic and its surrounding seas, making these available by radio to all Antarctic bases. It also performs research into the synoptic meteorology of the area.

During its first year of operation, meteorologists at the Center prepared daily synoptic analyses for the area south of 30° S for the 1000, 500, and 300 mb. levels for 0000Z. The 700, 500, and 300 mb. levels were analyzed at 1200Z for the area south of 60°S. The charts were microfilmed and copies distributed to the members of the Special Committee for Antarctic Research.

Following the adoption of a revised work program for the IAAC, the analysis program has been restricted to twenty-four hour sequences at 0000Z, and the microfilm will include only these analyses. Although the 1200Z charts are plotted daily, and the analysts are using these to develop the daily analyses, the unit will not take the time necessary to finish the charts for inclusion with the published sequences.

Some of the difficulties that face the synoptic meteorologist in this vast area were illustrated in a recent letter from Mr. Gray. For example, the data received from the area amounts to 13,000 groups a day, compared with more than 300,000 groups per day for the Northern Hemisphere. The synoptician must lean heavily on his knowledge of Northern Hemisphere patterns and theories. Single station analysis techniques must be applied to virtually every station report. Added to these problems are the serious delays in communicating the data, with occasional widespread blackouts. Changes worked out at the recent SCAR meeting in England should help this aspect significantly.

Because of the small staff at the Center, its research program was necessarily limited during the first year. The addition of new meteorologists to the staff and the revision in the analysis program have given a substantial boost to its research program. The group has three projects under way: monthly mean charts; an investigation of interrelations of Antarctic pressure waves and surges within the continent and with respect to northern land area; and a study of surface weather in Antarctica as it is related to general circulation patterns.

Bureau Men Speak At AMS Meeting

The 41st Annual Meeting of the American Meteorological Society was held in New York City from January 23 to January 26.

A special symposium on Analysis of TIROS Observations took place on the opening day. Dr. Sigmund Fritz, Jay S. Winston, D.Q. Wark, and G. Yamamoto, all of the Bureau's Meteorological Satellite Laboratory, and Vincent J. Oliver, of the Forecasts and Synoptic Reports Division, participated in the symposium.

Donald L. Gilman, of the Extended Forecast Section, took part in a session on Application of Statistical Methods.

Dr. Reichelderfer was a member of a Panel on Meteorological Satellites held on the morning of January 25.

G.A. DeMarrais, of the Weather Bureau Research Station at Cincinnati, participated in a discussion of Atmospheric Structure.

G.W. Brier, of the Office of Meteorological Research, took part in a symposium on Meteorology and Climatology.

A paper co-authored by Luis Aldaz, of the Office of Meteorological Research, was presented at a symposium on Cloud Physics.

Virginia Testing Site Snowbound Two Days

The snowstorm that struck the East on December 11 left personnel of the Bureau's Observational Test and Development Center at Sterling, Virginia, snowed in for two days. Although temperatures varied between 7 and 20° F. with wind gusts up to 45 knots, upper-air observations were continued.

Although field stations have been snowed in many times in the past, this is an unusual occurrence for the Washington area. If it has happened to any stations recently, we'd like to hear about it.

Weather Bureau Participates in Three Phases Of Antarctic Research Program for 1961

This year the Weather Bureau is again participating in the U.S. Antarctic Research Program. The National Science Foundation, an independent Government agency, sponsors the Antarctic Research Program through grants awarded to government agencies, universities, and scientific institutions.

The Weather Bureau has received three National Science Foundation grants for 1961: $628,541 (of a budgeted $849,187) for the Antarctic Meteorological Research Program-1961; $99,156 for a study of atmospheric - oceanic - glaciologic interaction; and $15,763 for the Weather Bureau's participation in the International Antarctic Analysis Center (see page 28).

The Antarctic Meteorological Research Program - 1961 will be carried on by 21 Weather Bureau meteorologists. Seven of these will be stationed at the Amundsen Scott South Pole Station; five at Byrd Station; and three each at Hallett, Wilkes, and Ellsworth.

The program includes standard surface observations, upper-air soundings, and surface radiation measurements at all five stations; upper-air radiation measurements at Byrd, Pole, and Hallett Stations; and total and surface ozone determinations and airborne-radioactivity measurements at the South Pole Station.

Surface and upper-air measurements taken by U.S. Weather Bureau personnel will be used in continuing global meteorological studies started during the International Geophysical Year.

Radiation, albedo, and heat flux measurements will be used to study and better understand energy exchanges between the snow surface, the atmosphere, and space.

Surface and balloon-borne measurements of upward and downward flux of infrared radiation will yield vertical profiles of radiative cooling and heating rates at the surface, in the troposphere, and in the stratosphere.

Prior to the IGY, study of the atmospheric circulation in the Southern Hemisphere was virtually impossible because of the lack of observational data from the Antarctic and its surrounding oceans. Weather systems had to be analyzed assuming certain patterns resulting from the high, cold, extensive land mass of the Antarctic. The network of stations established during and since the IGY has provided basic observation coverage for further meteorological study of the continent, although the meteorology of the oceanic area still remains largely unknown. Observations have been possible over the continent for only four years, providing insufficient data for long-term study of cyclical patterns and periodic variation in Antarctic climatology. Furthermore, special programs providing insight into energy exchange and balance, vertical energy transport, radiation at height and at the surface, and chemical composition of the atmosphere have been possible only in more recent years.

Data obtained through this project will be available to the International Antarctic Analysis Center at Melbourne, Australia, the Antarctic Weather Central, the Office of Meteorological Research, the Navy, and to other researchers both here and abroad.

The grant for research into atmospheric-oceanic-glaciologic interaction provides for analysis, description, and correlation of the physical properties of the atmosphere, ocean, and ice in and around Antarctica. Emphasis will be upon the study of the heat and water budget of the system. The project continues data analysis begun during the IGY and will make it possible to integrate meteorological data collected during the first year of the U.S. Antarctic Research Program with those taken during the IGY.

Continued and more detailed investigation will make possible the study of the heat and water exchange between the oceans surrounding the continent and the snow surface of the polar ice cap. Further information is expected to contribute to greater understanding of the mass wastage and accumulation occurring on the continent and whether a balance exists between these two processes.

The study will also include determination of the transport of heat and moisture within the Antarctic area and the studies of seasonal and yearly variations. Consideration will be given also to significant features of the Antarctic Circumpolar Oceanic Current, the zones of convergence and divergence, and the sea-ice distribution. Net radiation regimes for several regions over a period of several years will be determined and their relation to the heat budget will be assessed.

Employees Improve Hygrothermometer

Raleigh A. Marshall, WBAS Norfolk, Virginia, noticed that during certain fog conditions the hygrothermometer temperatures read several degrees too low because of condensation and therefore could not be used for official observations. Assisted by Fred A. Ploeger, the AAET, Mr. Marshall made a number of experiments and found that a certain waterproofing compound could be used on the terminal strips to eliminate the erroneous readings. As a result of the efforts of these two men, the Bureau is now putting into use a hygrothermometer which prevents erroneous readings by using a terminal strip with a leakage point many times that of the original strip. Mr. Marshall and Mr. Ploeger have both received awards for submitting this suggestion (see page 34).

Midwestern Tornadoes 'Heard' in Washington

In October 1960, scientists at the National Bureau of Standards reported that sounds produced by tornadoes in the Midwest had been detected by a specially designed microphone and recording system in Washington, D.C.

This equipment was developed by the Bureau of Standards for use in studying very-low-frequency sounds in the atmosphere. The infrasonic pressure waves are received by four ground-level microphones, placed so as to form a quadrilateral averaging about 7.5 km. on a side. The output of each microphone is transmitted by telephone wires to a central location where the signals are filtered into several frequency channels and recorded as ink-on-paper traces. When a sound wave of sufficient magnitude is present, similar traces are produced on each of the four paper records. The speed and direction of the wave and the front are obtained by comparing the different times of reception at the four microphones.

D.M. Caldwell, of the National Bureau of Standards, calibrates an infrasonic microphone (in front) which is connected by a hose to the calibrating barrel. An oscillating piston (on top) produces an accurately known sound pressure in the barrel at various low frequencies. The metal barrel is padded on the outside to reduce thermal effects. (National Bureau of Standards photograph)

Infrasonic pressure waves have been received that appear to originate in the vicinity of severe tornadic storms up to 1200 miles away in the central United States. The equipment was operated continuously during May 1960. The speed and direction (azimuth) of all infrasonic arrivals were compared with reports of tornadoes and funnel clouds supplied by the Weather Bureau. For example, Weather Bureau reports for May 5, 1960, showed 19 tornadoes and funnel clouds in Oklahoma and Texas and one tornado in northwestern Kansas which could have produced the sound waves received at Washington from that azimuth range during a 4-1/4 hour interval on that date. Similar waves believed to be from tornadic storms were received during eight such time intervals in May. There was some indication that the storms may have produced the very-low-frequency sounds even before the formation of a funnel.

The Bureau of Standards is planning a similar sound-recording installation to be located near Boulder, Colorado.

The Weather Bureau is considering the feasibility of using such a system for tornado detection. There are, however, a number of drawbacks. The detection of a tornado by this method is not instantaneous, depending as it does on the speed of travel of sound waves (about ten miles per minute). Also, in the areas of tornado occurrence, wind-produced noise levels may be higher than they are in Washington. Too high a noise level would prevent the detection of tornadoes by instruments located near enough to permit an adequate advance warning. Finally, it would be quite expensive to put many of the currently developed instruments in the areas most frequently visited by tornadoes.

Bill Cullen and Ernest Christie Broadcast from New York City Weather Bureau

ON JANUARY 6, New York's WNBC radio station did all of its broadcasting from the new offices of the Weather Bureau in Rockefeller Center. Radio personalities Bill Cullen, Art Ford, and Jim Lowe discussed the work of the Weather Bureau with MIC Ernest J. Christie and the members of the staff. By the end of the day, almost every phase of Weather Bureau operations had been described for the listening audience. George Dietrich, manager of WNBC, presented a trophy to Mr. Christie and the staff as a token of appreciation.

Chicago WBO Publicizes Automatic Telephone Service

The following paragraph from a special release, "Chicago's Busiest Telephone Number," put out by the Weather Bureau Office in Chicago, provides a good example of one of the many opportunities to lead the public toward obtaining weather information through mass dissemination channels rather than direct telephone contact with Weather Bureau stations.

"WEather 4-1212 is only one of a number of automatic distribution facilities utilized by the Weather Bureau in Chicago. It is not possible to talk personally to everyone who desires a weather forecast...and the Weather Bureau depends upon automatic distribution facilities and the cooperation of newspapers... radio... TV and press associations for the distribution of weather forecasts and information. In order to provide the same service as furnished by the automatic weather telephone system in Chicago...more than 500 people would have to be on duty in the Weather Bureau. The Weather Bureau therefore encourages the public to call WEather 4-1212 for the Chicago and vicinity forecast...in order that the Bureau's other trunk lines can be used to provide information not available on WEather 4-1212."

Meteorological Readings

Assignment XLIV: Meteorological Conditions Over Puerto Rico During Hurricane Betsy, 1956, by Jose A. Colon, Monthly Weather Review, Volume 87, Number 2, February 1959.

QUESTIONNAIRE

Col. 61 Experience with Betsy leads one to believe that its track, allowing for observational error, resembled:
1. a parabolic curve
2. a discontinuous curve
3. a sinusoidal curve
4. a straight line

Col. 62 Experience with Betsy confirms the observation that the lowest pressure, the geometric center of the cyclonic wind circulation, and the radar eye
1. are coincident
2. have no mutual relationship whatsoever
3. are generally not coincident
4. are oriented along a line in the direction of movement of the storm

Col. 63 With respect to the underlying surface, the behavior of Betsy at Puerto Rico, on moving from land to water, resulted in
1. further filling
2. little change in central pressure
3. renewed deepening
4. diminution of maximum winds

Col. 64 From comparisons at Puerto Rico, the relationship or variation between hurricane intensity and rainfall intensity is:
1. direct
2. inverse
3. one varies as the square of the other
4. only slight variation

Col. 65 What was the experience of San Juan radar observers on the effect of underlying surface (land vs. water) on the radar picture during the time the storm was still partially over water?
1. minor differences
2. portion over water more distinct
3. portion over land more distinct
4. water surface produces false echoes

Col. 66 Calculations seem to show that Betsy moved
1. faster over land than over water
2. faster over water than over land
3. the same average speed over land and water
4. slower through the mountains

Col. 67 What was the average rainfall per hurricane hour at San Juan during the San Felipe and Betsy Hurricanes?
1. 9.37 and 3.19 inches per hour
2. .28 and .25 inches per hour
3. .33 and .13 inches per hour
4. 3.19 and 9.37 inches per hour

Col. 68 What was the main reason for assuming that navigational errors connected with tracking Betsy were at a minimum?
1. aircraft contained up-to-date equipment and thoroughly competent personnel
2. the storm was small, hence easily observed
3. landmarks were always nearby for checking navigation
4. storm provided good radar target at all times

Col. 69 What was found to be the approximate ratio of the amplitude of the oscillation of the track to the estimated error of determining the center fix?
1. 10:1   3. 3:1
2. 7:1   4. 2:1

Col. 70 What happened to the radar picture of the hurricane eye as the storm passed into the Puerto Rico mountains?
1. became more distinct
2. deteriorated
3. vanished
4. developed clearly defined multiple centers

Length of Service Awards

35-Year Awards

John E. Foster,
Factory Inspection Unit, Baltimore, Md.
Paul H. Kutschenreuter,
Ass't Chief, Central Office
Edwin T. Lay,
OMR Central Office

30-Year Awards

Adolph A. Bander,
RAO Salt Lake City
Charles A. Sabine,
NWRC Asheville
Wilmer L. Thompson,
RAO Fort Worth

15-Year Awards

Morton H. Bailey,
NWRC Asheville
Donald R. Baker,
Hydro Central Office
James T. Burgin,
NWRC Asheville
Clarence E. Cerny, Jr.,
PWP San Francisco
Ruby B. Crook,
NWRC Asheville
Arnold E. Federman,
F&SR Central Office
Clinton E. Fowler,
WBAS Huron, S.D.
Samuel Goodmond,
NWRC Asheville
Carl N. Hollis,
WBO Cape Hatteras
Sidney O. Howick,
WBAS Portland, Oregon
Wilbur F. Mincey,
WBO Lakeland, Florida
John G. Norris,
PSO Honolulu
Elizabeth C. Pearson,
NWRC Asheville
John K. Rhyne, Jr.,
WBAS Jackson, Miss.
William E. Rudolph,
WBAS San Diego

Vital Statistic

Whether you're taking the family on a long weekend auto trip this month or just driving to the neighborhood grocery, stay alert. And while you are driving carefully, keep this fact in mind: it takes about 1,500 nuts to hold an automobile together, but only one to scatter it all over the landscape.
(Reprinted from the C & P Call, October 1960.)

Welcome to the Weather Bureau

John Parker Armbrust, Meteorological Technician, Peoria, Ill.
Ansel Lee Benge, Meteorological Technician, Central Office
Harold James Brodrick, Jr., Meteorologist, Central Office
Shirley J. Capstick, Clerk-Typist, St. Louis
Charles Cotton, Cartographic Draftsman, Central Office
Henry E. Fleming, Mathematician, Central Office
Maria E. Gonzalez, Accounting and Fiscal Clerk, San Juan
John T. Gordon, Meteorologist, Central Office
Harold A. Haugen, Meteorological Technician, Central Office
Jeannette M.C. Ho, Teletypist, Honolulu
George Daniel Jones, Meteorological Technician, Central Office
George D. Middleton, Meteorological Technician, Miami
Samuel L. Shaw, Meteorologist, Phoenix
Richard J. Wagner, Meteorological Technician, Eniwetok
Ralph Duane Weber, Meteorological Technician, Central Office
Charlene Anita Woody, Mathematician, Central Office

Miami DMO Employees Receive Awards For Performance in Hurricane Donna

Superior Performance Awards have been granted to the following employees of the District Meteorological Office in Miami, in recognition of their excellent work during the approach and passage of Hurricane Donna:

Arnold Sugg, Meteorologist
Leonard Pardue, Meteorologist
Rollo Dean, Meteorologist
Harry Yates, Meteorologist
Sanford Neuman, Meteorologist
Francis Drybala, Meteorological Technician
Martha Spector, Meteorological Technician
Edward Manak, Meteorological Technician
Lorraine Kelly, Meteorological Technician
Louise Neely, Meteorological Technician

Airways Observers Mrs. Marjorie Collins of Skwenta, Alaska, and Mr. and Mrs. D'Burl Teeters of Puntilla, Alaska, received awards in recognition of their timely and unusual action in volunteering to provide additional weather observations which were so urgently needed following the disappearance of the Weather Bureau aircraft and during the subsequent search.

RETIREMENTS

Richard D. Monks

Richard D. Monks, Teletypist at the Weather Bureau Airport Station at New York International Airport, retired on disability on December 21, 1960. Mr. Monks has had 13 years of government service. His home address is 29 Champlain Street, Terryville, Long Island, New York.

Charles A. Reinhart

Charles A. Reinhart, Meteorological Technician at the Weather Bureau Airport Station in North Platte, Nebraska, retired December 22nd on disability. Mr. Reinhart served in the Navy from 1952 to 1954. He joined the Weather Bureau in 1955 at North Platte, where he remained except for three months with Polar Operations at Resolute Bay. Mr. Reinhart's address is 3822 Madison Street, Ogden, Utah.

Edna E. Watts

Edna E. Watts, Stock Control Clerk in the Central Office, retired on December 10, 1960. Miss Watts was a teacher in Oklahoma and Maryland before entering government service. She worked for the Department of Interior from 1933 until 1942, when she came to the Weather Bureau. Miss Watts' address is Ednor Road, Ednor, Maryland.

Transfers

	from	to
Robert G. Adams	Yuma, Arizona	Los Angeles
William E. Cobb	Washington	Hilo, Hawaii
Richard L. Flint	Washington	Battle Creek
Richard M. Glommen	Anchorage	Detroit
Edward J. Mallumian	Worcester, Mass.	New York
Frank B. Mauk	Key West	Miami
James E. Morris, Jr.	Fort Worth	Midland, Texas
James C. Myers	Seattle	Indianapolis
Robert A. Nibert	Toledo	New York
Robert William Preshong	San Francisco	Eniwetok
Edward T. Sjoberg	Antarctic	Arctic Drift Station
William G. Sooter	Anchorage	Kansas City
Harold S. Springer	White Sands Missile Range	Suitland
Thomas T. Tatekawa	Kwajalein	Eniwetok
Eugene F. Thompson	Port Arthur	El Paso
Richard L. Urbanak	Antarctica	Sterling, Va.
Warren R. Wallis	Madison, Wis.	Lakeland, Fla.
Oliver L. Wattenbarger	Ice Floe Station	Athens, Ga.

Weird Accidents Made News in 1960

Was the big news of the year 1960 the presidential election? or maybe the space race? or Cuba? or the UN fracas? or Donna?

Well, not necessarily. At least not to Walter Klausner; nor to Robert Coon; nor to teenager Keith Hodges; nor to Patrolman Francis P. Sheehan.

Please be informed, friends, that Mr. Klausner was run down by a bear -- on a bicycle. Mr. Coon found a 60-foot boxcar in his basement. Keith Hodges developed a specialty that made him stand out. And Patrolman Sheehan slipped on a pencil.

See why the election and those other top stories had to share the headlines? And these were only a few of the weird and wacky wonders uncovered by the National Safety Council in its annual roundup of accidental absurdities.

The case of the bumptious bear occurred in Miami Beach, Florida, where a big, furry show-off was grandly riding a motorcycle around a ring in the Ringling Brothers, Barnum and Bailey Circus. Giddy with pride, he lost control, veered into Trainer Klausner, and sent him to the hospital with leg injuries. The bungling bear barely managed to retain his driver's license.

It may be possible that someone reading this has never gone to his place of business in the morning and found a 60-foot boxcar reposing in the basement. For him, Robert Coon, of Mason, Michigan, has this tip: "You'll be surprised."

The boxcar that greeted Mr. Coon was one of 22 derailed in the heart of Mason. The other 21 were less presumptuous.

Every eager baton twirler tries to develop a specialty in his routine that will make him stand out.

Teenager Keith Hodges did just that during a parade in Santa Barbara, California, when his glistening baton flipped high in the air, encountered a wind gust, took off, and hit the Honorable Edmund G. Brown, Governor of the State of California, smack on the head. Keith felt worse than the Governor did.

Patrolman Francis P. Sheehan, of the Lockport, New York, police, slipped on a pencil at the head of the stairs, cascaded all the way down, and was taken to the Lockport Memorial Hospital with back injuries. The pencil that threw him was a souvenir from the Lockport Memorial Hospital.

Sure, there was a national election in 1960 and a lot of other big news. But these items made the papers, too.

Suggestion Award Winners

Richard L. Johnson	WBAS, Pueblo, Colo.	$50
Raleigh A. Marshall	WBAS, Norfolk, Va.	50
Richard L. Bailey	WBAS, Fresno, Calif.	25
Earl C. Bradford	NWRC, Asheville, N.C.	25
Sanford Neuman	DMO, Miami, Fla.	25
Max W. Mull	WBAS, San Francisco	20
Fred E. Ploeger	WBAS, Norfolk, Va.	20
Dorus D. Alderman	WBAS, Mobile, Ala.	15
Rachel W. Babb	NWRC, Asheville, N.C.	15
Carl L. Crandall	NWRC, Asheville, N.C.	15
Richard M. Davis	NWRC, Asheville, N.C.	15
Nathaniel R. Davis	NWRC, Asheville, N.C.	15
Sylvester E. Decker	WBO, Escanaba, Mich.	15
James E. Denaro	WBO, New York, N.Y.	15
James B. Freeman	NWRC, Asheville, N.C.	15
Kathryn R. Green	NWRC, Asheville, N.C.	15
Dorsey P. Marting	WBAS, Winslow, Ariz.	15
Fred H. Mayeda	WBAS, Seattle, Wash.	15
John B. Moody, Jr.	NWRC, Asheville, N.C.	15
Seymour Schamach	NWRC, Asheville, N.C.	15
Roger R. Watkins	Hydrologic Services Div., Central Office	15
Henry E. Wise	WBAS, E. Boston, Mass.	15
Virginia S. Hocking	NWRC, Asheville, N.C.	10
Aran Markarian	WBAS, San Francisco	10
Helen E. Senter	WBAS, Albany, N.Y.	10

GROUP AWARD - NWRC, Asheville, N.C. 15
Pherne P. Anderson
Bruce H. Blankenship

DEATHS

Albert R. Damare

Albert R. Damare, Chartman at the Weather Bureau Office in New Orleans, died on December 25th. Mr. Damare had worked for the Weather Bureau since 1958. He had previously served four years in the Air Force. Mr. Damare is survived by two brothers, Emile I. Damare, New Orleans, and Wilton G. Damare, Pomona, California, and two sisters, Mrs. Samuel E. Martinez and Mrs. Gerard F. Maxwell, both of Metairie, Louisiana.

Gerald C. Merchant

Gerald C. Merchant, who was Meteorologist in Charge at Columbia, South Carolina, for 19 years, died on January 4, 1961. Mr. Merchant had retired in 1953, after 44 years with the Weather Bureau. He had served in Washington, D.C., Meridian, Miss., Augusta, Ga., Grand Junction, Colo., and Greenville, S.C., in addition to Columbia. Mr. Merchant is survived by his widow, Mary E. Merchant of Winder, Ga., three sons, one daughter, and ten grandchildren.

Forecasters' Forum

(NOTE: As discussed in TOPICS for January, 1960, Forecasters' Forum is included in TOPICS because of administrative reasons where formerly it was a separate publication. It still remains a function of the F&SR Division and editorial control of Forecasters' Forum rests with that Division. Contributions and comments regarding this department should be addressed accordingly.)

Grand Rapids MIC Favors Hazardous Driving Warnings

During the last weekend of October 1960, thirty people lost their lives on the highways of Michigan. The Secretary of State for Michigan, after careful investigation, stated that most of the fatalities were due in part to slippery driving conditions. While there is no standard pattern of procedure in the variety of conditions to be found in snowstorms across the country, it seems sure that the Weather Bureau is in a position to contribute substantially to highway safety in winter.

Vigilance appears to be the watchword in carrying out our responsibility for any severe weather warnings expected to be effective. Recognition of situations liable to cause the hazardous condition before it develops is necessary. Once we have pinpointed the situation we should "take the bull by the horns" and issue the warning, even before the accident reports start coming in. Freezing rain or blowing, drifting, or heavy snow cause hazardous driving conditions and should be the occasion for a warning; but we all know that a light wet snow on cold pavements which have been dry for some time may create one of the most slippery conditions possible.

Coordination of snow and road condition reporting is probably lacking in many states. It is improving in Michigan, and the Weather Bureau here as well as in any area can do a great public service in improving highway safety by promoting coordination and frequency of reporting by state, county, and local police and highway offices, truckers, and others. Use of our local teletypewriter circuits to assist in distributing these reports as received from highway sources, as well as weather warnings and storm progress reports, is most effective. (Editor's note: The Weather Bureau, however, does not originate forecasts of road conditions, since these are so highly dependent upon facilities available for clearing roads.) Due to the perishable nature of road reports, arrangements have been made in southwest Michigan for current conditions to be reported at any time of day as soon as requested by this office. This is done through cooperation of the sheriffs' offices by sheriff radio. This year for the first time state police reports are collected twice daily at 6 a.m. and 6 p.m. statewide and passed to the Weather Bureau and others. This agency also collects reports from various districts during any time of day when conditions are changing.

Forum readers might help with another real problem: what to do to protect lives against the small but violent tornado which dips down briefly and then dies. We are told that about 60 percent of tornadoes which occur are in existence 15 minutes or less!

Fred Baughman, MIC
Grand Rapids, Mich.

Long Copy Holder for New Teletypewriter Can Be Ordered Through Central Office

The long copy holder on the front side of the Teletypewriter Models 15 and 19 has been omitted on the new Model 28. In its place, but this time on the front, is a neat copy holder that will hold paper up to and including six inches.

One field station has advised the Central Office of its need for a holder that will accommodate a full page. For stations or employees who would prefer not to fold the long transmissions in half for use on the present holder, AT&T has an 11-inch copy holder (Item 36C561) available. There is no installation or monthly charge for this item. The Central Office, Synoptic Section, will place orders for stations wanting them for AT&T-leased equipment (A, O, and RAWARC). Before requesting the long copy holder, stations should check with the local maintenance representative to see if this holder will interfere with access to the next teletypewriter.

We believe Western Union and the local telephone company could furnish a similar item if it is needed on their equipment.

CONTENTS

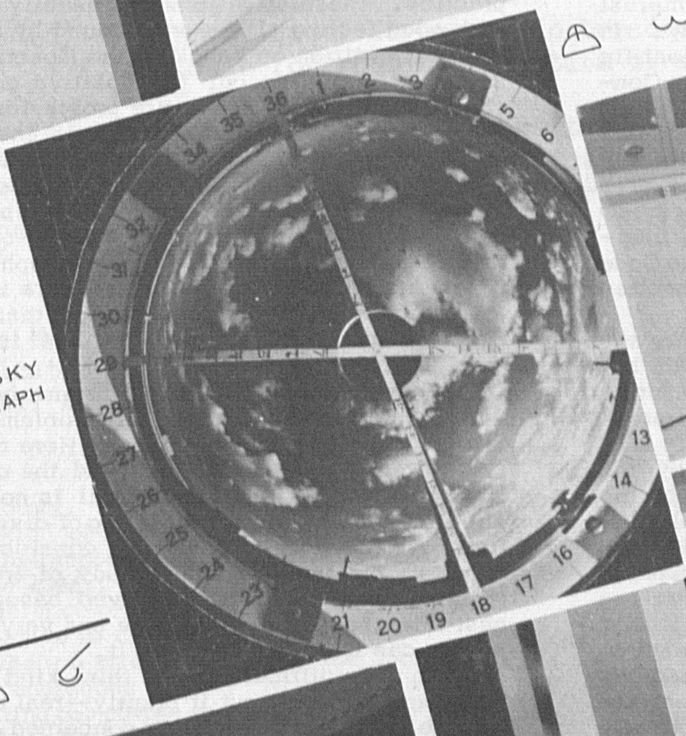
WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS *is distributed for official use only.*

TOPICS

MARCH 1961

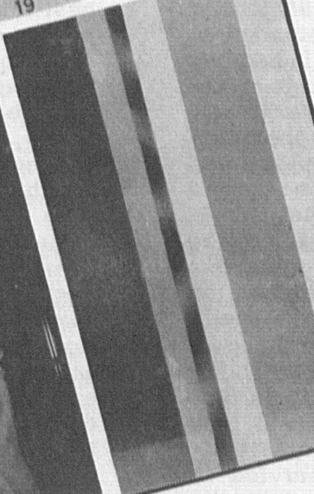
Volume 20

EXTENDED FORECAST SECTION



WHOLE SKY PHOTOGRAPH

CLOSED CIRCUIT TV WEATHER BRIEFING



COMMERCE AWARDS

UNITED STATES DEPARTMENT OF COMMERCE

WEATHER BUREAU

Editorial

AMS Policy on Ethics

(Reprinted, by permission, from the Bulletin of the American Meteorological Society, December 1960.)

One of the heartening features of our way of life is the continuing scrutiny which is brought to bear on the moral fabric of our times. Preservation and strengthening of the ideals, the principles, and the ethical standards of conduct we all cherish are matters that should be of real concern to each of us.

This is a matter of more than passing interest to the American Meteorological Society. In common with most professional and scientific societies, we include as a provision in our Constitution a Society objective which is concerned with the advancement of the professional ideals of our field. A few years ago, the Council appointed a special committee under the able chairmanship of Leonard W. Snellman to review the present code of ethics, to provide an interpretation of the statements contained in the Code and to recommend procedures for the Committee on Professional Ethics and Standards.

In its report to the Council, this committee pointed out that the semantics involved in the Code itself is not as important as is "the forthrightness of the Council in meeting ethical problems." It seems to be appropriate at this time to review the machinery established by the Council for handling alleged violations of the Code of Ethics and to explain the general principles that have guided the Council in its occasional encounters with these vexing problems.

First, a word about our Committee on Professional Ethics and Standards (COPES). Basically, it is a fact-finding group. It is not intended to be the "watch-dog" of the Society. It handles only those cases which are referred to it by the Executive Committee after a written complaint has been received by the Secretary of the Society. After a careful review of the complaint and the collection of such information as is required to make an informed judgment of the case, COPES submits a recommendation for action to the Council. This recommendation may propose one of several courses of action: to dismiss the charges, to send a written warning, to censure, to suspend membership for a period of time, or to terminate membership. Before turning to the manner in which the Council acts on these recommendations, it is fitting to remark that over the years COPES has quietly but consistently and effectively performed a notable service in carrying out a difficult assignment and rightfully deserves the gratitude of all our members.

How, then, does the Council deal with those situations in which there appears to have been a transgression of the Code of Ethics by a member? Clearly, the Council cannot take direct action against an individual who is not a member of the Society. To begin with, one can in general distinguish between three kinds of complaints which are brought before the Council. The first is usually a borderline case in which a professional member has -- almost inadvertently it would seem--overstepped the bounds of sound ethical practice. These situations are usually resolved with good feeling all the way around by a friendly letter, written on behalf of the Council by the Secretary, pointing out the positive good that can be achieved for the entire profession by meticulously adhering in practice to the ethical standards we subscribe to in principle and mentioning the instance in which it seems that statements, actions, or advertising appeared to overstep the bounds of good taste -- or at any rate of good meteorology. The philosophy underlying this approach is that it is more important to encourage good ethical practices than it is to chastise minor infractions. It has invariably been successful.

The second kind of complaint involves such delicate and inherently difficult problems as unfair competition and fee cutting. Here the guide lines are not too well defined and the combined wisdom of COPES and the Council is not always sufficient to obviate some feeling of dissatisfaction. A great deal of thoughtful consideration is given to these cases and a body of traditional practice is slowly being evolved based on the best thinking that very sincere and very capable people can bring to bear upon it.

Even more difficult is the third kind of complaint in which--to put it bluntly--real quackery is involved. This might be concerned, for example, with wildly extravagant claims of amazing accuracy in forecasting the day-to-day weather six months -- or six years -- in advance. Now every meteorologist nourishes the faint but unquenchable hope that some day this will be possible. But if that day does arrive, it will be marked -- we would hope -- not by a spectacular story in the press or trade magazine but by a serious article in a reputable scientific journal in which the scientific basis for the technique is exposed to the scrutiny and criticism of the scientific community with some reproducible statistics verifying the results.

In the kind of example we are considering, it is more likely that the primary support offered in justification of the claims is fragmentary and

Briefs from the CO Staff Conferences

The Chief of Bureau reported on the Weather Bureau briefing to Departmental officials held on Saturday, February 18. The one-hour briefing covered the following subjects: research, climatology, aviation, and future plans. In the discussion which followed, a number of questions were raised by Secretary Hodges and his staff:

(a) The perennial question of "duplication" in meteorology
(b) Service charges (user charges) for airlines, private meteorologists, etc.
(c) The practice of direct radio broadcasts by Bureau personnel
(d) Timetable for routine operation of meteorological satellites--their future cost
(e) Use and ownership of aircraft by the Bureau
(f) Financing other agency services through transferred funds

The staff was requested to consider these problems and to be prepared to comment on future course of action at a subsequent meeting.

Mr. Vernon reported on the recent Miami Hurricane Conference and indicated that, as a result of certain recommendations, the Interdepartmental Agreement is being revised.

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unsatisfactory. Every meteorologist is familiar with the kind of long-range prediction that can be made by randomizing the climatological statistics on clear, cloudy, and rainy days and, with a tolerance of one day, provide results that are impressive to the uninitiated.

The question arises: What can the Society do in this or analogous cases? To set up a special investigating committee to evaluate these claims would simply by-pass the time-tested method of having this evaluation take place by publication. Moreover, anyone who has perpetrated this kind of hoax in the first place will be equally capable of coming up with a "new technique" which can be claimed to remove the difficulties which prevented the first scheme from living up to its advance billing. Trying to prove this kind of individual is wrong is a frustrating and usually fruitless enterprise and certainly the energies of our Society can be directed along more productive lines.

Formal and well-publicized expulsion or suspension from the Society might provide temporary satisfaction for the affront to our sense of ethical standards, but would inevitably raise about the head of the offender the unbecoming but lucrative halo of martyrdom.

The policy of the Society in such cases, as promulgated by the Council, is simple and straightforward: to encourage the resignation of the member and to accept it when it is tendered and then proceed to do everything in its power to advance the science and technology of meteorology and to keep the public informed concerning the state of the science by preparing and periodically revising statements on aspects of meteorology that are of interest to the general public. This places on each member the burden of acting with a sustained sense of responsibility and understanding -- responsibility for bringing to the Council's attention possible breaches of the Code of Ethics, and understanding that in the most serious cases of quackery a quiet separation from the Society may be more effective than public expulsion.

This is the policy which the Council feels will prove to be most beneficial in the long run.

Thomas F. Malone, President
American Meteorological Society

Topigrams

Washington, D.C.
March, 1961

On January 26, a new all-time high for calls to WE-1212 in one day was established in Washington, D.C. 477,148 calls were recorded on that day, when a heavy snow warning had been issued for the Nation's Capital. This exceeded the record high day for 1960, which was set in New York City on March 3, 1960 (see page 49).

The WMO Panel of Experts on Meteorological Satellites met in Washington from February 7 to 10. The participants were Dr. G. Robinson, United Kingdom, Chairman; Mr. W.J. Gibbs, Australia; Dr. Harry Wexler, Director of the Office of Meteorological Research; and Dr. K. Langlo, of the WMO Secretariat. The Panel is planning for the rapid communication of satellite data to interested countries.

There was an early beginning to the 1961 tornado season in Oklahoma. During the evening of February 17, winter tornadoes cut paths of destruction through Central Oklahoma, heavily damaging one town and battering four others. The Evening Star, Washington, D.C., credited the Bureau's alerts with "keeping the casualty rates low in the face of widespread property damage." Five tornadoes were listed and all were within the forecast areas.

The Weather Bureau Clear Air Turbulence Research Unit will conduct an intensified data-collection program during a five-day period in the latter part of March. The test area is roughly that between the Rockies and the Appalachians, and observations will be limited to 18,000 feet or higher. Special data cards have been furnished to the major airlines and other flight groups.

During the latter part of February, the San Francisco to Anchorage radiofacsimile extension of the High Altitude network became operational at a speed of 120 scans per minute. Initially, it will be a one-way operation. Anchorage to San Francisco transmission capability will be added during 1961.

On March 23, the Weather Bureau joined the World Meteorological Organization and its 100 member nations in the observance of World Meteorological Day. Dr. Reichelderfer said, "No nation can maintain an effective meteorological service without international exchange of weather information. Through the WMO, the nations of the world have found solutions to the many problems involved in such exchange and, for the benefit of all, have joined together to form one world-wide weather observing network."

To everyone's relief, the construction on the sixth floor of the Central Office Administration Building has been completed. During March, the Personnel Management Division moved from the first floor to the newly enlarged sixth floor. Records Management, formerly in the basement, now occupies the first floor.

Extended Forecast Section

The Extended Forecast Section of the National Meteorological Center is responsible for weather forecasts beyond the range of the 24- and 36-hour daily forecasts. In addition to issuing 5-day and 30-day outlooks, the Section conducts a research program aimed at improving and automating long-range weather forecasting, carries on occasional training programs for Weather Bureau and foreign meteorologists, and serves as a source of information for press, radio, and television on persistent abnormal weather.

The regularly scheduled output of the Section consists of forecasts of average weather conditions expected in the Northern Hemisphere during ensuing 5-day periods and a twice-monthly 30-day outlook.

The 30-day forecast for the Northern Hemisphere depicts mean airflow aloft, prevailing tracks of cyclones and anticyclones, departures from normal temperature, and expected precipitation classes for the 30-day period following the forecast date. The Average Monthly Weather Resume and Outlook, prepared in this section and published by the Weather Bureau, covers the 30-day period after the forecast date, as well as the conditions observed during the preceding 30 days.

The 5-day forecasts, for periods beginning two days after the forecast day, are prepared each Sunday, Tuesday, and Thursday and are transmitted on the evening of the same day. These forecasts are the chief guide used by Weather Bureau Forecast Centers in preparing the local 5-day forecasts for release to the public.

The 5-day forecasts include a prediction of the average hemispheric circulation at sea level and at approximately 10,000 feet. The average is broken down into expected daily prognostic pressure charts containing fronts, air masses, and precipitation areas for each of the five days, from which weather trends may be estimated. Finally, departures from normal temperature and approximate quantities of precipitation expected over the 5-day period are outlined for the contiguous United States.

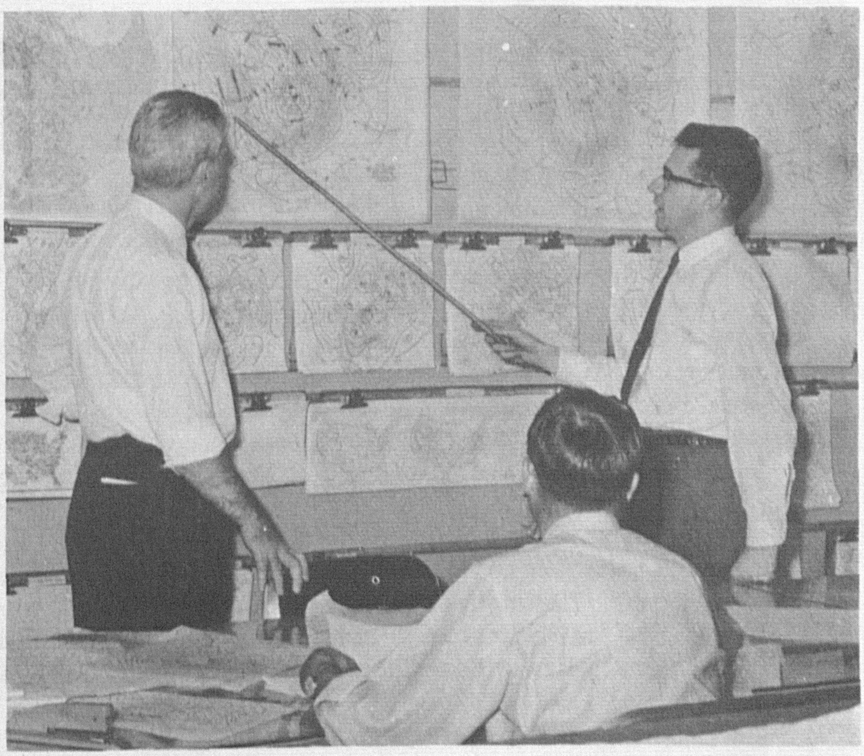
In the 5-day and 30-day forecasts, predicted temperature and precipitation are given in classes or ranges of values which have been determined from climatological records. For temperature, five classes are used: much above normal, above normal, near, below, and much below normal. The near, above, and below normal classes each occur one-fourth of the time, while the extremes, much above and much below, each occur one-eighth of the time.

Precipitation is divided into three classes--light, moderate, and heavy--the normal expectancy of each class being one third.

Special forecasts, for military operations, Arctic resupply missions, and similar operations, are prepared frequently. The Section also provides specialized forecasts, such as precipitation estimates for flood control engineers, and considers such problems as forecasting the likelihood of tornado occurrence over broad areas, ice conditions in the Great Lakes, and the first frost of the season.

The 5-day and 30-day outlooks are distributed by facsimile and teletypewriter throughout much of North America and are sent overseas by civil and military radio, radiofacsimile, and radioteletypewriter networks. These forecasts are used by many foreign countries, especially Canada.

The long-range outlook is of considerable importance to agriculture and industry in planning periodic adjustments in produc-



James O'Connor, Robert Gelhard, and William Klein (left to right) prepare a five-day mean forecast.

tion. The Section's forecasts are used by power and fuel companies and business concerns involved with manufacturing or shipping schedules affected by weather changes. The 5-day forecasts are used by the Navy in computing the optimum routes for its ships, and it is estimated that the fuel savings alone amount to several hundred thousand dollars annually.

The government became especially interested in long-range forecasting during the dust bowl days. In 1935, with funds appropriated by the Bankhead-Jones Act, the Weather Bureau, the Bureau of Agricultural Economics, and the Department of Meteorology of the Massachusetts Institute of Technology began a concerted attack on the problem of long-range weather forecasting.

During the first year of this research, the work of existing schools of long-range weather forecasting was studied and reviewed. Combining ideas gleaned from these studies and experience with upper-air data observed over the United States, a joint Weather Bureau-M.I.T. project began to develop a practical method of long-range forecasting. Experimental 10-day forecasts were prepared each week for many cities of the Northern Hemisphere. The first official 5-day forecasts were issued in the fall of 1940 from Cambridge, Massachusetts.

In 1941, upon completion of research leading to a methodology, the project was moved to Washington, D.C., and became an operational and research unit of the Weather Bureau.

Shortly before the outbreak of World War II, the military services became more actively interested in long-range forecasting. Knowledge of general weather conditions is of vital importance in military planning. The services needed such information as general weather and wind characteristics over an extended period following an invasion and the prevailing wind flow aloft over long periods for efficient transport of planes.

Donovan Truesdell (left) and Billy Lewis (right) compare a machine printout with an analysis drawn by the automatic data plotter.

While 5-day forecasts were of great value to the military, their requests for forecasts covering longer and longer periods led the Section to begin organized research on 30-day forecasting in 1942. In 1945, experimental 30-day forecasts were prepared for a limited number of industries. Then, in 1946, the Section began issuing the regular 30-day outlooks in their present form.

The very foundation of long-range forecasting is the realization of the global nature of weather patterns, the knowledge that local weather conditions may be determined by far-off events.

In issuing an extended forecast, the Section first filters out the daily disturbances by hemispheric averaging of the patterns over 5-day or longer periods. This focuses attention on the large-scale features which determine how the daily weather systems, such as storms, behave.

The effects of anomalous conditions -- or deviations from the normal -- in the hemisphere are then assessed. The circulation is always out of balance in some parts of the hemisphere, or may become out of balance as the season changes. Since the atmosphere is a fluid in motion, these imbalances produce changes in an attempt to restore equilibrium. The extended forecast procedure is designed to predict the most probable way in which the atmosphere will restore this equilibrium. This is done with the help of elaborate physical and statistical methods, employing electronic computers.

To sum up, the forecasters predict the large-scale average atmospheric flow and from this they deduce the temperature and precipitation anomalies. The latter phase is also greatly assisted by modern numerical methods.

The Section has conducted an extensive program of verification of its long-range forecasts. The verification of the 30-day outlooks for the six years ending December 1959 show that the forecasts of wind patterns and temperature have been definitely superior to forecasts that might be made using climatological probability or persistence. Precipitation forecasts were also better than climatological probability, but the scores here were lower than for temperature. These results will soon be published in Weather Bureau Technical Paper No. 39, "Verification of the Weather Bureau's 30-Day Outlooks."

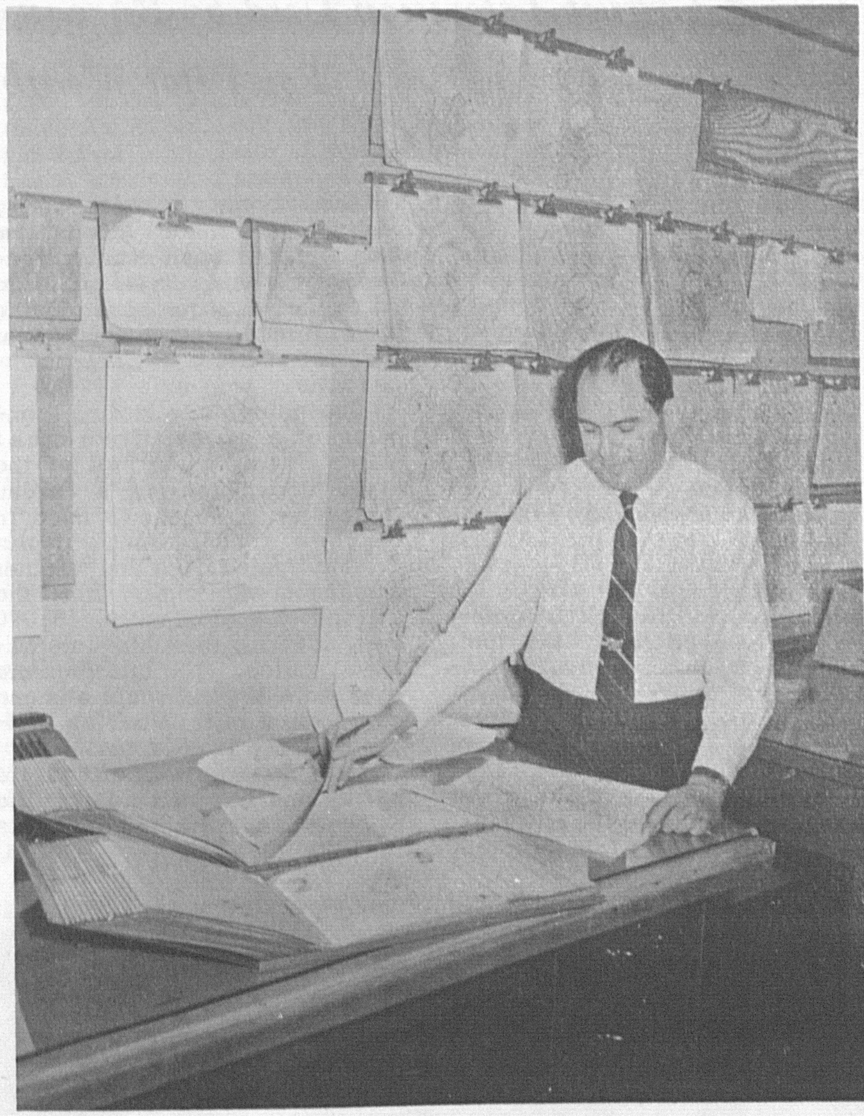
Marked improvement has occurred in the past two years, when all scores except those for precipitation were higher than in previous periods. A number of factors have contributed to this improvement, among them the use of high-speed computers for data processing and analysis and the development of some new objective forecasting procedures.

One of the Section's research projects is to relate the long-range circulation patterns to prediction of seasonal distribution of temperature departure from normal. Experimental seasonal outlooks are prepared four times yearly in an effort to find a satisfactory method. Results for the past two years have been encouraging.

Other projects under way include a study of atmospheric energy sources; a study of the effect of the earth's surface on circulation; statistical studies relating temperature, rainfall, and pressure of one season to another; the improvement of operational models for the IBM-7090 computer; experiments with empirical methods of improving current forecast procedure; a study relating the origin and paths of hurricanes to circulation; and work on statistical methods of forecasting circulation patterns. Scientists in the Section are also working on the improvement of objective methods of forecasting precipitation and temperature.

The Section is an operational and research laboratory in which meteorologists on temporary assignment may experiment with applications of extended forecast techniques to their specific problems. The facilities are available to visiting members of the meteorological and allied professions and are frequently used by foreign meteorologists studying U.S. Weather Bureau practices.

The Extended Forecast Section has a unique collection of historical and contemporary data suitable for statistical or dynamical studies, particularly those concerned with general circulation and long-range forecasting. These are made available to many domestic and foreign institutions, both governmental and private, thereby increasing the research service potential of the National Meteorological Center.



Jerome Namias, Chief of the Extended Forecast Section, compares numerically predicted monthly mean circulation with maps of the observed circulation in previous years.

Closed Circuit Television Used by Bureau For Pilot Weather Briefing at Idlewild

The Weather Bureau is now operating a closed circuit television system at New York International Airport to provide weather briefings for international flights. Similar systems will soon be in operation at Miami International Airport and at the Weather Bureau Airport Station in San Juan.

Pilots and crews can obtain a complete weather briefing at their own convenience by visiting the TV briefing facility, where a continuous map display and discussion is always in progress. The television monitor at New York International Airport is in the Weather Bureau Briefing Office in the International Arrivals Building. The map displays, cameras, and transmitters are located in the International Aviation Forecast Section, about one mile from the Briefing Office.

The Bureau is encouraging airlines to install their own monitors for even greater convenience. Airlines wishing to do so will be required to provide their own receivers and to bear the cost of necessary cable connections.

The televised briefing consists of a series of weather charts, accompanied by the taped commentary of a Bureau forecaster. The charts used in the New York briefings depict the anticipated wind and weather conditions at levels from the surface to approximately 45,000 feet, covering the major international routes. The briefings are changed every six hours and can be modified more often as conditions make it necessary.

The New York briefings are subdivided into two areas. The first portion is directed at flights departing for the Canadian Maritimes, Iceland, Western Europe, and the Azores; the second is tailored for flights to Bermuda, the Caribbean, and Central and South America. For the second portion of the briefing, charts are prepared by the Miami forecast unit and transmitted to Idlewild by facsimile.

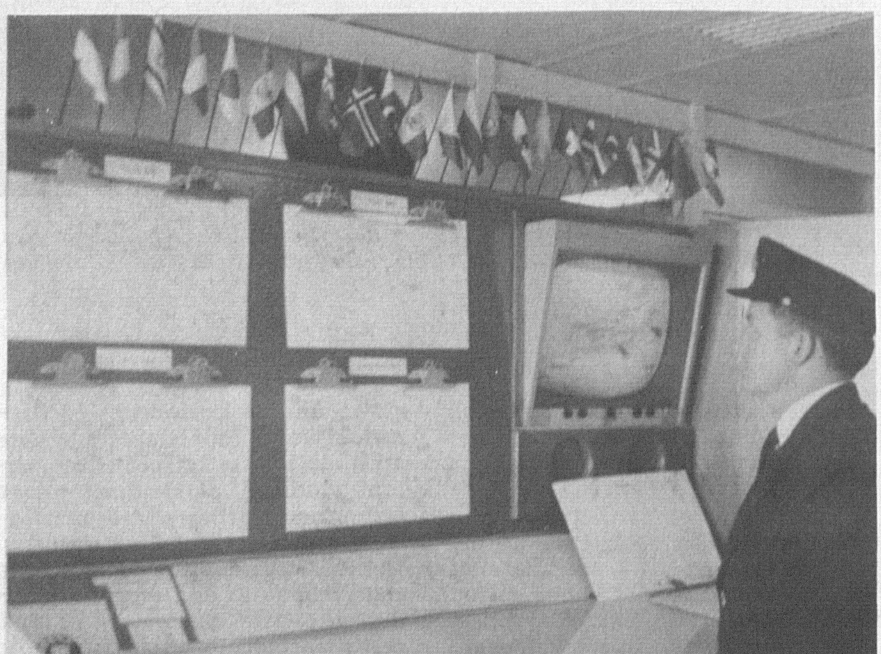
When preparing a briefing for use on closed circuit TV, the pilot briefer first places the pertinent weather maps in a display mechanism that holds the charts in the television camera's field of view. The briefer makes a tape recording describing the meteorological conditions associated with the first chart. He then pushes a button causing the next chart to appear in the camera's view. At the same time, a signal is recorded on the magnetic tape which will change the charts when the briefing is automatically rerun later.

When all the charts have been shown and the commentary taped, an "end of sequence" signal is recorded and the machine is set for automatic rerun of the entire sequence.

Charts can be removed from the sequence and new ones inserted with a new recorded message, when changing weather makes it necessary.

The equipment was designed and manufactured for the Weather Bureau by General Precision, Inc., of Pleasantville, New York.

The televised briefings will aid both fliers and forecasters. Some pilots, in the past, have had to depend on telephone descriptions of weather charts. Now they will be able to see the charts themselves. The aviation forecaster can now reach a larger pilot and dispatch audience with a single briefing and will be free to devote more time to analysis of new weather developments.



Dennis Gaffney, of the BOAC Traffic Section, watches a closed circuit TV weather briefing at New York International Airport.

Bureau Employees Receive Commerce Medals

On February 14, 1961, Secretary of Commerce Luther H. Hodges awarded three Gold and seven Silver Medals to Weather Bureau employees. The medals were presented at the Thirteenth Annual Awards Program at the Department of Commerce auditorium in Washington, D.C.

In the same ceremony, 13 Weather Bureau employees were honored for 40 years of service.

Gold Medals

The Gold Medal, the Department's highest award, is given to employees who have rendered some exceptional service to the Department.

George P. Cressman

Dr. George P. Cressman, Director of the National Meteorological Center, received a Gold Medal for "outstanding accomplishments in the field of meteorology, highly distinguished authorship, and for exceptional leadership of the National Meteorological Center since its establishment in 1958."

As Director of the National Meteorological Center, Dr. Cressman is responsible for the programs of the Extended Forecast Section, the National Weather Analysis Center, and the Joint Numerical Weather Prediction Unit. He coordinates the operational output of the entire Center and directs its research and development policies. In addition, he has published many articles dealing with automatic procedures for analyzing and forecasting the weather.

Dr. Cressman was among the first to recognize the potential value of electronic computing equipment to meteorology and has been one of the most aggressive proponents of numerical weather prediction using high-speed electronic computing systems. His initiative and persuasiveness played an important part in the decision to establish the Joint Numerical Weather Prediction Unit, which was organized in 1954. Under his guidance this special forecast unit, sponsored jointly by the Weather Bureau, Air Force, and the Navy, pioneered in the field of operational forecasting procedures by numerical weather prediction methods.

The Air Force's Exceptional Civilian Service Award was given to Dr. Cressman in 1955 for his work in organizing the Joint Numerical Weather Prediction Unit.

William F. Johnson

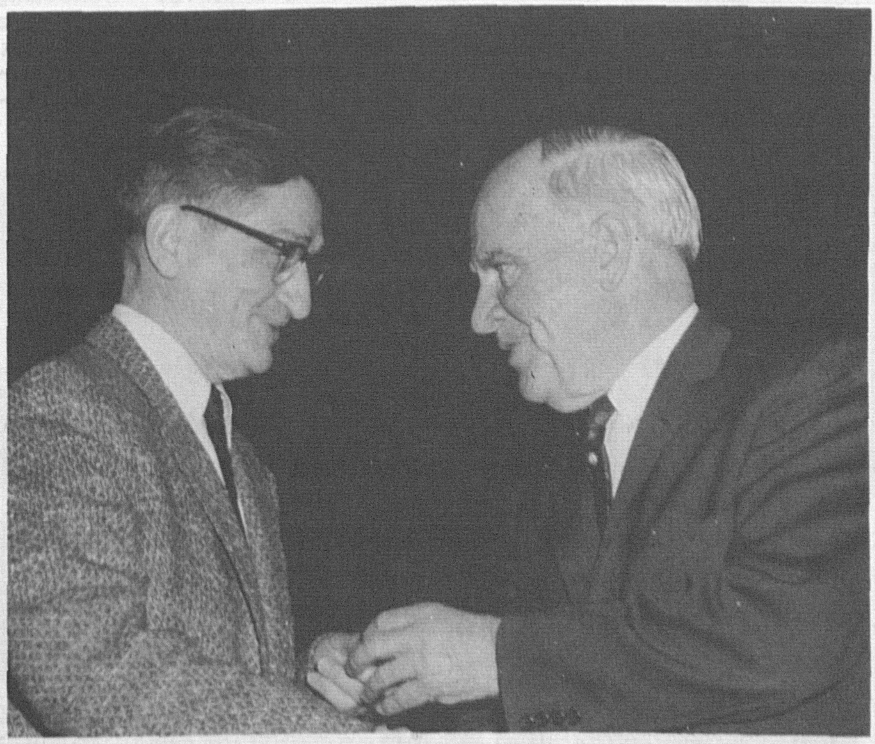
The Gold Medal for Exceptional Service was awarded to William F. Johnson for "outstanding resourcefulness and initiative in conducting an important meteorological program at Ellsworth Station, Antarctica, under exceedingly adverse conditions."

Mr. Johnson went to Antarctica in January 1959 as Supervisory Meteorologist at Ellsworth Station, which was operated by Argentina.

Early in the Antarctic winter, a fire destroyed the inflation shelter and damaged the hydrogen generator. In a time of almost total natural darkness, with temperatures reaching below -60° F., Mr. Johnson managed to repair the hydrogen generator, build a new inflation shelter, and continue the observation program. His interest and pride in maintaining the program in spite of extreme difficulties, his ability to plan, direct, and participate in the rebuilding and repair of his facilities, resulted in the accumulation of valuable meteorological data which otherwise would have been lost.

In January 1960, Mr. Johnson was scheduled to return from the Antarctic. Because of extremely heavy ice conditions, the resupply ship had to turn back when it was within 150 miles of Ellsworth Station. Mr. Johnson was forced to spend another year in the Antarctic, the only United States representative on the station.

Mr. Johnson then asked the Central Office for help in plan-



Ernest T. Wettrich, of the Central Office Printing Section, receives his 40-year length-of-service award from Secretary Hodges.

William F. Johnson

ning useful programs that could be carried out during the next year, using the resources at hand. His work added much to our knowledge of the little-known continent of Antarctica.

Mr. Johnson entered the Weather Bureau in 1949 and has been stationed at Washington, D.C.; Wake Island; Memphis, Tennessee; and Mobile, Alabama. In addition, he has spent one year with the Weather Bureau's Polar Operations in the Canadian Northwest Territory and a year in the Antarctic during the International Geophysical Year.

Reinhart C. Schmidt

Reinhart C. Schmidt, Chief District Meteorologist at Washington, D.C., received the Gold Medal for his outstanding contributions to the public service.

Under Mr. Schmidt's direction, the Washington forecast center provides guidance forecasts to Weather Bureau offices serving the Middle Atlantic states, international aviation forecasts for transoceanic flights and aviation forecast service for several states including one of the Nation's busiest airports, marine forecasts for the western North Atlantic area, and severe storm and hurricane warning services for the Middle Atlantic states. As Chief District Meteorologist, Mr. Schmidt provides technical leadership to Weather Bureau staffs in an eight-state area.

During the 15 years in which Mr. Schmidt has been in charge of the Washington forecast center, a number of studies have been undertaken which have resulted in improved forecasting techniques. Some of these have been conducted by Mr. Schmidt personally and others by members of the staff under his guidance.

Mr. Schmidt has published several papers on forecasting precipitation and cold front passages in the Washington forecast area.

In 1955, Mr. Schmidt received the Department of Commerce Silver Medal for Meritorious Service in recognition of his leadership and important contributions to the science of meteorology.

Silver Medals

Silver Medals for Meritorious Service were awarded to six individual employees and one group.

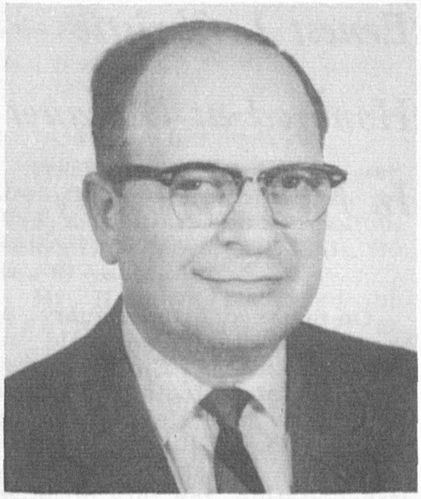
Lake Michigan Seiche Forecast Group

A Group Meritorious Service Award was presented to six employees "for a valuable contribution to technology in developing techniques for seiche forecasting in Lake Michigan and unusual competence in issuing a seiche warning on August 3, 1960, which prevented heavy loss of life."

The recipients were Joe R. Fulks, Clifford D. Hall, Paul H. Swope, and Lawrence A. Hughes, of the Weather Bureau Forecast Center in Chicago; Ivan W. Brunk, of the Weather Bureau Office in Chicago; and D. Lee Harris, of the Office of Meteorological Research, who accepted the award for the group.

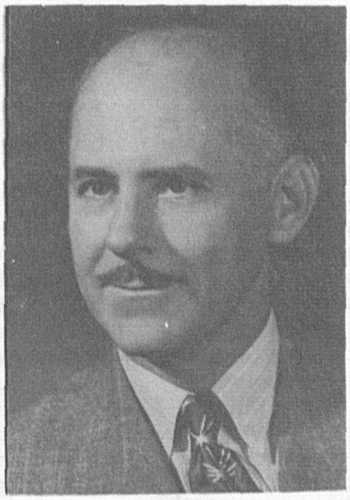
Reinhart C. Schmidt

George P. Cressman



Samuel Smith

Samuel Smith, Administrative Officer of the Regional Administrative Office in New York, received a Silver Medal "for extremely competent performance over a long period of time, with particular reference to outstanding execution of duties as Administrative Officer in the Weather Bureau Regional Office at New York."

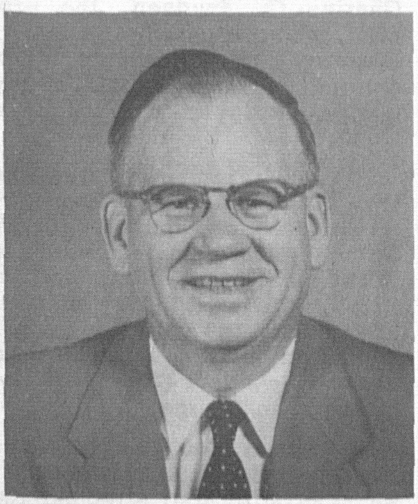


E. Wilbur McCollum

E. Wilbur McCollum, Shipboard Supervisory Rawinsonde Specialist with the Atlantic Weather Patrol, based at Norfolk, Virginia, received a medal "for important contributions to the Weather Bureau's Ocean Weather Program through extremely competent performance of official duties and an outstanding record of dependability and resourcefulness over a period of fourteen years."

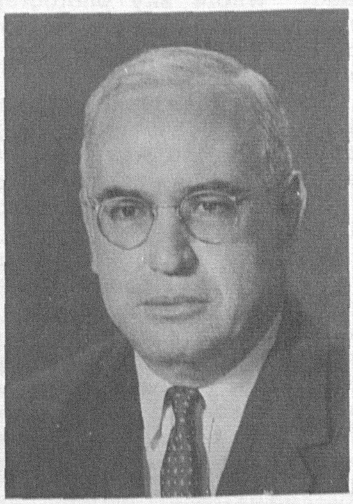
Donald H. Pack

Donald H. Pack, Research and Development Meteorologist, Office of Meteorological Research, was cited for "important contributions to the Weather Bureau's work in micrometeorology, particularly in the application of meteorology to the requirements of the nuclear energy field and to the solution of air pollution problems."



Warren O. Johnson

Warren O. Johnson, Meteorologist in Charge, Weather Bureau Office, Lakeland, Florida, received a Silver Medal "for outstanding contributions to the public service through excellent management of the Florida Fruit-Frost Service for the past seventeen years."



John W. Hayes

John W. Hayes, Official in Charge of the Weather Bureau Airport Station at Fort Myers, Florida, was cited "for outstanding service to the public and unusual courage and competence at Fort Myers during hurricane Donna on September 10, 1960."

Norman A. Matson

Norman A. Matson, Chief of the Emergency Warning Section, was honored for his "valuable contributions to the public service in the field of hurricane, tornado, and severe storm warning service."

TIROS II Cameras Still Working; Many Special Observations Made

TIROS II, our second weather satellite, has been in operation longer than its predecessor, TIROS I. The cameras in TIROS I functioned from April 1 to June 17; TIROS II was launched on November 23 and is still taking photographs and transmitting radiation data.

The wide-angle camera in TIROS II is not functioning properly. In late February, the narrow-angle camera took photographs in the Southern Hemisphere which were useful in determining the attitude of the satellite.

During the first part of March, when TIROS will again be making photographs in the Northern Hemisphere, it is anticipated that nephanalyses may again be transmitted.

Since its launching, more than 15,000 photographs have been received from TIROS II. 373 nephanalyses, based on the cloud photographs, have been prepared. Most of these have been sent to forecasters for appraisal of their value in weather prediction.

The cloud analysis charts were sent over the new National Weather Facsimile Network to about 650 government, military, and commercial receiving stations in 330 cities in the United States and southern Canada. They were also transmitted over other civil and military facsimile circuits and by radiofacsimile.

Nephanalyses were sent to the International Antarctic Analysis Center in Melbourne, Australia, for support of the annual resupply mission in Antarctica. The IAAC reported that the cloud maps were a great aid in improving and extending their southern ocean analyses.

The TIROS photographs were compared with conventional observations from many sources. Weather Bureau personnel in field offices and aboard marine vessels put special emphasis on cloud observations made at the times that TIROS passed. Radarscope photographs were used for comparison with TIROS II photographs. Pilot reports of weather conditions coinciding with TIROS II orbital passes are being gathered for review by weather satellite experts.

From January 7 through January 19, 1961, special upper-air radiometersondes were released from thirteen Weather Bureau stations for comparison with TIROS II solar and infrared radiation data. The radiometersondes are standard radiosondes modified to include radiation-sensing equipment.

The Geophysics Research Directorate of the Air Force installed hemispheric mirrors and cameras at Worcester, New Bedford, and Woods Hole, Massachusetts, and at Hartford, Connecticut, to take horizon-to-horizon cloud pictures from the ground as TIROS passed overhead. Whole sky photographs were also made by the Meteorological Satellite Laboratory at Suitland, Maryland.

High altitude photoreconnaissance planes, operated by the Air Force on the west coast and the Navy on the east coast, cooperated by making special flights.

The Navy's Light Photographic Squadron 62, based at Cecil Field, Florida, photographed the satellite's track over the ground from an altitude of 50,000 feet. Using three cameras, the photos cover horizon-to-horizon along the flight path. Each mission covered a portion of the satellite's path about 400 to 500 miles long. These photographs were taken within ten minutes of the time TIROS passed overhead.

Because the quality of the wide-angle pictures from TIROS II has not been as good as those from TIROS I, it was decided to wait for the launching of a third TIROS satellite later in 1961 to implement a full-scale international observation program.

Ernest J. Christie Honored at Banquet In New York City

On the second of February, a testimonial dinner was held in honor of Ernest J. Christie, the retiring Meteorologist in Charge of the New York Weather Bureau Office. Nearly 200 representatives from industry, commerce, transportation, the city government, press, radio, and television gathered to honor Mr. Christie.

The dinner was held in the Rainbow Grill on the top of the RCA Building, in which the Weather Bureau offices have been located since the beginning of the year.

Lloyd Brotzman, Regional Administrative Officer, served as toastmaster, and the speakers included James W. Osmun, Deputy Chief of the Bureau, and Charles G. Knudsen, the new MIC, who presented gifts to Mr. Christie from his friends. Tex Antoine spoke in behalf of industry, particularly communications.

Mr. Christie entered the Weather Bureau in 1930 as a Junior Observer at Rapid City, South Dakota, after teaching school in North and South Dakota for five years. He was later stationed at Kansas City, Hartford, Conn., and Albany, N.Y. In 1949, he went to New York City as Meteorologist in Charge.

A graduate of Hamline University in St. Paul, Minnesota, Mr. Christie also attended the State Teachers Colleges of North and South Dakota. He is a member of the American Meteorological Society and a Fellow of the New York Academy of Sciences.

After his retirement from the Weather Bureau, Mr. Christie will be a consultant for radio and television. His home address is 511 Pine Acres Boulevard, Brightwaters, New York.

Frank E. Hartwell

Frank E. Hartwell, who retired from the Weather Bureau in 1935, died at his home in Bolton, Vermont, on January 19, 1961. He was 87 years old.

Mr. Hartwell entered the Weather Bureau in 1897 at Lincoln, Nebraska, and later served at various stations in Florida and Cuba. His last two assignments were as Official in Charge at Burlington, Vermont, and San Juan, Puerto Rico. After his retirement, he served as an unpaid observer for the Burlington River District Office.

In the years immediately following his retirement, Mr. Hartwell operated a printing business in Bolton and taught meteorology at the University of Vermont.

At the age of 80, Mr. Hartwell was elected Town Representative and served in the State legislature at Montpelier. At 84, he wrote and published a book, "Forty Years of the Weather Bureau," setting the type by hand and printing the book one page at a time on an old foot-power press.

Just before his death, Mr. Hartwell served as a delegate to the White House Conference on Aging.

He is survived by his wife, Mrs. Florence Hartwell; a daughter, Mrs. William Thorp, of the Virgin Islands; a son, Ralf, of Cranford, New Jersey; and seven grandchildren and eleven great-grandchildren.

Alvin Y. Gardner

Alvin Y. Gardner, a photographer in the Central Office Printing Section, died on December 24, 1960. Mr. Gardner came to the Weather Bureau in June 1959 after eleven years with the Coast and Geodetic Survey. He had served in the Army from 1941 to 1946 and from 1948 to 1950. Mr. Gardner is survived by his wife and three daughters, who live at 600 Johnston Place, Alexandria, Virginia.

Calls to WEather 1212 Top 204 Million in 1960

In the 11 cities where recorded weather forecasts are available to those who dial WEather 1212, over 204 million calls were recorded in 1960. This is a drop from the 1959 peak of over 206 million calls. However, a new record high day was established at New York City on March 3, 1960. 446,252 calls for weather information were made on that day, when snow and rain threatened the city.

The 1960 daily average for all installations was 50,844 calls.

City	Annual Total	Highest Day	Highest Date	Monthly Average	Daily Average
Baltimore	12,082,100	168,385	March 16	1,006,842	33,011
Boston	6,181,189	134,180	March 3	515,099	16,887
Chicago	24,250,080	246,069	Sept. 8	2,020,840	66,257
Cleveland	25,139,759	188,653	March 16	2,094,980	68,688
Detroit	30,910,559	193,255	Sept. 1	2,575,880	84,455
Milwaukee	14,476,221	91,772	Sept. 8	1,206,352	39,553
New York City	34,408,903	446,252	March 3	2,867,409	94,013
Philadelphia	17,013,687	202,250	March 3	1,417,807	46,485
Pittsburgh	10,065,150	93,817	March 3	838,763	27,500
San Francisco	4,369,566	51,802	June 2	364,131	11,939
Washington	25,817,758	287,480	March 9	2,151,480	70,540
TOTAL	204,714,972				559,328
DAILY AVERAGE					50,844

Positions Still Available In Bureau's Antarctic Program

Applications are still being accepted for Antarctic assignments (see Vacancy Announcement 61-50).

The U.S. Government, through the National Science Foundation and cooperating agencies such as the Weather Bureau, is supporting an active national research program in Antarctica (see Feb. TOPICS, pp. 28-29). This is an important part of the coordinated international scientific investigation of Antarctica, which is concentrated mainly in the geophysical sciences. The research effort is a continuation and expansion of what was done during the International Geophysical Year and International Geophysical Cooperation. The Weather Bureau conducts a meteorological observing program and a program of Antarctic research using data from the observing program.

In view of the great scientific importance of the program and the various opportunities it affords, all qualified Weather Bureau employees are urgently requested to give serious thought to applying for an Antarctic assignment. Every effort will be made to return Weather Bureau status employees to the stations of their choice. Application should be made in accordance with Vacancy Announcement No. 61-50.

Welcome to the Weather Bureau

Lillian L. Bankhead, Card Punch Operator, San Francisco
Bruce Orrin Barnes, Met. Tech., North Platte, Nebraska
Shirley Rae Basel, Clerk-Typist, Central Office
Emogene Blake, Teletypist, Denver, Colorado
Bonnie A. Bradley, Card Punch Operator, San Francisco
Julia Lucille Cohen, Clerk-Typist, Central Office
La Vonna J. Dollar, Met. Tech., San Francisco
Amet Figueroa, Met. Tech., Anchorage, Alaska
Helen S. Flippin, Accounting & Fiscal Clerk, Fort Worth
Gene Wallace Geil, Meteorologist, Central Office
Ann H. Gilbert, Card Punch Operator, Chattanooga
Marion E. Hess, Clerk, Central Office
Warren Jules Jacob, Meteorologist, Detroit
Marjorie C. Juliano, Clerk-Stenographer, New York
Tatsuo Kobayashi, Met. Tech., Wake Island
Robert Paul Krebs, Meteorologist, Kansas City
Donna Jean Larson, Clerk-Stenographer, Lansing, Michigan
Robert Alfred Laudrille, Meteorologist, Central Office
Charles M. Lennahan, Meteorologist, Central Office
Helene S. Mayes, Secretary, Central Office
Yvonne S. McKinney, Clerk-Typist, Central Office
James A. Mitchell, Met. Tech., Tatoosh Island
Francis X. Oxley, Photographer, Central Office
Richard C. Peck, Electronic Technician, Sterling, Va.
Paul M. Richards, Met. Tech., Anchorage
Lorna M. Ridley, Meteorologist, Anchorage
William Paul Schultz, Met. Tech., Chicago
Raymond T. Terada, Met. Tech., Johnston Island
Gene T. Triplett, Budget Analyst, Central Office
Major Freeman White, Warehouseman, Central Office
Ivan T. Winterberg, Met. Tech., Washington, D.C.

Transfers

	from	to
Protasio M. Actouka	Ponape	Truk
John C. Anderson	Lincoln, Nebr.	Duluth
Alfonso Castaneda	San Francisco	El Paso
Richard N. Cook	Huron, S. Dak.	Des Moines
Herbert D. Crawford	Kansas City	OCDM Main Relocation Site
Robert E. Daniels	Cordova	Barrow, Alaska
James Leo Doherty	Davisville, R.I.	Central Office
John O. Ellis	Cambridge, Mass.	Central Office
Roy L. Fox	Asheville	Kansas City
William F. Frank	Springfield, Mo.	Port Arthur, Tex.
Donald A. Haines	Madison, Wis.	Central Office
Frederick C. Hochreiter, Jr.	McGrath, Alaska	Juneau
Leonard C. Jones	McGrath, Alaska	Los Angeles
Donald L. Keller	Arctic Drift Station	Suitland
Milton R. Lefebvre	Minneapolis	Kansas City
Verdin E. Liddell	Barrow	McGrath, Alaska
Robert J. McCann	Charleston, S.C.	Sterling, Va.
James E. McCarthy	Antarctica	Boston
Clair D. Mills	Chicago	Kansas City
Wesley R. Morris	Grand Rapids	Antarctica

Forecasters' Forum

The most important forecast to reach the public in this area is the one that reaches the listener at the breakfast table, between 6 and 8 a.m. It is the forecast that is formulated at 4 a.m. that day. Unfortunately, it appears to be the forecast that receives the least attention. Major changes are frequently made at the 10 a.m. forecasts, changes that should have been anticipated at 4 a.m.

It is the suggestion of this office that major emphasis in the official forecasts be shifted from 10 a.m. to 4 a.m., and to implement this shift, that the official verifications be based on the 4 a.m. forecasts.

C.E. Lamoureux, MIC
WBAS, Des Moines

Correction: The author of the article, "Computing the Mean Daily Temperature and Degree Days," which appeared in Forecasters' Forum for January 1961, was Edward Lazar and not Edwin S. Lazar as indicated.

Mirror Aids in Reading Theodolite Azimuth Scale

As a result of two simultaneous employee suggestions, a mirror has been procured which clips over the dust cover of the theodolite azimuth scale. This facilitates reading the scale, but it does have one slight disadvantage in that the image is inverted. This could be corrected by using a prism, but the greater cost and limited space available make this impractical. The mirror does not interfere with the normal use of the cover. Approximately 100 of these mirrors have already been installed on theodolites as they were reconditioned. Stations desiring one before the reconditioning period may direct their requests to the Central Office, Attention IED.

Length of Service Awards

35-Year Award

Alfred B. Tugman,
Adm. Ops. Central Office

30-Year Award

John M. Cohen,
WBAS Boston

25-Year Awards

Hazel G. Brown,
Instr. Eng. Central Office
Sigmund Fritz,
OMR Central Office
Oliver W. Hunn,
WBO Houston
Pearl Mangum,
Adm. Ops. Central Office
Frederick K. Oplinger,
WBAS Cleveland
William F. Selfridge,
WBAS Boise

15-Year Awards

Renato Bisagni,
OMR Central Office
Warren L. Boyer,
RRC Joliet
George E. Bradley,
WBAS Mobile
David S. Durst,
WBAS Seattle (Sea-Tac)
Charles O. Farris,
F&SR Central Office
Earl H. Gillette, Jr.,
AWP New York
Robert E. Lindstrom,
San Juan, P.R.
Nan C. Ofenloch,
NSSP Kansas City
Cecil M. Palmer,
WBAS Wilmington, N.C.
Byron B. Phillips,
PSL Central Office
Delbert W. Porter,
WBAS Columbia, Mo.
Margaret L. Robinson,
WBAS Akron
Daniel A. Schlichtig,
WBAS Burbank
Walter L. Slansky,
WBAS Scottsbluff, Nebr.

Meteorological Readings

(Note: The number of the January assignment should have been XLIV. The February assignment should have been numbered XLV.)

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate.

Assignment XLVI: Rainstorm in Southern Florida, January 21, 1957, by Robert H. Sourbeer and R. Cecil Gentry, *Monthly Weather Review*, Volume 89, Number 1, January 1961.

About the Assignment: This article emphasizes the intimate relationship between vertical motion and rainfall. Obviously the forecaster who cannot foresee the convergence, vertical motion, and divergence processes described here is confronted with a formidable handicap.

QUESTIONNAIRE

Col. 61 After the smaller showers departed from the main cell of the rainstorm they were observed to
1. intensify
2. weaken
3. remain unchanged
4. reenter main cell and reinforce it.

Col. 62 The main cell of the rainstorm moved from
1. east to west
2. west to east
3. north to south
4. south to north

Col. 63 Pilots flying over southern Florida would have been able to top much of the clouds at what altitude?
1. 12,000 feet
2. 8,000 feet
3. 30,000 feet
4. 10,000 feet

Col. 64 The 250 mb. isotach maximum during the first few hours of heavy rainfall was oriented along a line from
1. West Palm Beach to Miami
2. West Palm Beach to Tampa
3. West Palm Beach to Fort Myers
4. Miami to Tampa

Col. 65 What, approximately, was the 2000 ft. wind velocity at West Palm Beach during the first few hours of heavy rainfall?
1. WNW 58 3. ESE 25
2. ESE 31 4. ENE 22

Col. 66 All of the showers in this rainstorm moved from
1. west to east
2. east to west
3. north to south
4. none of the above

Col. 67 The shape of most of the streamlines and contours in the troposphere near the storm was
1. cyclonic or straight
2. anticyclonic or straight
3. strongly cyclonic
4. strongly anticyclonic

Col. 68 According to the authors, this contributory factor was important in confining the heavy rainfall to the area between Okeechobee and West Palm Beach:
1. Great difference between lake and air temperatures
2. Diurnal range of temperature
3. Relative position of land, ocean, and lake in relationship to low level winds
4. Increased friction over water areas

Col. 69 What method, independent of divergence computation, was used to infer ascending motion?
1. Study of vertical wind shear
2. Study of temperature changes at fixed levels
3. Study of katallobars
4. Study of perturbations in sea level isobars (easterly waves)

Col. 70 The authors believe the clue to the cause of the rain can be found in
1. wind speed field
2. curvature of isobars
3. presence of sea level lows
4. convergence aloft and divergence at sea level

CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

WEATHER BUREAU TOPICS

Volume 20 APRIL 1961

UNITED STATES DEPARTMENT OF COMMERCE
WEATHER BUREAU

Topigrams

Washington, D.C.
April, 1961

Direct picture-taking by TIROS II began again during the second week of March. The quality of the wide-angle photographs was considerably improved, although still inferior to that of TIROS I pictures. A few nephanalyses were prepared and sent on the national facsimile circuits, some within three hours after the pictures were taken. A special series of narrow-angle photographs was made over the Gulf of St. Lawrence in conjunction with Navy photographic flights from Newfoundland. These photographs were of extraordinarily good quality.

The first session of the WMO's Commission for Hydrological Meteorology was held in Washington from April 12 to April 26. Max Kohler, the Bureau's Chief Research Hydrologist, is President of the Commission.

The Regional Administrative Officers met in the Central Office during April to review Weather Bureau policies and coordinate Regional Office activities. The conference was attended by all Regional Administrative Officers and the MIC, Pacific Supervisory Office.

The Tokyo center of the Northern Hemisphere Exchange is now in operation, thus completing the chain of point-to-point radioteletypewriter and landline teletypewriter links around the Northern Hemisphere. The New York, Offenbach, Moscow, and New Delhi centers began operation in October 1960 (see TOPICS, September 1960, page 145).

With the issuance in March of Climates of the States for Hawaii, this series is complete for all of the States. Only one issue, Puerto Rico and the Virgin Islands, remains to be published.

Arrangements have been made to provide Curacao, Netherlands West Indies, with forecasts for jet aircraft departing for Lisbon. San Juan and Idlewild will each supply a portion of the forecast. Arrangements have also been made to provide forecast service for the new jet route between Los Angeles and Tahiti. The United States will supply the forecast for the area north of the Equator.

S.R. Barbagallo of F&SR, Chairman of the WMO Region IV Working Group on Telecommunications, attended two meetings in Paris during April. One was a meeting of a Special Working Group from Region VI, where the improvement of communications between Regions IV and VI was discussed. The second was a meeting of the Commission for Synoptic Meteorology's Telecommunications and Working Group, of which Mr. Barbagallo is Region IV and U.S. representative.

Briefs from the CO Staff Conferences

The status of the proposed new Weather Bureau headquarters was reviewed by Mr. Kvam. The General Services Administration estimates that a new Weather Bureau building could not be included in its budget for three or four years and, after approval of the building plan, another four or five years would be required for completion of the building. This would mean a minimum waiting period of seven to nine years for a new plant. As an alternative, the Bureau was asked to consider the Bureau of Standards site, which will be available in about three years. A group of the present Standards buildings, totaling about double the amount of space the Bureau now occupies, would be completely refurbished for our use. It was agreed that the Weather Bureau should recommend use of the Bureau of Standards site, and this recommendation has been approved by the Under Secretary of Commerce for Transportation.

Division Progress Reports:

1. Hydrologic Services

The problem of effective hydrologic use of the new WSR-57 radars has been under recent discussion with other offices and divisions involved. The use of radar meteorologists for other than radar duty was mentioned. The immediate step that needs to be taken is the preparation of a policy letter making clear the hydrologic obligations at these radar stations. A draft letter is being prepared by Mr. Rockney.

The new program in prospect in the President's amended budget is in the field of hydrologic research, with special effort directed toward better evaluation of both precipitation and evaporation, the investigation of the use of computers in data analysis and flood forecasting, and the potential application of meteorological satellite photographs to the hydrologic problem, particularly snow cover.

2. Polar Operations

Mr. Dyer reported great difficulty in recruiting physicists and meteorologists for the Antarctic program and expressed concern for some of the planned projects unless the recruitment problem can be overcome.

3. Office of Climatology

Mr. Schloemer discussed the variations of new climatological normals from previous ones, caused by changes in instruments and actual observation points. This is a serious problem that should be given further study in conjunction with the benchmark station network. It has been referred to the Office of Planning for consideration.

Editorial

Our Professional Standards

In a "Letter to the Editor" that appears on the opposite page, two Weather Bureau employees pose a difficult question of personnel policy. They ask why they have lost their meteorologist ratings, when "old timers" have not. This is a valid question and one that affects many employees.

The personnel administration of the Bureau has spent much time over many years seeking the best and most equitable solution to the problem raised by Mr. Gouldie and Mr. Benton in their letter.

The raising of qualifications and standards for meteorologists in the Weather Bureau was inevitable and unavoidable. By raising the standards, we have been able to obtain higher grades for our employees. These higher grades are based on academic and professional qualifications comparable to those required in physics and in other fields where scientific grade levels have been established.

When an organization raises its standards, it obviously cannot vacate all of the positions filled by personnel who have carried on its work through the years. In practice, the only way to administer a change to higher standards is to impose those standards on personnel entering the organization after a certain date. When such an action is taken, any hardships involved necessarily fall more heavily on newer employees.

After World War II more than 6000 men who had received professional training in meteorology in the service entered the labor market. Many were hired by the Weather Bureau. When a large group of people are competing for a limited number of positions, the qualifications are raised. This is true in any occupation. Thus it happens that the younger employees, hired after World War II, are required to meet standards which are not fulfilled, at least so far as academic training is concerned, by older employees.

In order to be qualified as a meteorologist, an employee must have a certain minimum knowledge of the science of meteorology. Just as important, he must know how to apply this knowledge. There are some highly educated people who cannot do our work. On the other hand, many able people with a tremendous amount of meteorological knowledge have not had the benefit of much formal education. We try to measure an employee's professional knowledge and know-how by considering both his formal training and the recommendations of his superiors with respect to his ability.

There are, of course, other criteria for evaluating an employee's professional competence. Authorship of truly professional articles and papers is often evidence of an employee's knowledge. Professional membership in scientific societies and leadership in professional discussions provide further criteria. An employee who keeps abreast of--and uses--the latest methods and developments in meteorology indicates his professional caliber.

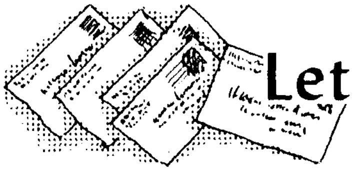
Over the years, the Bureau has strongly and regularly emphasized to all of its employees the necessity for acquiring more knowledge and skill in meteorology. When the standards were raised, the Bureau conducted a number of in-service training programs to enable employees to raise their qualifications. Articles have been published in TOPICS, special letters have been written, fanfolds have carried notations encouraging employees to take additional courses at the professional level, and officials traveling from the Central Office and the Regional Offices to the field have urged employees to enhance their opportunities for advancement through the completion of courses at the graduate level, membership and active participation in professional societies, and by private research and writing of technical papers. The response has been tremendous. I doubt whether any other agency in the government has such a high percentage of its employees so busily engaged in improving their qualifications.

Assistance is available for all types of employees -- scientific, administrative, managerial, etc. -- who seek further training in order to advance their careers. Such assistance may take the form of full-time university assignments or of financial aid for part-time residence or correspondence courses. This program is naturally limited by statutory regulations and the availability of funds. But it is the policy of the Bureau to aid employees who show the ability to profit from further training and who demonstrate, by undertaking to pay for at least part of their own schooling, a very strong motivation to develop themselves.

The only barriers to advancement are those which we erect for ourselves. Our personnel records are filled with examples of employees who accepted the realities of our professional requirements and took definite steps to meet them. Our records also show a great number of employees who have the ability to become professionals but have not made the necessary effort to do so.

There are often valid personal reasons why this is so. Personal obligations outside the office sometimes make it difficult to find time and money for professional improvement. Some employees choose to spend their spare time in family and community activities. This is a personal decision and the Bureau is not critical of those who make it. Those who make such decisions should recognize, and I am sure that most of them do, that the Weather Bureau is not a party to the decision. But, in doing so, they are establishing their own barriers to professional advancement.

F.W.R.



Letters to the Editor

Is There a Time Barrier?

We respectfully request that you publish this in your next issue of TOPICS.

There is no doubt that the following could apply to several hundred Weather Bureau employees who are caught in a similar situation, even though this letter is signed by only two employees.

We are of the group of Meteorological and Radar Technicians that gained early experience in Meteorology and limited schooling during World War II, and entered the Bureau shortly after the war was over. Since then we have taken some Meteorology, math and physics courses, but not enough to meet the requirements for meteorologist under the present increasing requirements. We passed an examination about ten years ago that the Weather Bureau sponsored and obtained the title of Meteorologist. A few years ago we lost our Meteorologist titles, and were changed to Technicians, continuing in the same work.

Yet there are others in the Bureau, often referred to as "Old Timers," that do not have the necessary qualifications, but still hold their titles as Meteorologist. Why? Most of us have performed work on a professional level for the past ten years.

Surely if one is qualified, why isn't the other, unless time in the Bureau is a qualification? If it is, what is the "Time Barrier," and when does one reach it?

Charles D. Gouldie, Meteorological Technician
and
Davis Benton, Radar Meteorological Technician

(See the editorial, "Our Professional Standards.")

Great Falls MIC Praises TOPICS

I have read nearly every issue of TOPICS since 1922 and can well appreciate its changes and evolution. Originally it was very official and very stuffy, composed of Instructions and Personnel Changes -- the latter always read every month with anguish by field employees. Today TOPICS is a most valuable means of communication, reporting on all the activities of the Bureau. The human element has been interjected. Every employee now has a new feeling of dignity from the pride he takes in the accomplishments of his co-workers learned from the pages of TOPICS.

Briefs from the CO Staff Conferences was one of the most worthwhile additions to TOPICS in recent times. It provides field employees with knowledge of problems facing the Bureau and just how well our leaders in the Central Office are meeting these problems.

I believe that the editorial page will be even more important as it will direct the thinking and action of every employee. It can be made to build an even stronger and more unified organization and to stimulate and inspire the individual. Thinking people do read editorials.

T.E. Jermin, Meteorologist in Charge
WBAS, Great Falls, Montana

The Weather Bureau's B-26 at Will Rogers Field, Oklahoma City. The IFF (Identification, Friend or Foe) radar can be seen at upper left, and to its right is the WSR-57. These radars are used as a team in air traffic control of the research planes.

The Roughrider Operations Unit in the National Guard Hangar at Will Rogers Field. At left are Norman E. Prosser, a Research Meteorologist with the NSSP, and a secretary.

National Severe Storms Project Begins 1961 Field Operations

This spring, the Weather Bureau's National Severe Storms Project is beginning what is probably the most comprehensive atmospheric investigation ever undertaken. The Federal Aviation Agency, the National Aeronautics and Space Administration, the Geophysics Research Directorate, the Wright Air Development Division, the Tactical Air Command, the Navy, and several university research groups are participating in the program with the Weather Bureau.

The goals of this research effort are to further our understanding of severe local storms and to develop procedures for minimizing their hazards. In addition, the Project expects to develop information which will help FAA improve air traffic control procedures in severe storm situations. NASA will be primarily concerned with Project findings on the character of turbulence and engineering data of importance in the design of aircraft structures.

To accomplish these purposes, the Project will collect information on the circulation and atmospheric energy processes which characterize the life cycle of individual squall line segments. It will attempt to isolate the atmospheric structures that explicitly foreshadow the development of severe local storms.

At Project headquarters in Kansas City, Director Clayton F. Van Thullenar, Chief Scientist Chester W. Newton, and the staff will plan the field operations and analyze the collected data. Policy matters and Central Office coordination will be handled by the Deputy Director of the Office of Meteorological Research, R.H. Simpson.

Each year, field operations will be conducted from Oklahoma City during the tornado season, nominally March 1 to June 15. Oklahoma City was selected as the most appropriate base because of the high incidence of squall line developments in that area. Investigations will be confined mainly to squall line segments which traverse a dense network of observing stations south of Oklahoma City. Thirteen aircraft, three radars, and the surface network will be used to gather extensive data on atmospheric structure and on the character of turbulence during the development of squall lines and tornado-generating conditions.

Aircraft operations supporting the NSSP are known as "Project Rough Rider." The four planes of the Weather Bureau's Research Flight Facility--two DC-6's, one B-26, and one B-57--will be used to gather data. Other planes participating in the program in 1961 are an A3D, two B-47's, a U-2, a C-130, three B-66's, and one F-106 penetration aircraft.

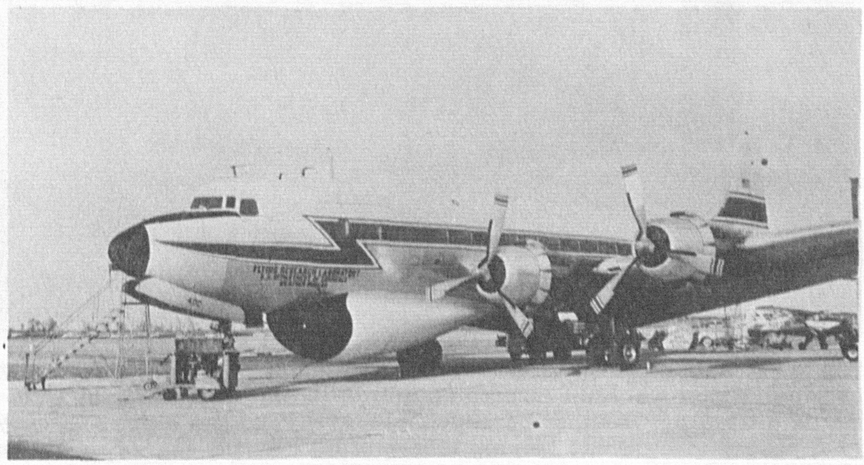
All of the Weather Bureau planes carry time-lapse movie equipment and instruments for measuring temperature, humidity, and wind direction and speed. The DC-6's also have instruments for measuring the liquid water content of the air, icing, altitude, pressure, and D-value. The information gathered by the instruments on the DC-6's and the B-57 is automatically put into digital form and transcribed onto magnetic tapes for use in an electronic computer.

Aircraft from other agencies are primarily instrumented for turbulence measurement, although some have Doppler navigation and basic meteorological probes.

A typical operation will involve several aircraft, each flying a given pattern. The planes will be controlled from the Weather Bureau's WSR-57 radar set at Will Rogers Field. FAA controllers will maintain the necessary separation for all aircraft on instrument flight rules within 250 nautical miles of Oklahoma City. During penetration flights, controllers will work with radar meteorologists to direct the aircraft through the parts of the storm from which data are desired.

Three radars will be used to make surface observations: the WSR-57 at Oklahoma City; a CPS-9 at Tinker Air Force Base; and an FPS 6/10 Air Defense Command radar.

Ground and airborne radar observations will be coordinated with aircraft penetrations of



One of the Bureau's two DC-6's. The master radome houses the doppler radar navigation equipment, the APS-20 search radar (weather), the APR Mark IV absolute altitude radar, and the SCR-718 absolute altimeter.

thunderstorms, permitting a comparison between the radar observations and the phenomena experienced by the aircraft. This program should allow a determination of the distribution of turbulence and hail in the radar echo and the relationship of this distribution to radar presentation.

Three concentric, increasingly dense networks of observing stations, centered in and around Oklahoma, will provide detailed surface data for the Project. The existing alpha network has stations spaced about 30 miles apart covering most of Texas, Oklahoma, and Kansas, and is expected to be expanded into eastern New Mexico and Colorado by 1965 or 1966. Pressure, temperature, humidity, and precipitation are automatically recorded at these stations. A beta network now being established between Oklahoma City and the Red River has stations spaced at about 15-mile intervals. In 1963-64, a gamma network will be added, with stations about five miles apart.

During the development and passage of severe weather regimes, hourly rawinsonde observations will be made at three selected stations bordering this surface network, and special six-hourly soundings will be made at five other stations near the Oklahoma border.

Two or three times during the season, all available facilities will be used to make a complete study of the development, maturity, and deterioration of a specific segment of a squall line. When a squall line is expected to develop, the Project will begin investigating the atmospheric structure in the area at least eight hours before the time of predicted development and will measure the progressive changes. When convection occurs, the probing effort will be concentrated on a squall line segment that is expected to pass over the surface observing network.

As many as twelve aircraft will operate simultaneously between the altitudes of 1,500 and 45,000 feet. The majority of these will measure the horizontal changes in temperature, pressure, humidity, and wind approaching the segment under investigation. Three or four of the better-stressed aircraft will fly through progressively more turbulent regions of the segment to obtain information relating the intensity of the radar return, as seen from the ground, to the actual turbulence experienced by the aircraft. Aircraft at higher levels will photograph the storm's development and observe changes in the large-scale weather pattern.

During several selected 24-hour periods, hourly pilot balloon observations will be made at 13 stations along an east-west line from Little Rock to Amarillo. These observations are expected to yield more knowledge of the structure and development of the low level jet stream.

At times during the season, the aircraft may stage from Denver, Colorado, to investigate hail-producing systems in that area, in collaboration with the surface hail-collecting network operated by Colorado State University.

The field operations of the Severe Storms Project are expected to require from five to seven years. In 1961 and 1962, exploratory investigations will be made and preliminary hypotheses tested. A model will be formulated in 1963 and 1964. It is hoped that advanced aircraft equipment can be developed during this period for detection, analysis, and avoidance of turbulence and hail. In 1965, the results of the earlier investigations will be applied to the development of techniques for predicting severe storms. Exploratory experiments in modification of severe storms are scheduled for 1966.

The B-57 and a DC-6 of the Bureau's Research Flight Facility were at Washington National Airport on March 10 for inspection by Commerce officials, Weather Bureau employees, and the press. Nearly 1000 people visited the "flying laboratories" during the day. Above (left to right) Clarence D. Martin, Jr., Under Secretary of Commerce for Transportation; Carl Reber, Director of the Research Flight Facility; R.H. Simpson, Deputy Director of the Office of Meteorological Research; Secretary of Commerce Hodges; and Dr. F.W. Reichelderfer inspect the DC-6.

Under Secretary of Commerce:

Edward Gudeman

Edward Gudeman has been appointed Under Secretary of Commerce by President Kennedy. The Under Secretary is the Secretary's principal deputy and has general supervision over the operations of the Department's bureaus and offices.

Mr. Gudeman was born in Chicago in 1906 and graduated from Harvard in 1927 with a B.A. degree. Immediately after graduation, he joined Sears, Roebuck and Company as a trainee. He was elected a director of the company in 1948 and became vice president in charge of merchandising in 1952. He resigned from his position as vice president in October of 1959, but remained on the Board of Directors.

In December 1959, Mr. Gudeman became a director of the Brunswick Corporation, a sports equipment concern. In 1960, he was made a partner of Lehman Brothers, the investment banking firm.

Mr. Gudeman was also a director of a furniture manufacturing company, a battery manufacturing concern, and an investment fund. He has now resigned from all his commercial affiliations.

In 1932, Mr. Gudeman married Frances Alschuler. They have two sons, Jon and Stephen, who are students at Harvard.

Executive Assistant to the Sec'y:

Paul A. Johnston

Paul A. Johnston, Executive Assistant to Secretary Hodges, is in charge of the administrative functions of the Department of Commerce.

Before joining the Department, Mr. Johnston was Budget Director for Burlington Industries. From 1955 to 1957, he served as Administrative Assistant to Governor Hodges and as Director of Administration for the State of North Carolina.

Mr. Johnston was born in Smithfield, North Carolina, in 1916. He attended public school in Smithfield and served with the U.S. Army from 1944 to 1946. He was graduated from the University of North Carolina Law School in 1952. While in law school, Mr. Johnston was Editor-in-Chief of the North Carolina Law Review. He is a member of the Phi Delta Phi legal fraternity, the Order of the Coif, the North Carolina State Bar, and the North Carolina Bar Association.

He is married to the former Miss Margaret Gainey McGirt and has one son, Paul A. Johnston, Jr.

New Center Near Boulder, Colorado Will Coordinate Atmospheric Study

The National Science Foundation last summer announced plans for the establishment of a National Center for Atmospheric Research. Dr. Walter Orr Roberts, formerly director of the High Altitude Observatory in Boulder, Colorado, has been appointed director of the new Center.

The establishment of the Center, which will be located near Boulder, Colorado, was proposed by the University Corporation for Atmospheric Research, of which 14 universities are members. The member universities are Arizona, California, Chicago, Cornell, Florida State, Johns Hopkins, Massachusetts Institute of Technology, Michigan, New York, Pennsylvania State, St. Louis, Texas A & M, Washington (Seattle), and Wisconsin.

The National Science Foundation plans to provide a basic core of financial support for the Center's operation and additional funds as required for major cooperative programs.

The Center's research and that of the Weather Bureau will be complementary and not competitive. The Bureau will continue to conduct a full program of meteorological research directed toward the accomplishment of its mission. The Bureau will keep closely in touch with the Center's work and will participate in some of its projects.

The Tenth Annual Report of the National Science Foundation (1960) explains the concept of the Center as follows:

"First, the Center will be an intellectual focal point where leading scientists with diverse backgrounds can concentrate their talents on atmospheric problems. Its personnel will include a permanent staff and an approximately equal number of visiting scientists from this country and all over the world. The Center will be interdisciplinary in character, bringing the resources of engineering, chemistry, physics, and mathematics to bear on atmospheric science. NSF looks to the Center to provide a bold imaginative approach to the vast problems of the atmosphere.

"Second, the Center will be a research-planning center for large-scale programs that cannot be undertaken by individual groups. The Foundation expects that the Center will use ad hoc teams of university scientists to plan such major programs. While providing an intellectual base to support major atmospheric research, the Center will in no way direct research in universities. Rather it will stimulate the planning of joint research-operations in which each group involved will participate according to its interests and talents.

"Third, the Center will be a research-operations center. For each cooperative research program undertaken, the Center will synchronize and coordinate the research operations, which may be of a world-wide nature. The Center will arrange for and schedule necessary airplane flights, rocket launchings, and other complex operations, serving as a scientific 'Combat Information Center' for each major program. In these operations maximum use will be made of existing Government facilities insofar as they can be made available by the responsible agencies.

"It is intended to let the facilities of the Center grow as the program develops and the needs become clear. Because its activities will be nationwide and probably worldwide, all facilities may not be located at a single place. Some of the necessary vehicle-launching sites for high-altitude balloons and rockets must of necessity have special locations. There will certainly be a central interdisciplinary laboratory and offices for the staff, but operational facilities may be widely dispersed."

Pilots Get Data Via Microwave

The Bureau is now using microwave equipment at three locations to transmit radarscope data from WSR-57's to points several miles distant. Microwave transmission provides a very good scope presentation which has been favorably accepted by pilots and airline dispatchers.

At present, microwave transmission is used between the Miami WBO and the Miami WBAS, the Charleston, S.C., WBAS and the Charleston Air Force Base, and the WBO and WBAS in New Orleans.

Equipment scheduled for installation in the near future will link WBAS, Fort Worth, to WBAS, Dallas; WBAS, Cincinnati, to WBO, Cincinnati; and WBAS (Metropolitan Airport), Detroit, to WBAS (City Airport), Detroit.

The equipment consists of a 0.1 watt microwave transmitter, operating in the 7000 megacycle range, with associated multiplex and modulating equipment located at the radar site. The receiver and demodulating equipment are located at the remote site.

Winds-Aloft Equipment Change Completed

February 27 marked the end of another phase in the Weather Bureau's program of improving upper-air observations. On that day, San Antonio began using its WBRT radiotheodolite, thus completing the changeover from manual to automatic-tracking winds-aloft equipment in the contiguous United States.

In these states, 66 automatic-tracking radiotheodolites are now in use -- 32 of the WBRT type and 34 of the GMD-1 and GMD-1A types. The GMD-1's will be replaced by WBRT's as the latter become available.

The next phase in the improvement program is the addition of transponder capability to the radiotheodolites, permitting the measurement of winds aloft even in jet-stream situations.

EMF: *A Status Report*

The Observations and Station Facilities Division has compiled the following status report on the Establishment of Meteorological Facilities Program. All figures are effective December 31, 1960.

Upper Air

Unfinished projects in this category carried over from our 1959 summary were: 4 relocations (Buffalo, El Paso, Green Bay, San Antonio); 4 inflation shelters (Huntington, Winslow, Lake Charles, Midland); installation of automatic tracking radiotheodolites at 42 stations in the contiguous 48 states and Alaska still using hand-operated SCR-658's, at 6 Pacific and 5 Arctic stations, at new stations Huntington and Winslow, and at 8 additional stations in the U.S. using obsolete GMD-1's.

New projects authorized in FY 1961 appropriations included: 2 station relocations (Nashville, Pittsburgh); procurement and installation of transponder adjuncts at 35 of our strategically located upper-air stations; and purchase and installation of upper-air observing equipment on 16 merchant vessels.

Status

Of the 4 carryover relocations, Buffalo and El Paso are complete; of the 4 shelters, Winslow and Midland are finished. The Green Bay relocation has been deferred in favor of Sterling, Va., for which a contract has just been awarded. The San Antonio site has been a problem, but the difficulty has now been resolved and bids will be advertised shortly. Specifications are being readied for Huntington, and the Lake Charles job is in progress. All but 2 of the original order of 42 radiotheodolites mentioned in last year's report are installed and operating, the exceptions being San Antonio and San Juan, where construction projects have held up installation of the radiotheodolites. The second procurement of radiotheodolites (23 from 1960 funds) is coming off the line, and about 6 had been delivered by the end of the year. The remaining 2 instruments of the early procurement and most of the FY 1960 procurement are expected to be operating by the close of Fiscal Year 1961.

Of the new relocations, specifications are being written for Nashville and site surveys are in progress for Pittsburgh. The contract has been awarded for 35 transponders with the preproduction model expected about April 15, 1961. Specifications for the marine upper-air equipment are being prepared, and bids will be advertised soon.

Radar

Incomplete radar projects carried over from the previous summary include installation of 31 specially designed weather search radars and installation of microwave links at 8 of these sites.

New radar projects specified in the 1961 appropriations were: repeater scopes and associated equipment at 17 Air Defense Command sites to permit WB employees to maintain round-the-clock weather watch at these ADC sites; installation of the Missoula radar on Point Six Mountain, including a two-way microwave that will permit full control of the radar from the WB station in Missoula.

Status

18 of the 31 WSR-57 radars were installed and operating by the end of calendar year 1960. Installation work is complete or nearly so on 6 others, and all but 3 of the original 31 are expected to be commissioned by the end of the fiscal year. Installations at Minneapolis, Chicago, and Missoula will carry over into FY 1962 for completion.

6 of the 8 original microwaves and the two-way microwave for Missoula have been purchased. Miami is operational, and New Orleans is being installed. Plans are to have 3 others (Cincinnati, Fort Worth, and Detroit) operational by the close of the fiscal year.

Funds to equip 17 ADC sites have been placed in reserve (S&E funds to provide people were not made available) and some of the funds will be diverted to other portions of the radar program (i.e. Chicago installation). The installation of the Missoula radar on Point Six Mountain is proceeding on schedule. The mountain top has been leveled, power lines are under construction, and bids are out for the building. Plans are to have the radar operative by the fall of 1961.

End-of-Runway

The program to purchase and install 75 sets (from 1956-57 appropriations) of end-of-runway

ESTABLISHMENT OF METEOROLOGICAL FACILITIES APPROPRIATION

Fiscal Year	Appropriation		Obligations
1956	7,500,000		4,796,033
1957	2,500,000		3,172,200
1958	600,000		1,262,420
1959	1,575,000		2,111,508
1960	2,500,000		1,937,436
1961	5,250,000	(Est.)	4,606,083
TOTALS	19,925,000		17,885,680

Amount Reserved for Subsequent Years $2,039,320

OBLIGATIONS BY FISCAL YEAR AND ACTIVITY

Activity	1956	1957	1958	1959	1960	TOTALS
Upper Air	744,506	1,523,694	35,290	261,515	938,322	3,503,327
WSR-57 radar	2,551,458	479,142	317,890	312,362	529,164	4,190,016
End-of-Runway	422,958	274,275	170,528	51,001	92,163	1,010,925
Other Surface	248,812	15,288	209,440	15,651	13,587	502,778
Construction in the Territories	58,160	595,740	311,553	266,916	105,909	1,338,278
Hurricane & Tornado Research	618,249	133,951	0	1,057,798	28,894	1,838,892
Hydrologic	0	0	0	0	47,042	47,042
Engineering & Technical Support	151,890	150,110	217,719	146,265	182,355	848,339
TOTALS	4,796,033	3,172,200	1,262,420	2,111,508	1,937,436	13,279,597

equipment at principal ILS terminals as mentioned in last year's summary continues, as does the program to purchase and install (from 1960 funds) 15 runway visual range (RVR) computers. These computers will be placed at those airports where the need is considered most critical by the FAA.

FY 1961 appropriations contained funds for purchase and installation of 52 additional sets of end-of-runway equipment (including recorders) at high priority ILS airports. Funds were also included for procurement and installation of 105 additional RVR computers at additional airports meeting FAA criteria for establishment of these observations.

Status

Of the original 75 pairs of end-of-runway equipment, only 4 rotating beam ceilometers and 5 transmissometers remain to be commissioned. These will all be operative by the end of June 1961. The preproduction model of the 15 RVR computers (1960 funds) have been received. Delivery of the full order is expected within 2 or 3 months, and installation of most instruments will have been completed by the end of the fiscal year.

Contracts have been awarded for 52 rotating beam ceilometers, transmissometers, and recorders authorized in FY 1961 appropriations. Delivery of preproduction models of all three instruments is promised for soon after the first of the year. Specifications are nearly complete for the 105 RVR computers approved in FY 1961, and bid invitations will be released sometime in February 1961.

Other Surface Observational Facilities

Incomplete projects carried over from last year's report were: installation of 134 hygrothermometers (121 thermistor, 13 telemeter) together with aspirators, supports, and other accessories capable of being remoted; installation of 107 wind recorders capable of continuously indicating wind direction, speed, and gustiness and of recording passage of each mile of wind. The recorders will first be loaned to hurricane and tornado research programs for a year or two, after which they will be installed at first order Weather Bureau offices throughout the country.

New projects in this activity authorized in FY 1961 include: purchase and installation of 70 hygrothermometers (55 metameter, 15 infrared) at high priority airports; purchase and installation of 81 wind recorders (possibly with readout capability) at high priority locations; procurement and installation of 5 automatic meteorological observing stations (AMOS IV); procurement and installation at airport locations of 70 modern briefing consoles.

Status

As of December 31, 1960, 107 of the 134 hygrothermometers were commissioned and operating. The remaining 27 instruments of the original procurement are expected to be operative by the end of FY 1961, thus completing the original hygrothermometer program. The remaining portion of the wind recorder order (100) has been delivered and tested. Action is under way to set up these recorders in hurricane and tornado research projects as originally planned prior to installation at first order Weather Bureau offices.

Contracts were awarded in December 1960 for the sensors and thermo shields of the 1961 metameter hygrometers. Preproduction model of the sensor is expected by the end of June 1961 and of the thermo shield by the end of January 1961. Bids are about ready for the aspirators. Specifications are being readied for the infrared hygrometer, as is the case with the AMOS IV order. Funds for briefing consoles have been placed in reserve, and there is a strong possibility that these funds will be reprogrammed for other use.

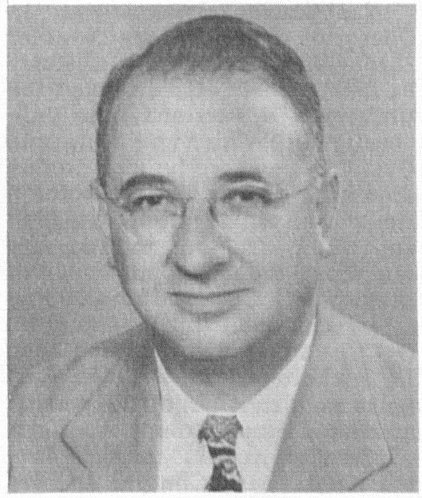
Construction in the Territories

The only carryover construction project in this category was that to provide living quarters and office facilities for the upper-air station takeover at Shemya, Alaska.

Funds were authorized in 1961 appropriations to construct 4 housing units at Nome, Alaska. Present Weather Bureau Nome housing is in the city area and is maintained by FAA. However, FAA is building housing for its people at the airport and plans to abandon the city housing.

Due to relocation of FAA facilities at King Salmon, it be-

Dr. Wexler Receives Career Service Award



Dr. Wexler

Dr. Harry Wexler, Director of the Office of Meteorological Research, was one of ten Federal employees who received Career Service Awards from the National Civil Service League on March 21. The awards were presented at a dinner in Washington, D.C., attended by many leaders of government, business, education, and the professions.

The National Civil Service League, a nonpartisan organization, has worked since 1881 to improve public personnel management at all levels of government. Through the Career Service Awards, the League seeks to increase the prestige of public service by giving national recognition to significant careers in the Federal service.

The award winners are selected for their outstanding achievements, efficiency, integrity, and devotion to the principle of public service.

Speaking at the awards dinner, Secretary of Commerce Luther H. Hodges said:

"Dr. Wexler has been in the career service for 26 years. His contributions to meteorological science have not only made him nationally pre-eminent, but have brought him international recognition.

"As Director of the Weather Bureau's Office of Meteorological Research, he has, among other things, been instrumental in directing an investigation of the meteorological problems connected with atomic energy; in guiding a program for the development of numerical weather prediction; in conducting research on solar radiation and high atmospheric problems, and in the shaping of a program for further investigation of the general circulation of the atmosphere around the world.

"In 1957-58, Dr. Wexler was Chief Scientist of the United States' Antarctic Program for the International Geophysical Year. He has received several awards for his scientific work, has written extensively, and has participated in numerous international committees on meteorology. He has, in short, had a distinguished career. Were there more men like him, giving their time and talents to the public service, I am sure this government and country would be the better for it."

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came necessary for the Weather Bureau to move its inflation shelter at that location and also to pay its share of the new FAA building. Funds were reprogrammed from residual Shemya funds to take care of this project.

Status

Completed quarters and office facilities at Shemya were accepted by the RAO, Anchorage on June 3, 1960.

Weather Bureau housing units at Nome, authorized in 1961, will be constructed by FAA in conjunction with their own construction program at that location. The units will be constructed during the coming summer months and should be ready for occupancy by fall of 1961. Work will begin on the King Salmon move in early summer of 1961, with completion scheduled by fall.

Hurricane Research

From the standpoint of the EMF program, hurricane research programs are complete. Completion of certain hurricane aircraft instrumentation begun previous to FY 1961 will appear in the 1961 EMF fiscal accounts. The establishment by the Congress of an R & D appropriation within the Weather Bureau in FY 1961 precludes further scheduling of EMF funds for research purposes.

Hydrologic Instrumentation

The FY 1960 program to purchase and install modern river and rainfall gaging equipment, together with the necessary communications facilities, carries over from last year.

FY 1961 appropriations authorized additional hydrologic equipment as follows: 2 automatic river gages; 7 radio river/rainfall gages; 19 radar beacon rain gages; 50 radio transceivers for flash flood networks; and 25 paper tape recording telemetering rain gages.

Status

The 1960 procurement of 24 automatic rain gages is practically complete, with 14 instruments installed and operating as of December 31, 1960. Three (3) of the 5 radio river/rainfall gages in the 1960 program are being installed, with 2 already in operation. The contract for the 1960 procurement of 21 radar beacon rain gages has been awarded with first deliveries expected in June 1961. The 1960 procurement of 50 radio transceivers is complete, and 15 of the instruments are in operation.

Surveys are being made and specifications readied for the 2 additional automatic river gages approved for 1961. Specifications are also in progress on the 7 radio river/rainfall gages in the 1961 program. Contract has been awarded for 19 additional radar beacon rain gages, with delivery expected during the fall of 1961. Bids should be out around March 1 for the 50 radio transceivers for 1961 and about February 15 for the 25 paper tape recording telemetering rain gages.

Six New Station Chiefs Appointed

The new Meteorologist in Charge of the Anchorage Weather Bureau Airport Station is Harry P. Foltz. Mr. Foltz attended the University of Portland, the University of Washington, and U.C.L.A., where he was graduated with a B.S. in meteorology. He served in the Army in 1943 and 1944, before joining the Weather Bureau as an Observer at Burbank, California. He was later stationed in Washington, D.C., and Seattle, and has been at Anchorage since 1956. Mr. Foltz is a member of the current Advanced Study Group.

Charles Hanas, the new Meteorologist in Charge of the Weather Bureau Airport Station at Annette, Alaska, joined the Weather Bureau in 1946 at Binghamton, New York. Mr. Hanas has served in Alaska at Northway, Bethel, and Annette Island. In 1957 and 1958, he was Administrative Officer with the Polar Operations Project at Resolute Bay. For the past two years, he has been a Meteorological Technician at Sault Ste. Marie, Michigan. Mr. Hanas served as a weather observer in the U.S. Air Corps from 1942 until 1945.

Rue E. Rush, the new Meteorologist in Charge at Wake Island, entered the Weather Bureau in 1946 after four years as a weather forecaster in the U.S. Army. He has served at the Weather Bureau Airport Station in Honolulu since 1949, with the exception of six months at Wake Island. Mr. Rush is a graduate of Arizona State College.

Walter R. Davis, the new Chief Airport Meteorologist at the Miami Weather Bureau Airport Station, has been Principal Assistant at the Miami Weather Bureau Office since 1956. Mr. Davis is a graduate of Guilford College and has taken additional courses at the University of Florida and the University of Miami. He has been with the Bureau since 1930, and all of his service has been in Miami.

On March 1, Woodrow C. Mossman was assigned as Observer in Charge at the Weather Bureau Airport Station, Barter Island, Alaska. Prior to this assignment, Mr. Mossman served as Rawinsonde Specialist at Winnemucca, Nevada. He has had previous Alaskan experience at Anchorage, King Salmon, and Barter Island.

David C. Brown has been selected to succeed Max H. Baumgartner as Observer in Charge at the Weather Bureau Office in Stampede Pass, Washington.

Welcome to the Weather Bureau

Robert J. Corliss, Met. Tech., Stampede Pass, Wash.
Margaret A. DiNenna, Clerk-Typist, Central Office
James W. Gilreath, Hydraulic Engineer, Augusta, Ga.
Henry T. Gurley, Meteorological Technician, Louisville, Ky.
Virginia Harris, Card Punch Operator, San Francisco
Leo Richard Harrison, Jr., Met. Tech., Central Office
John F. Hoehn, Meteorological Technician, Chicago
Annette E. Jones, Mathematician, Central Office
Gene S. Levi, Meteorologist, Kansas City
James H. Lienesch, Meteorologist, Central Office
Lewis E. Mills, Electronic Technician, Resolute Bay, Canada
Dominick J. Mirabella, Meteorologist, New York City
Elizabeth B. Otero, Clerk-Stenographer, Central Office
Margaret W. Phillips, Clerk-Stenographer, Salt Lake City
Carmine J. Pisano, Meteorological Technician, Wendover, Utah
Martin F. Renzo, General Maintenance Mechanic, New York City
Delbert S. Seibert, Jr., Electronic Technician, Alert, Canada
Ralph E. Walker, Meteorological Technician, Miami
Warren L. Walker, Electronic Maintenance Technician, Amarillo
Walter Joseph Weyres, Meteorologist, Central Office

The Bureau is in need of good photographs illustrating snow pellets, ice pellets, and other more or less uncommon forms of precipitation. We also have a request from the Canadian Meteorological Service for such photographs to be used in their observational manuals. If any Weather Bureau personnel have photographs of these phenomena, we would appreciate having the opportunity to copy them. Please send the photographs to Surface Unit, Observations and Station Facilities Division, stating whether we can have the authority to use the pictures in official Weather Bureau publications and to lend them to other meteorological services.

RETIREMENTS

Henry P. Adams

Henry P. Adams, Meteorologist in Charge of the Weather Bureau Airport Station in Philadelphia, retired on March 18 after 47 years of Weather Bureau service.

Mr. Adams joined the Bureau in 1913 as a messenger boy at Concord, New Hampshire. He was later stationed at Charlotte, N.C.; Washington, D.C.; Leesburg, Ga.; Broken Arrow, Okla.; Key West, Fla.; Groesbeck, Texas; Cheyenne, Wyoming; Dallas, Texas; and Fort Worth, where he was in charge of the Weather Bureau Office. In 1941, he went to Philadelphia, where he was MIC for the 20 years preceding his retirement.

Mr. Adams served in the Army in 1918 and 1919. While working for the Bureau, he attended evening classes at Southern Methodist University and the University of Pennsylvania.

Mr. Adams' address is 257 Priscilla Lane, Aldan, Penna.

Pauline T. Best

Mrs. Pauline T. Best, a Printing and Publications Clerk in the Central Office, retired February 7, 1961, after 28 years of government service. Mrs. Best came to the Weather Bureau in 1940 from the Veterans Administration. Her address is 10510 New Hampshire Avenue, Silver Spring, Maryland.

Length of Service Awards

40-Year Award

Sidney W. Overton,
NWRC Asheville

35-Year Awards

Sherman M. Brewster,
NWRC Asheville
Joseph H. Hagarty,
Climat Central Office

30-Year Awards

Lorenz C. Armstrong,
B&M Central Office
Richard A. Dightman,
WBAS Helena
Edward J. Fencl,
WBAS Waterloo
Aubrey L. Haynie,
WBAS San Angelo
Harold L. Julien,
WBAS Lansing
Harlan C. Rinard,
WBAS Eugene, Ore.

25-Year Awards

Glenn W. Brier,
OMR Central Office
Lionel Broussard,
WBAS Port Arthur
Robert E. Corbin,
WBAS Phoenix
Rena M. Day,
DMO Washington, D.C.
Homer D. Dyck,
WBAS Cleveland
Baltasar Jiminez,
WBAS San Juan
Gaspare Licausi,
Adm. Ops. Central Office
Carl M. Peterson,
WBAS Rockford
Alice S. Voll,
Adm. Ops. Central Office

15-Year Awards

Richard M. Davis,
NWRC Asheville
Frank Dendis,
Instr. Eng. Central Office
Joseph P. Dooley,
WBAS Nantucket
Marcella D. Frentz,
Climat Central Office
James A. Harman,
WBAS Fort Worth
Dorothy F. Hensley,
NWRC Asheville
Richard M. Jackson,
NWRC Asheville
Joseph P. Johnston,
DMO Kansas City
Alex J. Kish,
WBAS Jackson, Miss.
Edward Lazar,
WBO Chicago
Robert E. Lucas,
WBO Point Arguello
Frederick J. Miles,
WBAS Detroit (City Airport)
Dorothy O. Pirkle,
NWRC Asheville
Kenneth O. Poteat,
WBAS Orlando
Florence A. Swigert,
DMO Kansas City
Donald A. Thompson,
WBAS Scranton
Leland D. Wilkins,
WBO Pomona

Transfers

	FROM	TO
Luis Aldaz	Antarctica	Central Office
Brantley B. Christian	Jacksonville	Miami
Thomas S. Craig	Cold Bay	Anchorage, Alaska
Howard T. Ellis	Central Office	Hilo, Hawaii
Edwin C. Flowers	Antarctica	Central Office
Clifton W. Green	Amarillo	Wichita Falls
Ralph E. Hackman	St. Cloud, Minn.	Huron, S. Dak.
Jack A. Hansen	Brownsville	Fairbanks, Alaska
John P. Hennek	Anchorage	San Francisco
George J. Hiebing	Columbia, Mo.	Burlington, Iowa
Allen J. Jacoby	Anchorage	Huntsville, Ala.
Milton R. Lefebvre	Kansas City	Minneapolis
Robert E. Lucas	Point Arguello	Oakland, Calif.
John H. Maloney, Jr.	Antarctica	Truk, T.T.
Marvin G. McQuate	Rapid City, S. Dak.	Cheyenne
John R. Metzler	Reno	Salt Lake City
Philip V. Nadeau	Bridgeport	Caribou
Elwood E. Norton	Rapid City	Huron, S. Dak.
George Y. Okoji	Wake Island	Johnston Island
Donald H. Oldmixon	Wichita Falls	New Orleans
William M. Paggi	Akron	Charleston, S.C.
Paul S. Peter	Truk, T.T.	Ponape, T.T.
Callus C. Quigley	Johnston Island	Los Angeles
George E. Razevich	Dayton	Arctic Drift Station
Arnold M. Recht	Key West	Miami
James L. Robinson	Bridgeport	New York
Fred W. Rubin	Winnemucca, Nev.	Rapid City, S. Dak.
Rue E. Rush	Honolulu	Wake Island
Leslie D. Sanders	Washington	Kansas City
Ethan A. Scott	San Antonio	Key West, Fla.
James K. Shirai	Wake Island	Honolulu
Arthur F. Shumski	Caribou	Nantucket
Edward T. Sjoberg	Arctic Drift Station	St. Louis
Curtis J. Smith	Chicago	Lincoln, Nebr.
C. Hugh Snyder	St. Louis	Honolulu
Angelo F. Spano	Antarctica	Central Office
Don C. Starkey	Battle Creek	Muskegon
Milton G. Stirdivant	Huron, S. Dak.	Madison, Wis.
Harry Temple	New York	Albany
Timmy J. Therkelsen	Cordova	Cold Bay, Alaska
Russel W. Thompson	New York	Central Office
Karen R. Treese	Central Office	Fort Worth
N. Lester Troast, Jr.	Annette, Alaska	Kwajalein
Richard J. Wagner	Eniwetok	Kwajalein
J. Allen Wallace, Jr.	Antarctica	Central Office
Neil B. Ward	Kansas City	Oklahoma City
William H. Whitson	Antarctica	Red Bluff, Calif.
James F. Wildes	Midland, Texas	Atlanta, Ga.
Lawrence F. Windt	Brownsville	Raleigh
Robert G. Woodard	Johnston Island	Nantucket
Henry M. Yamada	Canton Island	Wake Island

Meteorological Readings

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate. For more introductory information, see TOPICS May 1957. When submitting answer cards, please mark envelope in lower left corner: "Meteorological Readings."

Assignment XLVII: Geographical Frequency of Troughs and Ridges on Mean 700-Mb. Charts on pages 344-358, Monthly Weather Review, Volume 86, Number 9, September 1958.

About the Assignment: In this article, geographical frequencies of occurrence of troughs and ridges on 5-day and 30-day mean 700-mb. charts are presented and discussed.

QUESTIONNAIRE

Col. 61 Favored positions for troughs, throughout the whole year are:

1. Eastern Canada, the Bering Sea, the Southeast Pacific, the West Coast of Africa and India-Burma
2. the Appalachians, West Coastal U.S., the Bering Sea, and Siberia (east of Lake Baikal)
3. the eastern U.S., the Canadian Rockies, the Western Pacific and Western Africa
4. none of the above

Col. 62 The most striking example of a region of infrequent troughs during the entire year is:

1. the Eastern Rockies (U.S.)
2. the Canadian Divide
3. Western Europe
4. Western U.S.

Col. 63 The fact that centers of maximum frequencies are more sharply delineated on the 30-day mean chart indicates:

1. that geographical preferences are more pronounced on the 30-day mean charts than on the 5-day
2. that averaging over 30 days does less truncation than averaging over 5 days
3. that troughs move slower than 10 degrees of longitude per 5 days
4. geographical features (such as mountains) have little effect on favored trough positions

Col. 64 The frequency distributions of ridges:

1. are the same as those of troughs
2. are just about inverse to those of troughs in corresponding months
3. are more dependent on geographical features than those of troughs
4. exhibit considerable differences between the 5-day and 30-day mean positions

Col. 65 In some areas, as in parts of the Aleutians, both ridges and troughs are frequent during certain months. This is because:

1. these are centers of action and the 700-mb. heights are very variable
2. these are areas where cyclogenesis is favored
3. the converging longitude lines distort the statistics and overlapping (or redundancy) is experienced
4. seasonal changes occur abruptly over these places

Col. 66 Over the following places troughs are infrequent during the summer, but abundant during the rest of the year:

1. East Coastal U.S. and Gulf of Alaska
2. lee of Rocky Mountains and Siberia
3. India-Burma, Mississippi Valley and the Plains States
4. Alaska, Japan, Near East and the Mediterranean

Col. 67 Frequencies of troughs increase abruptly from August to September over:

1. Alaska, Siberia and the Appalachians
2. Japan, Alaska and Korea
3. Eastern Canada, Alaska and Siberia
4. Japan, Alaska and the Mississippi Valley

Col. 68 The highest frequency of 5-day mean troughs observed anywhere in the Northern Hemisphere during any month of the year is:

1. Eastern Canada
2. West Coast of Africa
3. India-Burma
4. Just west of lower California

Col. 69 Some areas of persistent low trough frequency are:

1. the Canadian Divide, Japan, and Alaska
2. India-Burma, Western Europe and the Near East
3. the Texas Gulf Coast, the Greenland Plateau and the Canadian Divide
4. none of the above

Col. 70 The differences in length of 10 degree longitude intervals at high and low latitudes:

1. were neglected in this study
2. were taken into account by multiplying the length of each interval by the cosine of 50°
3. were taken into account by multiplying the frequencies (of troughs or ridges) by the ratio of the cosine of 50° to the cosine of each latitude
4. were adjusted differently in each season

DEATHS

Lulu R. Jones

Mrs. Lulu R. Jones, formerly an Observer at Eureka, California, died on March 7. Mrs. Jones served at the Eureka station from 1924 until 1943, when she retired.

Vincent F. Martin

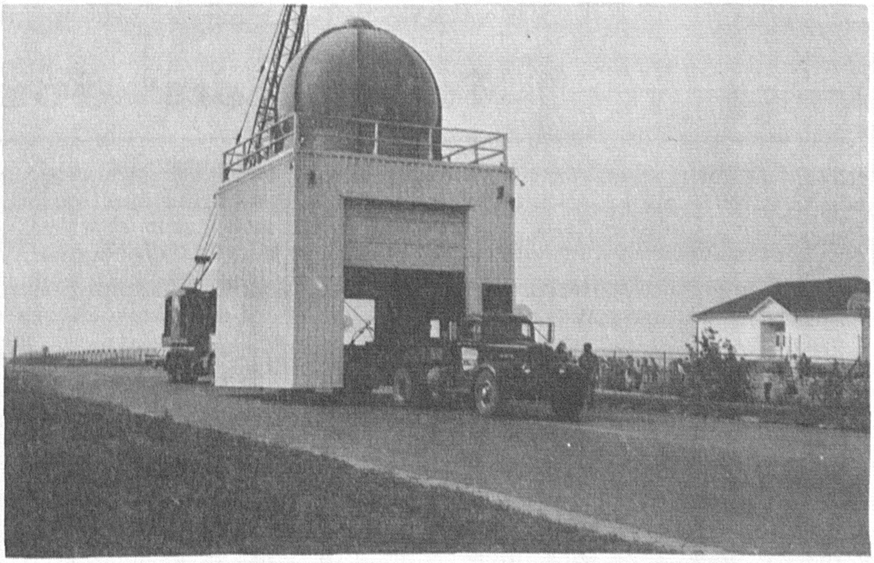
Vincent F. Martin, an Accounting and Fiscal Clerk in the Central Office Administrative Operations Division, died on March 27. A graduate of Benjamin Franklin University in Washington, D.C., Mr. Martin came to the Weather Bureau in 1959. He had held several positions in private industry and served in the U.S. Navy from 1952 to 1955. Mr. Martin is survived by his parents, Mr. and Mrs. Sylvester A. Martin, of 3926 W Street, N.W., Washington, D.C.

Carl G. Morten

Carl G. Morten, Meteorological Technician at the Weather Bureau Airport Station in Duluth, Minnesota, died on March 15, 1961. Mr. Morten joined the Bureau as a Junior Observer at Duluth in 1927. He later served at Cheyenne, Wyoming, and Rochester, Minnesota, where he was MIC for eight years. In 1952, Mr. Morten returned to Duluth and remained there until his death. He is survived by his wife, Mrs. Esther G. Morten, who lives at 1305 Missouri Avenue, Duluth, and a grown son.

John T. Remick

John T. Remick, a Meteorologist in the Emergency Warning Section of the Central Office, died on March 23. Mr. Remick attended the University of Buffalo and the University of Illinois, and received a Bachelor of Science degree from the Massachusetts Institute of Technology in 1941. He served in the United States Air Force from 1940 to 1945 and joined the Weather Bureau in New York City in 1946. He later was stationed at Washington, D.C., Detroit, and Keflavik, Iceland. Mr. Remick is survived by his parents, Mr. and Mrs. Frederick B. Remick, of Lockport, N.Y.; two brothers; and one sister.



Moving Day at Peoria

When a new terminal building was built at the Peoria, Illinois, airport, the Bureau's prefabricated inflation shelter and radiotheodolite dome was moved three-quarters of a mile. The relocation cost only about one-third as much as a new shelter.

Before the move, the shelter was reinforced, unbolted from its foundation, jacked up, and set on blocks. After the morning observation on moving day, the rawinsonde-tracking antenna and receiver and the steel stairway were removed from the shelter. The building was lowered onto a trailer and, steadied by a steel cable attached to a mobile crane, traveled to its new location. Some power and telephone lines along the route had to be removed to permit the 35-foot tall shelter to pass. The move was completed without damage to the building or instruments.

This project is an example of the unusual tasks which the Facilities Sections of our Regional Administrative Offices are frequently called upon to plan and carry out.

Bureau Enlists Aid to Collect Examples Of Use and Value of Weather Information

What is the value of weather information?

While there is no definitive answer to this intriguing question, the Weather Bureau has inquiries made of it, from time to time, as to the value of weather information to the public welfare. We know, for example, that temperatures are required by agriculture and transportation; barometric pressures are needed by some health agencies.

The Central Office has enlisted the cooperation of all MIC's in helping to assemble specific material related to the use and economic value of weather information. The Bureau is seeking to obtain a reliable relationship of the usefulness of each element of weather information, such as wind, temperature, and hydrometeors, to every activity that can be identified.

The purposes of this project are threefold: (1) to seek ways of improving weather releases; (2) to aid in planning research and development commensurate with total returns to the taxpayer; and (3) to identify geographic areas where special needs are concentrated.

MIC's have been asked to obtain letters from different types of users in their communities, stating the use made of weather information and the value placed upon it.

Forecasters' Forum

(NOTE: As discussed in TOPICS for January, 1960, Forecasters' Forum is included in TOPICS because of administrative reasons where formerly it was a separate publication. It still remains a function of the F&SR Division and editorial control of Forecasters' Forum rests with that Division. Contributions and comments regarding this department should be addressed accordingly.)

(Editor's note: The following report, based on studies by Jerrold LaRue of the recently established QPF Unit at NAWAC, was submitted to F&SR by the Assistant Director of the National Meteorological Center. The report is included in the Forecasters' Forum because of the wide interest in the work of this unit.)

During the four day period from 1200Z October 15 to 1200Z October 19, heavy rains occurred over Texas, New Mexico, and Oklahoma. As a result, there was some flooding, mostly of a local nature, but which could have been very serious had the ground been saturated or streams and rivers already high.

To evaluate the forecasts that were issued by the NMC QPF Unit during the storm period, the forecast and observed precipitation amounts were totaled at points where precipitation was observed. In addition to regular Weather Bureau Stations, these included some observation points in the River Services reporting network. The results are shown in the accompanying figures.

The forecast precipitation amounts were estimated using the gradient of the forecast isohyets but amounts less than .25 inch were not included due to the difficulty in estimating amounts outside the forecast areas. The maximum error possible from this limitation would be less than one inch and would be to underestimate the forecast amount.

The area forecast (Af), the area observed (Ao), and the area correct (Ac) were measured with a planimeter. Having done this, it is quite simple to obtain the prefigurence $\frac{Ac}{Af}$, the postagreement $\frac{Ac}{Ao}$, and the threat score $\frac{Ac}{(Af-Ac)+(Ao-Ac)+Ac}$. These results are given in Table I.

As might be expected, the scores are much higher than ones computed on a daily basis. Table II provides a comparison of the daily four day averages and the average scores of the forecasts issued by the QPF Unit during the last 15 days of September.

Synoptically, the rain was in association with a 500 mb. low over the Southwestern States. Each day the JNWP 500 mb. prognoses retrograded this low rapidly southwestward while in actuality the low retrograded little or was nearly stationary. The effect of this is quite noticeable in the differences between the early forecast and the later revision. The 1200Z RADAT data which were available for the revised forecast indicated that the 500 mb. 12-hour prog was in error. This led to correcting both the initial conditions which in the early forecast are based on the numerical 12-hour prog and the end of the period conditions through modification of the numerical 36-hour 500 mb. prog. Generally each day the revision was to increase precipitation amounts and to shift the pattern to the north and east.

TABLE I Verification scores of the forecast precipitation amounts totaled for the storm period October 16-19. The early forecast refers to the one issued at approximately 1200Z and the revised to the one issued at 1700Z.

EARLY FORECAST				REVISED FORECAST			
Amount	Pre-Figurence	Post-Agreement	Threat Score	Amount	Pre-Figurence	Post-Agreement	Threat Score
1.00	.79	.68	.58	1.00	.84	.85	.68
2.00	.70	.60	.48	2.00	.69	.88	.63
3.00	.66	.46	.37	3.00	.53	.78	.46
4.00	.45	.31	.23	4.00	.23	.56	.20
5.00	0	0	0	5.00	.05	.19	.04
6.00	0	0	0	6.00	.02	.07	.02
7.00+	0	0	0	7.00+	0	0	0

WEATHER BUREAU EMPLOYEES assigned to the NASA Pilotless Aircraft Research Station at Wallops Station, Virginia, have received a letter of commendation from the Central Office for the efficient and workmanlike manner in which they assumed the relatively new and important meteorological functions associated with the research station. In the photograph above (left to right), Robert L. Krieger, Director of NASA's Wallops Station, and John Spurling, NASA Meteorologist, congratulate the Weather Bureau personnel: Lloyd W. Chamberlain, MIC; Ralph L. Cutshall, forecaster; Robert J. Mullin and Joseph H. Brewton, missile range observers; Harold E. Boone, electronic technician; and Alden P. Richter, principal assistant. William E. Higgins, missile range observer, was on annual leave when the picture was made.

TABLE II Average verification scores of the daily quantitative precipitation forecasts for the period October 16-19, and the average scores during the last half of September.

Early Forecast October 16-19

Amount	Pre-Figurence	Post-Agreement	Threat Score
1.00	.40	.29	.21
2.00	.34	.15	.12
3.00	0	0	0
4.00	0	0	0
5.00			

Revised Forecast October 16-19

Amount	Pre-Figurence	Post-Agreement	Threat Score
1.00	.40	.54	.35
2.00	.28	.34	.18
3.00	.16	.10	.07
4.00	0	0	0
5.00			

Early Forecast September 16-30

Amount	Pre-Figurence	Post-Agreement	Threat Score
1.00	.24	.34	.16
2.00	.19	.18	.10
3.00	.08	.15	.06
4.00	0	0	0
5.00	0	0	0

Revised Forecast September 16-30

Amount	Pre-Figurence	Post-Agreement	Threat Score
1.00	.33	.50	.25
2.00	.22	.32	.15
3.00	.24	.29	.15
4.00	0	0	0
5.00	0	0	0

CONTENTS

COVER: The Weather Bureau's B-57, one of the thirteen aircraft participating in the National Severe Storms Project (see pages 58-60).

SEAT BELTS SAVE LIVES!

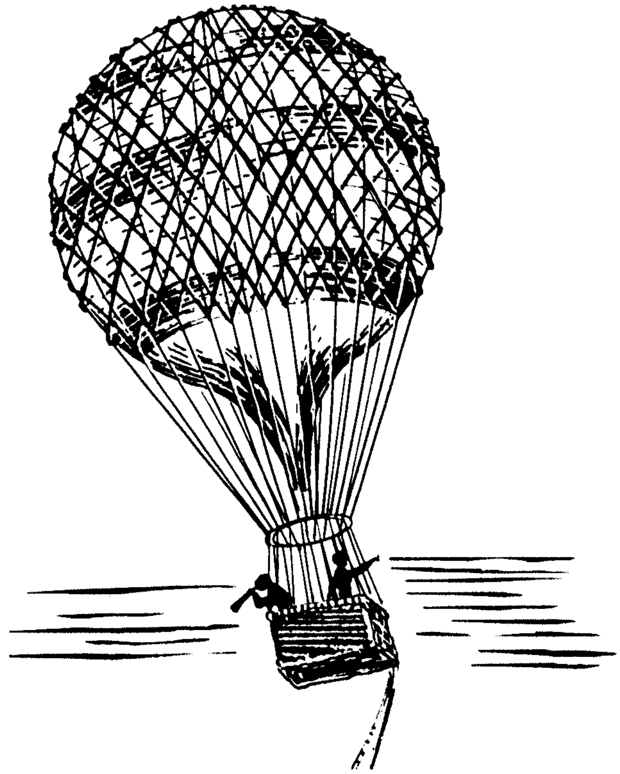
In an automobile accident, you are 60% less likely to be injured if you are wearing a seat belt. More important, you are 50% less likely to be killed. The Department of Commerce is urging all employees to install seat belts in their cars.

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

Volume 20

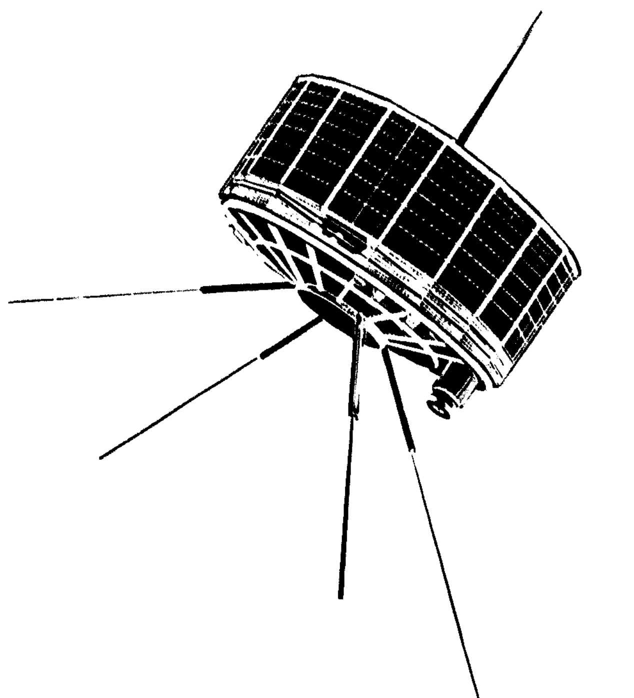
TOPICS

MAY 1961



70 YEARS OF PROGRESS 1891-1961

Anniversary Issue



S. DEPARTMENT OF COMMERCE
WEATHER BUREAU

preface

The theme that meteorology and the Weather Bureau stand on the threshold of a new era has been printed in many recent articles in national magazines and newspapers. It has been voiced on network radio and television. It has appeared in technical reports, in Congressional hearings, and in speeches made by the President of the United States, the Secretary of Commerce, and by professional meteorologists throughout our country.

We constantly refer to our science as one with a great potential for future growth. We point with pride to the tools that modern technology has given us -- satellites, electronic computers, rocketsondes--to do the job in the future.

The National Meteorological Center, for instance, is indeed a milestone in the progress of meteorology, but it is only one example of our earnest effort to give the nation the best possible meteorological service within available resources.

As the national weather service, we are directed by Congress, through the Organic Act of 1890 and subsequent amendments, to provide all weather services required for the public safety and national welfare.

The job gets bigger and bigger with each passing year, and the demands grow greater and greater.

In the pages of this commemorative issue of TOPICS, there are many articles that should have more than just a passing interest for all Weather Bureau personnel, whether they be the old-timers or the weathermen of tomorrow. They should serve as chest-expanders for the yeoman job that Weather Bureau employees have done in the past, and they should stand as a prologue for the new frontiersmen in the weather science. Time and space do not permit recounting the many examples of heroism and devotion beyond the call of duty by Weather Bureau employees throughout the years.

In no other agency, in no other era, has any group had more reason to feel proud of its accomplishments than the U.S. Weather Bureau. We have truly had 70 years of progress as a civilian agency.

J.W. Osmun
Deputy Chief

Chiefs

of the

National Weather Service

In Signal Corps Days

(1870-1891)

General A.J. Myer

General W.B. Hazen

General A.W. Greely

The Weather Bureau

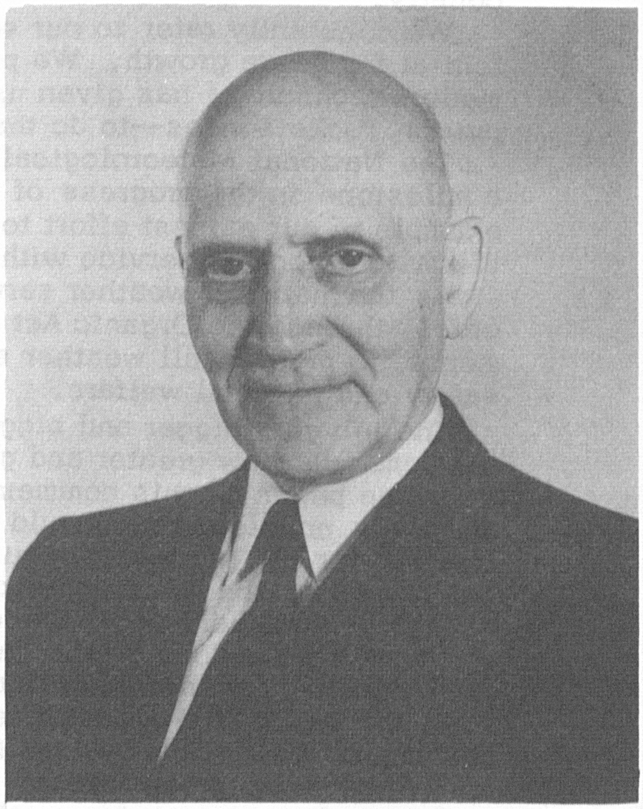
(since 1891)

Mark W. Harrington

Willis L. Moore

Charles F. Marvin

Willis R. Gregg



Present Chief:

F.W. Reichelderfer

THE NATIONAL WEATHER SERVICE

Its Creation and Its Growth under the Signal Corps

July 1, 1961, marks the seventieth anniversary of the Weather Bureau as a civilian organization. An Act of Congress, transferring the national weather service from the Army Signal Corps to the Department of Agriculture, was passed in 1890 and became effective on July 1, 1891.

Nearly 250 years of weather observation and study in this country preceded the passage of this Act. The first continuous weather records in what is now the United States were kept in 1644 and 1645 by the Reverend John Campanius Holm, near Wilmington, Delaware. Later, other men kept "weather diaries" from time to time, in many parts of the country. The best-known of these was Thomas Jefferson, who was regarded as a weather expert in his day and used his records to answer many inquiries about American weather and climate.

The first government collection of weather observations came during the War of 1812, when Dr. James Tilton, the Surgeon-General of the Army, ordered hospital surgeons to observe the weather and keep climatological records. In the nineteenth century and early in the twentieth, there was tremendous interest in the effects of weather on health. This was the reason for Dr. Tilton's order. By 1853, 97 Army camps were keeping weather records, and many medical studies were based on these observations, including an investigation of the association of yellow fever with climate.

In the same period, other federal and state agencies set up observing networks. In 1817, Josiah Meigs, Commissioner-General of the Land Office, began a system of observations at land offices. From 1825 through the 1850's, New York University collected weather observations from a network of 30 stations. The State of Pennsylvania had a similar, smaller network.

In 1849, Professor Joseph Henry of the Smithsonian Institution established an extensive observation network by supplying weather instruments to telegraph companies. Simultaneous observations were made by local telegraph operators and sent to the Smithsonian. Maps prepared from these observations were displayed in Washington, D.C. Dr. Henry frequently made predictions based on the maps, and these became the first published weather forecasts in the United States.

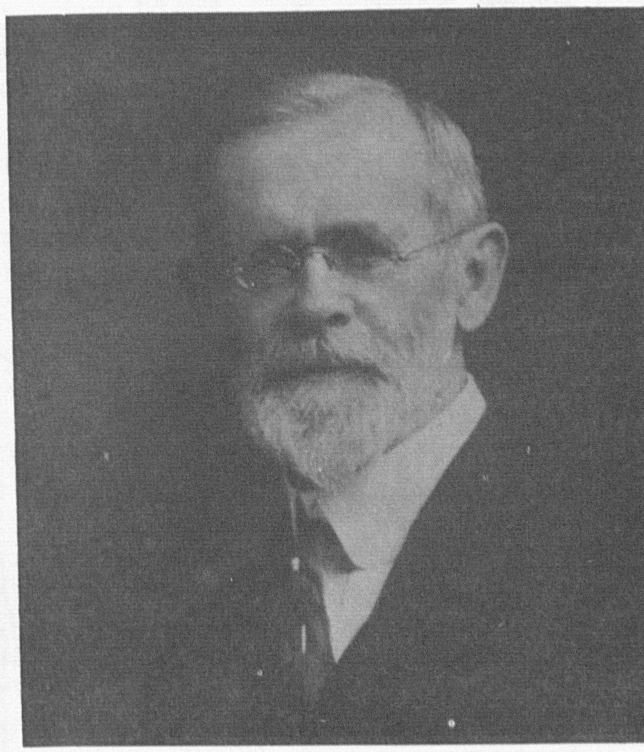
By 1860, Professor Henry had 500 stations making regular weather reports, but the coming of the Civil War broke up his network, and it never returned to its prewar strength.

In his annual report for 1865, Professor Henry advocated the reorganization of all meteorological observations in the United States under one agency as an effective means of predicting storms and warning coastal shipping.

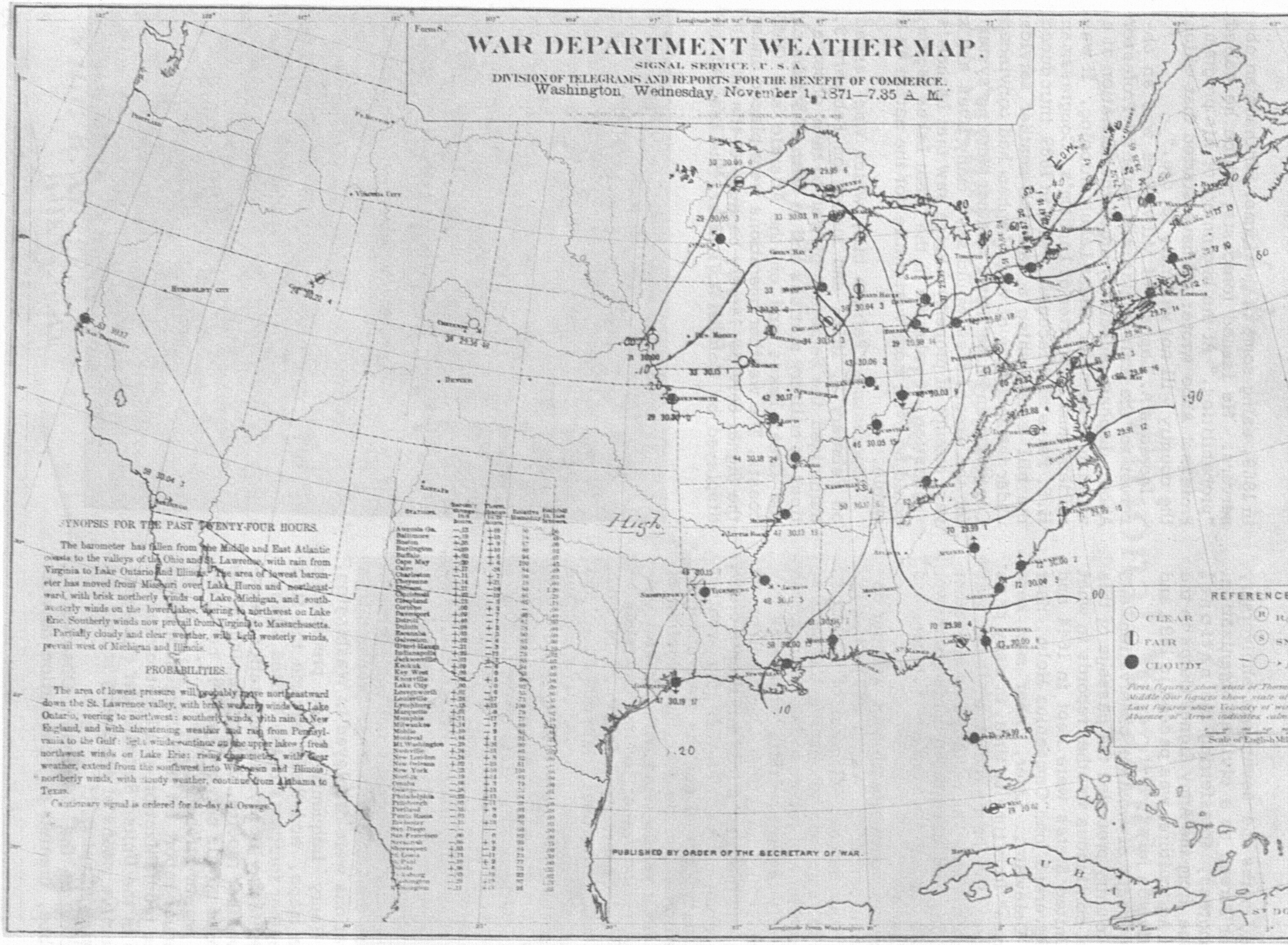
The director of the Cincinnati Observatory, Cleveland Abbe, created an observation network in 1869, using some of the former Smithsonian observers. He issued forecasts, which he called "probabilities." At the beginning of his program, Professor Abbe wrote: "I have started that which the country will not willingly let die."

Increase A. Lapham of Milwaukee was an observer for the Smithsonian and later for Professor Abbe. Lapham repeatedly urged the formation of a warning system for Great Lakes shipping. It was a friend and supporter of Lapham's, Congressman H.E. Paine of Wisconsin, who in 1869 introduced the bill establishing a national weather service under the Secretary of War. Lapham had convinced Congressman Paine that a weather warning system for the Great Lakes would save many lives and a vast amount of property. Paine saw that Lapham's suggestion, if valuable in the Great Lakes region, could be even more worthwhile for the nation as a whole.

Congressman Paine's bill, which was passed on February 2, 1870, and signed on February 9, authorized the Secretary of War to take observations at military stations and to warn of storms on the Great Lakes and on the Atlantic and Gulf coasts. The weather operations were placed under the Signal Service, largely because of the interest displayed by Colonel A.J. Myer, the head of the



Cleveland Abbe



Form 8.
WAR DEPARTMENT WEATHER MAP.
SIGNAL SERVICE, U. S. A.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.
Washington, Wednesday, November 1, 1871—7.35 A. M.
Longitude West 32° from Greenwich
Low
High
SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.
The barometer has fallen from the Middle and East Atlantic coasts to the valleys of the Ohio and St. Lawrence, with rain from Virginia to Lake Ontario and Illinois. The area of lowest barometer has moved from Missouri over Lake Huron and northeastward, with brisk northerly winds on Lake Michigan, and southwesterly winds on the lower lakes, veering to northwest on Lake Erie. Southerly winds now prevail from Virginia to Massachusetts.
Partially cloudy and clear weather, with light westerly winds, prevail west of Michigan and Illinois.
PROBABILITIES.
The area of lowest pressure will probably move northeastward down the St. Lawrence valley, with brisk westerly winds on Lake Ontario, veering to northwest; southerly winds, with rain in New England, and with threatening weather and rain from Pennsylvania to the Gulf; light winds continue on the upper lakes; fresh northwest winds on Lake Erie; rising barometer, with clear weather, extend from the southwest into Wisconsin and Illinois; northerly winds, with cloudy weather, continue from Alabama to Texas.
Cautionary signal is ordered for to-day at Oswego.
REFERENCES.
CLEAR
FAIR
CLOUDY
RAIN
SNOW
Arrow flies with the wind
Scale of English Miles
PUBLISHED BY ORDER OF THE SECRETARY OF WAR.
CUBA
St. DOMINGO I.

Signal Service, and also because the Signal Service had a widespread telegraph system to use in weather reporting.

"On November 1, 1870, at 7:35 a.m., the first systematized synchronous meteoric reports ever taken in the United States were read from the instruments by the observer-sergeants of the signal service at twenty-four stations, and placed upon the telegraphic wires for transmission.

"With the delivery of these reports at Washington, and at the other cities and ports to which it has been arranged that they should be sent, which delivery was made by 9 a.m., commenced the practical working of this division of the signal service in this country." (Chief Signal Officer's Report to the Secretary of War for fiscal year 1871)

From its 24 stations of 1870, the Signal Service grew until, by 1890, it had 26 first-order, 118 second-order, and 34 third-order weather stations. The first- and second-order stations were completely equipped and staffed; third-order stations reported only maximum and minimum temperatures and amounts of precipitation.

In the beginning, each station telegraphed its report to Washington three times a day. In 1898, the number of daily observations was reduced to two, at 8:00 a.m. and 8:00 p.m. After the observations were received, forecasts and maps for the various sections of the country were prepared and issued within two hours. The forecasts were then telegraphed to weather stations, railroad stations, and the Associated Press. At Signal Service stations, the forecasts were printed and sent to post offices, reaching them within five hours after the midnight predictions. Copies were then distributed by mail to rural districts.

Until 1881, official weather forecasts were made only at the central office in Washington. In that year and during part of 1882, the New York observer was allowed to make forecasts. The system of local forecasts did not really begin until 1890, when officers at St. Paul and San Francisco began forecasting for their localities.

The first of the daily weather maps appeared on January 1, 1871, and weather predictions were published regularly after February 19 of that year. The predictions were called "probabilities" until 1889, when the term "forecasts" came into use.

The period between 1870 and 1880 was one of rapidly expanding public services. In 1871, observing and reporting river stages became a function of the Signal Service. General weather services were extended throughout the United States by an appropriation act of 1872 providing for "...expenses of storm signals throughout the United States for the benefit of commerce and agriculture."

In 1874, the 383 cooperative observers still remaining in the Smithsonian's network were transferred to the Signal Service. Weather services for producers of cotton and sugar were inaugurated in 1884. Cooperating with the British Meteorological Office, the Signal Service in 1885 began issuing warnings of Atlantic storms. By 1886, 290 locations were equipped with cold-wave warning flags. Forecasts of cold waves were passed along by telegraph, telephone, and railroad, in an effort to give at least 30 hours' warning.

Cleveland Abbe had been made special assistant to the Chief Signal Officer in 1871. Professor Abbe directed most of the research under the Signal Service. Specific investigations undertaken during these years included studies of tornadoes, moisture in the air, atmospheric electricity, use of balloons, thermometer exposure, and wet-bulb temperature conversion tables.

In 1881, the Signal Service disbursing officer, Captain Henry W. Howgate, was indicted for embezzling $90,000, although it was thought that he had actually taken as much as $237,000. The ensuing scandal greatly lowered the prestige of the Service. In succeeding years, the Signal Service appropriations grew smaller and smaller, causing the closing of 18 stations in 1884. The War Department began an investigation of the operations of the Signal Service. Complaints about weather services became increasingly frequent. Employee morale fell lower and lower. There were many people who urged that the weather service should be a civilian agency. A number of bills to this effect were introduced in Congress, but none were passed until the "Organic Act" of 1890. By this time, the new Department of Agriculture was eager to take over the weather service. The transfer to that department was effected on July 1, 1891, with no interruption of observations or forecasts. For the most part, the Signal Service observers were honorably discharged and remained as civilian employees.

At the time of the transfer, General A.W. Greely, the Chief Signal Officer, wrote:

"In parting from the civil employees the Chief Signal Officer feels assured that the new chief in another department will receive from them the same loyal, faithful, and efficient service they have rendered the Government while serving under his orders. The scientific staff have in view important additional duties looking to the extension of the Weather Service in the interests of agriculture and still further development of the science of meteorology. The Chief Signal Officer will follow with deep interest the development on new scientific lines of weather forecasting and the application of meteorology to agriculture, on which grounds this liberal reorganization of the Weather Bureau was planned and carried out."

On June 30, 1940, the Weather Bureau was transferred from the Department of Agriculture to the Department of Commerce. Explaining the reorganization, President Roosevelt said:

"The development of the aviation industry has imposed upon the Weather Bureau a major responsibility in the field of air transportation. The transfer to the Department of Commerce, as provided in this plan, will permit better coordination of Government activities relating to aviation and to commerce generally without in any way lessening the Bureau's contribution to agriculture."

The Weather Bureau administration building, at 24th and M Streets, N.W., in Washington, D.C. was built during 1940-41. The sixth floor has recently been enlarged (upper right).

FORECASTS AND WARNINGS

In July of 1891 when the Weather Bureau took over from the Signal Corps, all of the major activities of a national weather service were already in operation. These programs included forecasts of general weather conditions, cold-wave and high-wind warnings, storm warnings for coastal and inland shipping, river stage reporting and forecasting, recording the climate, and assistance to agriculture.

In 1891, the Bureau performed all these services with only four forecasters. The number of forecasters rose to 40 within three years, and the Bureau was able to decentralize by creating district forecast centers.

National forecasts were prepared in the Central Office and sent to the district forecast centers. From the district centers, the forecasts went to local stations. Local forecasters were authorized to alter the forecasts to suit local conditions, but their efforts were carefully checked. If anyone missed too often, he was reprimanded or lost the privilege of making forecasts.

From 1891 through 1939, public forecasts were issued twice a day. Forecasts covered the ensuing 36 hours. Beginning in 1898, forecasts based on the evening reports were regularly made for 48 hours in advance.

The forecasting procedure in 1891 was similar to that of earlier years and changed very little until the late 1930's. After the data from the two daily observations were collected, various charts were prepared to show areas of changing barometric pressure, temperature, dew point, and wind speed and direction. Isotherms and isobars were drawn to mark lines of equal temperature and pressure. The movement of high and low barometric pressure areas was studied to determine which areas would receive the advancing weather conditions.

The Weather Bureau did not use the air-mass analysis technique until the latter part of the 1930's, and fronts did not appear on many weather maps until 1936.

The Bureau started experimenting with weekly forecasts in 1908 and began issuing them regularly in 1910. The weekly forecasts were prepared each Saturday, based largely on data received from stations in Alaska, and were very general in nature. These early efforts in extended forecasting were designed to aid farmers in planning their operations for the coming week.

In 1940, the weekly forecast was replaced by the more detailed five-day forecast. After several years of experimentation, the Bureau began issuing its 30-day outlook in 1950.

A central analysis center was created in February 1942 to prepare and distribute master analyses of the upper atmosphere. In 1958, this center became a part of the newly established National Meteorological Center.

In addition to the National Weather Analysis Center, the National Meteorological Center (NMC) includes the Extended Forecast Section and the Joint Numerical Weather Prediction Unit. The NMC provides guidance to the field stations by preparing weather analyses and forecasts for the entire Northern Hemisphere. The National Meteorological Center also conducts an extensive research program designed to improve and automate forecast procedures. Computers and other electronic equipment are used in daily operations to speed the preparation of forecasts.

The NMC's analyses and forecast maps are used extensively by military and private forecasters, as well as by Weather Bureau forecasters. Within the Weather Bureau, NMC material is the starting point for the regional guidance forecasts issued by eight guidance centers, for the state and aviation forecasts issued by 28 area forecast centers, and for the general local forecasts issued by upwards of 300 local service offices. Each of

Mark W. Harrington was the first Chief of the U.S. Weather Bureau, serving from 1891 to 1895. He had been a professor of astronomy and director of the observatory at the University of Michigan. It was Professor Harrington's task to reorganize the weather service along civilian lines.

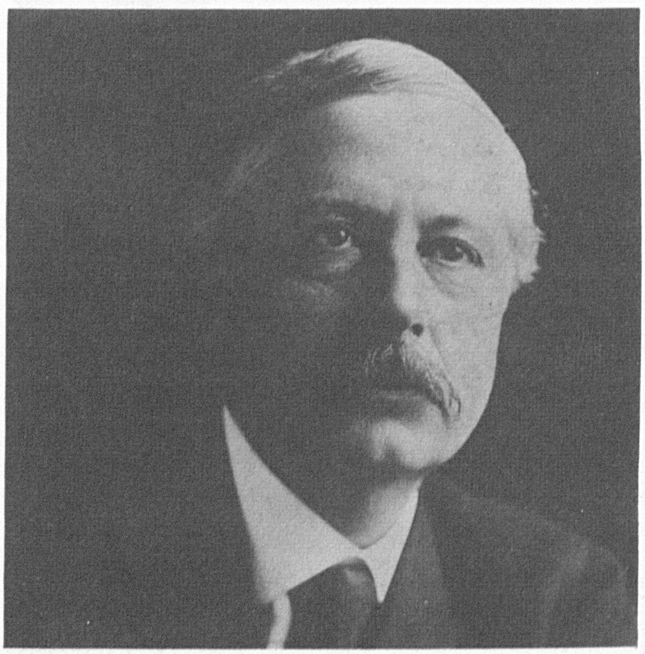
these three groups of offices refines and adapts the NMC material to its geographical area. As the area becomes smaller, the forecasts become more detailed. The field stations are the heart of the Bureau's forecasting and advisory services, disseminating the forecasts to the public and to special interest groups, such as flyers and farmers.

The demand for weather services has expanded many times over since World War II. Aircraft are flying higher and higher, requiring observations and forecasts for greater heights. The coming of the atomic age has created the need for daily forecasts of the fallout pattern in case of enemy attack. The Weather Bureau and the Public Health Service are studying the problems of air pollution created by our industrial society. The beginnings of space exploration have been assisted by special Weather Bureau teams providing forecast services for rocket and satellite launchings.

The Bureau has met these needs and is preparing for the future by enlarging its research program. Intensive studies of the physical processes of the atmosphere will improve methods of forecasting and lead to better services in the years ahead.

Agricultural Services

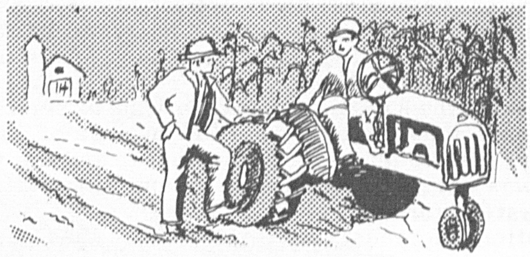
Under the Signal Corps, many weather services were furnished to farmers in addition to general daily forecasts and cold-wave warnings. The Signal Corps provided special information for cotton, rice, corn, and wheat growers and attempted to warn fruit-growers of temperatures lower than 40°.



Willis L. Moore was Chief of the Weather Bureau from 1895 to 1913. He had joined the Signal Service in 1876 and served as a forecaster at Milwaukee and official in charge at Chicago before his selection as Chief.

The Bureau took over and expanded all these programs, adding services for sugar, cranberry, tobacco, alfalfa, truck-farming, and sheep and cattle regions.

The cold-wave warnings were of particular aid to the fruit-growers, even before a special fruit-frost warning service was organized. As early as 1901, a Bureau publication said that "the growers of oranges and other fruits in Florida and California have invested large sums in tents, screens, heating, smudging, and irrigating apparatus for the protection of their groves and orchards, which they put into use when notified by the Bureau of expected occurrence of injuriously low temperatures. The value of the orange bloom, vegetables, and strawberries protected and saved by these means on a single night in February 1901, in a limited district of Florida, through the instrumentality of warnings of freezing weather sent out by the Bureau, was reported at over $100,000."



By 1922, special fruit-frost service was available on the Pacific Coast and in Arizona, New Mexico, New Jersey, New England, Wisconsin, Missouri, Illinois, and Kansas. The service was later extended to Alabama, Florida, and Texas. The fruit-growers take observations from instruments in the groves and send reports to the Bureau, which then issues minimum-temperature forecasts.

In 1958, the Bureau began a special service for farmers in the Mississippi Delta area, providing forecasts tailored to current farming operations and making these available to the press, radio, and TV on a round-the-clock teletypewriter service. The farmers in the Delta region estimated that, during the 1959 crop season, this program enabled them to save more than two million dollars in production costs.

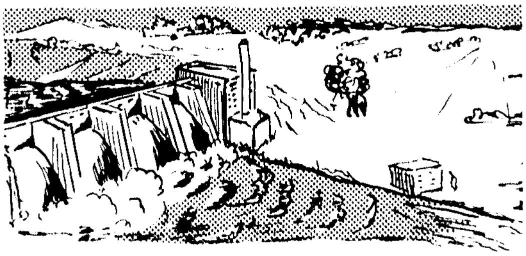
River and Flood Services

In the Bureau's early years, the river and flood forecasting service was greatly expanded. In 1891, daily reports of river stages at 26 places were received in Washington, where forecasters predicted future stages. In 1893, the service was decentralized, and local officials were given forecast responsibility. By 1913, there were 483 stations in the river and flood network.

The early river forecasters did a remarkable job with primitive instruments, no hourly rainfall measurements, and a very thin reporting network.

After the floods of 1903, a Bureau publication reported:

"The flood in the upper Mississippi watershed was the greatest in its history, with the exception of that of 1844, while in many portions of the low-



er watershed the stages were the highest ever known. Yet, notwithstanding the enormous volumes of water, the forecasts and warnings were most specifically accurate, both as to location, stage, and date. Warnings were issued from four days to three weeks in advance, and in no single instance did the forecasted stage differ from that actually recorded by more than four-tenths of a foot. The average difference was about two tenths of a foot."

In these early years, the river forecasting service was confined to the larger, more sluggish streams where reasonably accurate forecasts could be made by rules of thumb. Today, forecasts and warnings are issued for about 1600 localities, including many headwater points with less than 100 square miles of drainage area. Forecasts are now based on reported amounts of rainfall and related factors. After flood waters have collected in headwater channels, the forecasts are revised or confirmed on the basis of reported river stages.

Hurricane Warning Services

In 1896, a destructive hurricane traveled inland from Florida to Pennsylvania. The tremendous losses caused by this storm led to the establishment of our first real hurricane warning service. The headquarters of this service were first in Kingston, Jamaica, then in Havana, and moved to Washington in 1902. The number of stations in the hurricane reporting network was multiplied many times over.

In 1901, a Bureau publication said of the hurricane warning service: "...so nearly perfect has this service become that scarcely a storm of marked danger to maritime interests has occurred for years for which ample warnings have not been issued from twelve to twenty-four hours in advance. The reports from the West Indies are especially valuable in this connection, as they enable the Bureau to forecast with great accuracy the approach of those destructive hurricanes which, during the period from July to October, are liable to sweep the Gulf and Atlantic coasts."

The first hurricane observations radioed from ships at sea were received by the Bureau in 1905. Efforts were made to expand this program to receive observations before storms hit land areas. However, the ships naturally avoided the hurricanes, and the Bureau received few observations until land areas were affected. This problem was never satisfactorily solved until after World War II, when hurricane-hunting aircraft and storm-tracking radar became available.

The hurricane warning system was reorganized in 1935. Forecast centers were established in hurricane areas, and stations in the hurricane network made at least four daily observations and warnings. A teletypewriter network, linking coastal cities, was installed.

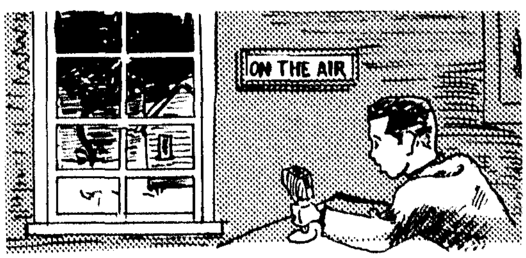
The destruction caused by three tropical storms in 1954 provided new impetus for improving the hurricane warning service. Emergency warning centers were established at major Weather Bureau stations along the coast. More frequent reconnaissance flights were made. The Bureau began installation of high-powered radars along the coastline to detect and track hurricanes. A program of education was begun to ensure better public understanding of hurricanes and hurricane warnings.

In 1956, with the establishment of the National Hurricane Research Project, the Bureau began its first major study of hurricanes. This program, which continues to the present day, gives promise of eventual understanding of all the forces involved in hurricanes.

Severe Storms

As early as 1884, Signal Corps forecasters attempted to predict the occurrence of tornadoes, but their efforts do not appear to have been too successful. In the first years of the Weather Bureau, forecasters were not permitted to issue public tornado forecasts for fear of causing panic.

The ability to make accurate forecasts of severe storms had to await the development of modern methods of upper-air observation and air-mass analysis. In 1952, the Weather Bureau established a severe local storm forecast center. The center,



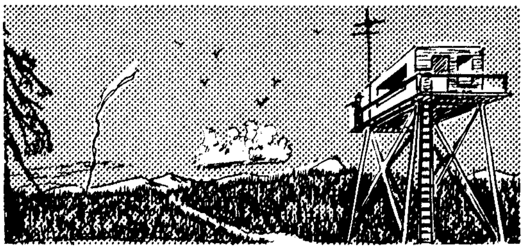
which is now located in Kansas City, is responsible for forecasting such dangerous storms as tornadoes or thunderstorms accompanied by severe lightning, strong winds, or damaging hail. Severe storm forecasts for the entire nation originate in this unit.

The Bureau makes extensive use of radar in detecting and tracking severe storms and has also set up 185 volunteer reporting networks to warn of storms' movements in local areas.

An intensive study of severe storms was begun in 1960. The data gathered in this research project will bring greater understanding of these destructive storms and will lead to improved methods of prediction.

Fire Weather Services

The fire weather service was started during the First World War, in an effort to preserve the nation's timber resources. Until 1926, the service was very small, with only two employees assigned to it on a part-time basis. Today, 37 Bureau offices provide fire-weather service. Forest ranger stations are equipped with weather instruments



and make three daily reports to the nearest Bureau station. The forecasters then rate the danger of fire on a numerical scale. The Bureau advises the Forest Service of dry atmospheric conditions and gives special attention to forecasting dry thunderstorms, which have been the cause of many forest fires. Mobile weather stations travel to the scene of forest fires to advise fire-fighters of possible rain or changes in wind speed and direction.

Climatology

In the early years of the Bureau, gathering and studying records of the climate was one of its most urgent duties. Americans were moving westward to establish homes in little-known regions and wanted to know what to look for in the way of heat and cold, rain and snow, and the ordinary run of the weather. Congress asked the Bureau to "establish the climate," thinking perhaps that a record of 20 or 30 years would show climatic conditions presumed to be more or less permanently fixed. We know now that the climate is not fixed, but climatic data are even more useful in the modern era--for business, for agriculture, and for defense.

Records of climate are obtained from the Bureau's own stations and from a network of cooperative observers. The number of cooperative observers has grown from 3000 during the 1890's to more than 12,000.

In 1934, funds received from the Civil Works Administration enabled the Bureau to establish a tabulating unit in New Orleans and to begin the machine-processing of past weather records. In 1936, the Bureau began card-punching surface and upper-air data received from airway weather stations. The activities of the New Orleans tabulating unit were transferred to Asheville, North Carolina, in 1951, when the National Weather Records Center was established there. The National Weather Records Center is the final repository for all weather records collected in the United States.

Aviation Services

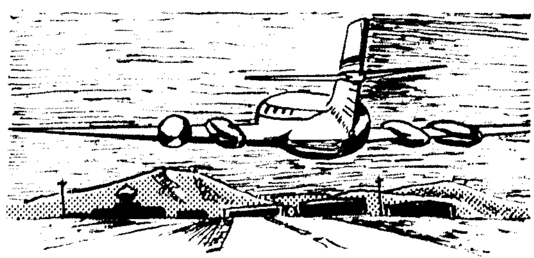
The Weather Bureau's services to aviation began in 1902 when it made a study of the surface winds at Kitty Hawk for the Wright brothers. During the early development of the airplane, the Bureau provided special service for many individual flights.

The Bureau's aerological work was expanded during World War I to aid military flyers and, in 1918, special bulletins and forecasts were issued for military aviation.

Initiation of air mail flights by the Post Office Department brought a continuing need for aviation weather service. In 1919, daily flying weather forecasts were begun for the benefit of the Post Office and military aviation. These forecasts were prepared in Washington at 9:30 a.m. and 9:30 p.m. and covered thirteen separate districts. The brief bulletins included current and expected weather conditions -- cloudiness, visibility, wind direction and speed -- and in many cases suggested the best altitude for flying. No night aviation forecasts were made until 1924, and ceiling and visibility were not included in the forecasts until 1929.

The Bureau established its first flight forecast centers at Chicago, Washington, and San Francisco in 1920.

The Air Commerce Act of 1926 made the Bureau responsible for weather services to civilian aviation. "It shall be the duty of the Chief of the Weather Bureau... (a) to furnish such weather reports, forecasts, warnings, and advices as may be required to promote the safety and efficiency of



air navigation in the United States and above the high seas, particularly upon the civil airways designated by the Secretary of Commerce under authority of law as routes suitable for air commerce, and (b) for such purposes to observe, measure, and investigate atmospheric phenomena, and establish meteorological offices and stations."

After the passage of this legislation, Weather Bureau Airport Stations were opened along all major air routes. By 1928, there were 18 airport stations. This grew to 50 by 1930, and today there are 247 Weather Bureau Airport Stations providing weather information to the pilot.

In 1929, the aviation weather reporting system was expanded further, and a system of three-hourly synoptic reports was begun. The number of airway stations along flight routes was increased greatly, many providing 24-hour service and others providing only service for scheduled flights.

Forecast centers were established at certain airport stations in 1931. Surrounding stations sent observations to the forecast centers every three hours. Weather maps were constructed in the forecast center, and short-range forecasts were issued. These forecasts were broadcast regularly from Department of Commerce stations along major air routes.

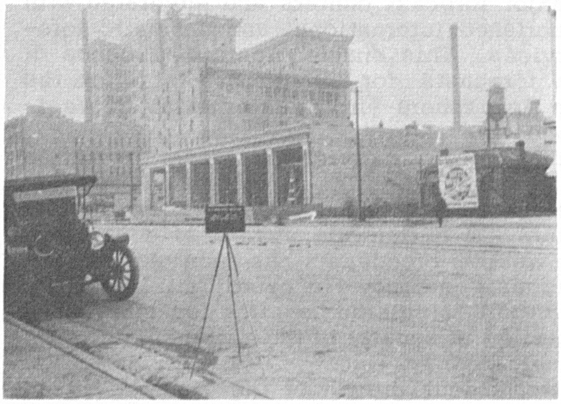
With the approach of World War II, traffic on the major civil airways reached a point requiring control from the ground, and by the end of the war each of the 26 Air Route Traffic Control Centers was supported by a Flight Advisory Weather Service center.

High-altitude service was added in 1959 at seven major forecast centers and integrated with the established international and domestic forecast services. This enabled routine issuance of aviation forecasts for about one-third of the Northern Hemisphere--from Eastern Asia to Western Europe.

Weather briefing services for general aviation have been expanded by the establishment of automatic telephone answering systems at major traffic centers. A nationwide system of continuous aviation weather broadcasts has been started, and 45 broadcasts are now in operation. Recently, closed circuit television briefing systems have been installed at several of the busier international terminals.

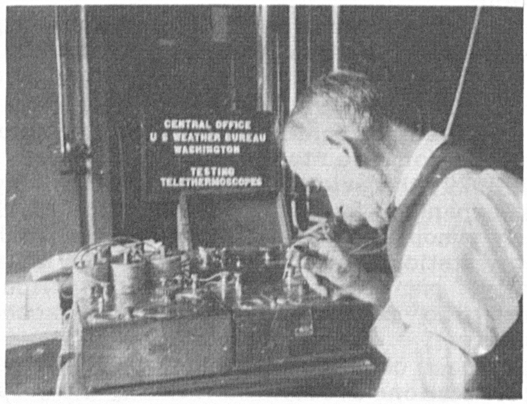
The tremendous growth of the Weather Bureau in the last 35 years has been due primarily to the expansion of aviation. The growth of aviation and the ever-increasing performance capabilities of aircraft have required the formation of new reporting networks, communication networks, and a special forecasting organization. The Bureau's growth over these years is indicated by the increase in appropriations from two million dollars in 1925 to 57 million dollars in 1961, the increase in personnel from 1,023 in 1930 to 4,754 in 1960, and the increase from 210 stations to 314 over the same period.

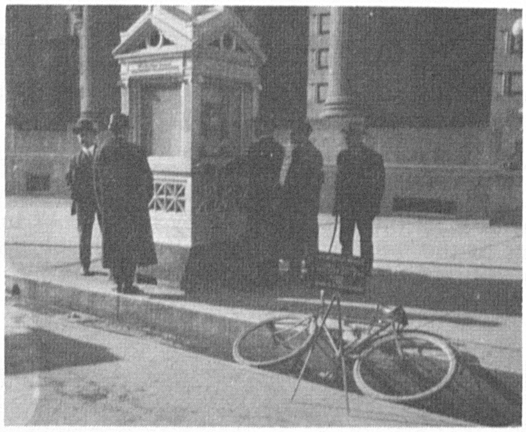
The old Central Office building was acquired by the Signal Corps in 1888 and is still in use today. Its interior decorations indicate that the building may have been intended for use as a Central American embassy.



Weather Bureau Office   Salt Lake City

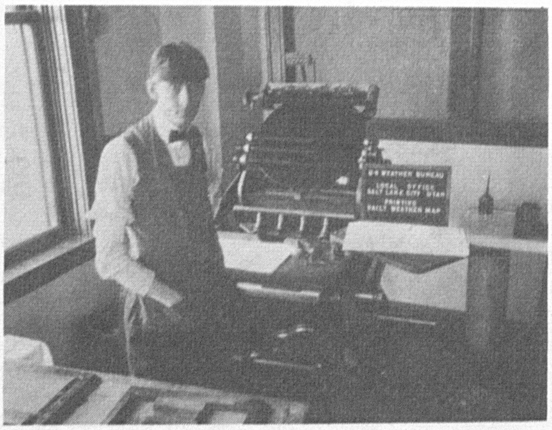
A Weather Bureau Office in 1914



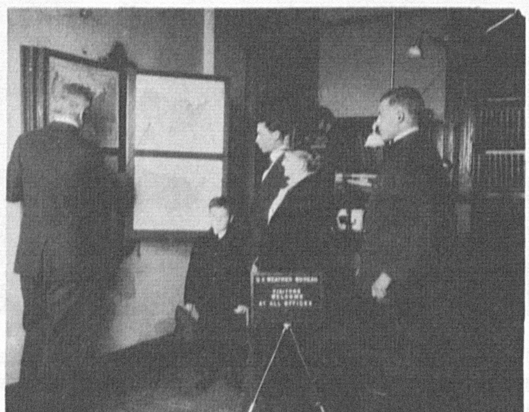


Sidewalk Kiosks Contained Weather Instruments

Printing the Daily Weather Map

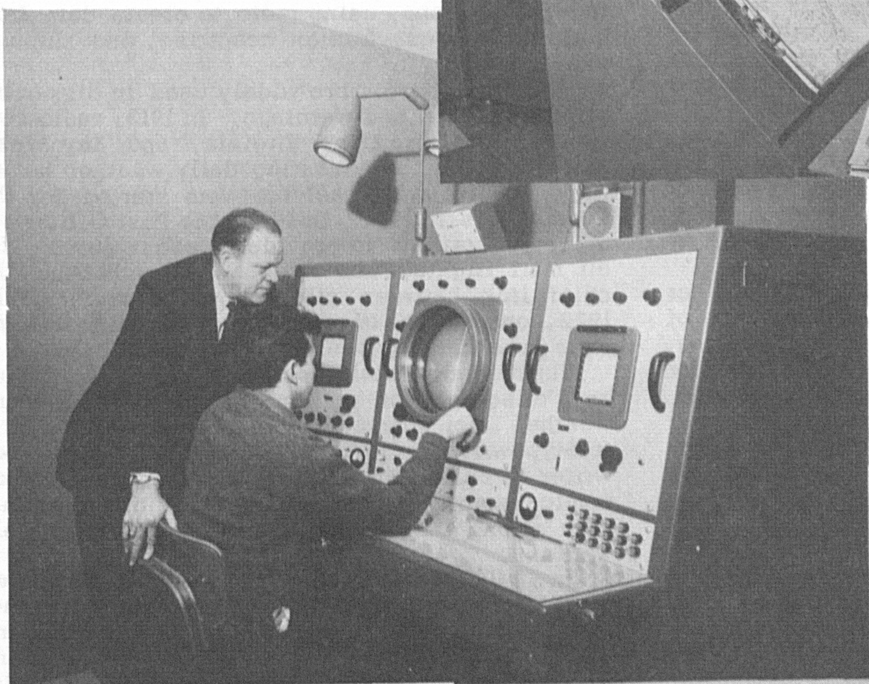


Forecasting for Visitors



Forecasting and Briefing Room

Radar Console



. . . and in 1961

Teletypewriters

Two lower photographs by the Port of New York Authority

COMMUNICATIONS –

From Telegraph to Television

Modern methods of communication are the backbone of any national weather service. Observations must be collected from all over the world and forecasts and maps distributed to the users. The usefulness of the Weather Bureau's services is directly related to the speed of communications, and the advent of radio, telephone, teletypewriter, facsimile, and television has enabled the Bureau to reach more people, faster, with greater effectiveness than ever before.

Under the Signal Corps, weather observations were sent by telegraph to Washington, and the forecasts prepared there were telegraphed to the field. Display flags were flown at Signal Corps stations and in public places to indicate expected precipitation and rising, falling, or steady temperatures. Weather information was also printed in the newspapers, with the first newspaper weather map appearing in 1879.

After 1891, the Weather Bureau continued to use the signal flags, and whistles, searchlights, sirens, and rockets were also employed to warn of severe weather or cold waves. Observations were still collected and forecasts disseminated by telegraph.

A system of telegraph circuits was used for collecting weather observations from all parts of the nation. From 8 to 9:30, morning and evening, telegraph lines in each circuit were held open for weather dispatches. When transmission began, all the men on each circuit were ready with their messages. When one finished, the next began transmitting, until all stations on the circuit had been heard from. Each operator on the circuit took down all the dispatches passing over it.

When one circuit finished its dispatches, another joined it, transmitting its own messages and collecting all the accumulated reports. In this way, weather observations were transmitted to the central office in Washington and to all stations directly connected to the circuits.

A 1901 Bureau publication explained the methods then used to get the forecasts to the public:

"Within two hours after the morning observations have been taken, the forecasts are telegraphed from the forecast centers to about 1,000 principal distributing points, when they are further disseminated by telegraph, telephone, and mail. In this manner the forecasts reach about 80,000 addresses daily, the greater part being delivered early in the day, and none later, as a rule, than 6 p.m. of the day of issue.... The rural free mail delivery system recently inaugurated, and which is being rapidly extended, will afford a means of bringing within the benefits of this system a large number of farming communities heretofore impracticable to reach with the daily forecasts."

In the early 1900's, the use of the telephone was spreading. Forecasts were given to telephone operators who read them to subscribers upon request, thus reaching many agricultural areas much earlier than the mailed forecasts.

Forecasts were displayed in public places by means of the signal flags, and weather maps and bulletins were posted in hotels, stores, office buildings, post offices, and railway stations throughout the nation.

In 1899, Marconi demonstrated the possibilities of wireless telegraphy by sending messages across the English Channel. The Weather Bureau was immediately interested and became the first agency of the United States government to experiment with its use. However, the Bureau continued to rely on the telegraph and telephone for collecting observations, using radio to obtain data from outlying regions, foreign countries, and ships at sea.

Radio has been more widely used in disseminating forecasts and warnings. In 1913, radio stations in Arlington, Virginia, and Key West, Florida, began broadcasting daily weather bulletins, and a similar service was started for the Great Lakes in 1914. In 1920, the Post Office set up radio stations to provide forecast service for air mail flights, and radio has now become the chief link between pilots and forecasters. By 1922, one-fourth of the nation's radio stations were broadcasting weather information.

The Bureau's total dependence on the telephone and telegraph for collecting and disseminating weather information ended in 1928 when its first teletypewriter circuits were installed. Teletypewriter circuits have proved to be the most economical means of transmitting basic observational data among the hundreds of Weather Bureau field stations.

In 1948, the teletypewriter was supplemented by facsimile transmission, a wirephoto technique. Facsimile is used to transmit analyzed maps and charts from analysis centers to weather stations in the field. Prior to the introduction of facsimile, the staff at each field station had to plot and analyze maps before preparing a forecast.

Today, newspapers, telephone, television, and radio are all used to bring forecasts to the public. Automatic telephone weather forecast service began in 1939 and is now available in eleven cities. Automatic telephone answering systems are being installed at 50 airport stations to disseminate weather information to pilots. Americans everywhere hear weather forecasts regularly on radio and watch them on television.

Television has recently acquired two other uses in communicating weather information. The first closed circuit television pilot weather briefing service is now in operation at New York International Airport. And it is television that has given us a new perspective on the weather through cloud photographs from the TIROS weather satellites.

INSTRUMENTS AND OBSERVATIONS

In 1870, when the national weather service was established under the Signal Corps, meteorologists had only surface weather observations to use in forecasting the behavior of an active atmosphere many miles in depth.

The instruments then available for weather observation were the wind vane, anemometer, nonrecording rain gage, thermometer, barometer, maximum and minimum thermometer, and sling psychrometer. The Signal Corps had no self-recording instruments except those for measuring wind movement and some recording rain gages in the central office.

Using these instruments, the weathermen recorded the maximum and minimum temperature, the humidity, the barometric pressure, the rainfall, and the direction and speed of the wind. They also reported the types of cloud present, the state of the weather, and the appearance of the aurora borealis, dew, white frost, the first and last frosts, fog, thunderstorms, hail, tornadoes, landspouts, fireballs, rainbows, and shooting stars. Three daily observations were made until 1888, when the schedule was changed to two observations a day--at 8 a.m. and 8 p.m.

For many years after the transfer of the weather service to the Department of Agriculture, there was little change in the observation program, except that the number of observing stations continued to increase. In 1897, Chief Moore wrote in his annual report to the Secretary of Agriculture: "From a knowledge personally gained by many years service as an official forecaster, I do not hesitate to express the opinion that we have reached the highest degree of accuracy in the making of forecasts and storm warnings possible to obtain with surface readings only."

Under the leadership of Professor Charles F. Marvin, who was later to become Chief of the Weather Bureau, many instruments were developed and improved during the last ten years of the nineteenth century. Marvin worked particularly on the development of self-recording instruments. He perfected the kite meteorograph for recording wind velocity, temperature, barometric pressure, and relative humidity in the upper air. Other Marvin inventions were the weekly float rain gage, the shielded snow gage, and an electrical-resistance thermometer for measuring the intensity of solar radiation in absolute units of heat.

The triple-register recording device, which came into general use during the 1890's, was a means of recording several types of observation simultaneously. The register was connected to the tipping-bucket rain gage, the sunshine recorder, the anemometer, and the wind vane, and observations were recorded on charts driven by a clock.

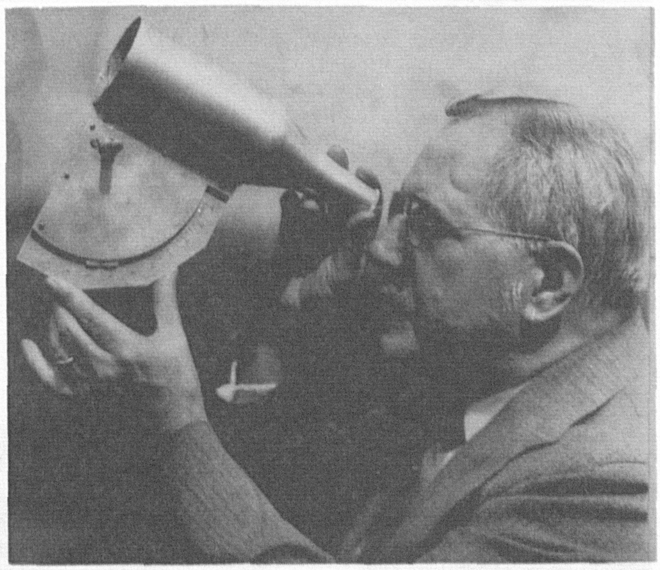
The great revolution in weather observing came with the growth of aviation. An intensive program of upper-air observations had to be developed to meet the pilot's need for knowledge of the weather above the earth.

The early efforts to probe the upper air were intended only to increase man's knowledge of the atmosphere and not for use in forecasting. Even in 1915, a Bureau publication stated that "the value of this aerological work does not lie so much in the current use of the data, though many of the observations are individually useful, as in the light thrown by these data on the whole subject of dynamic meteorology."

As early as 1784, manned balloons were used to observe the weather, and this method of research was used a number of times by the Signal Corps. The Signal Corps also established weather stations at Pike's Peak and other elevated points to obtain information at high levels.

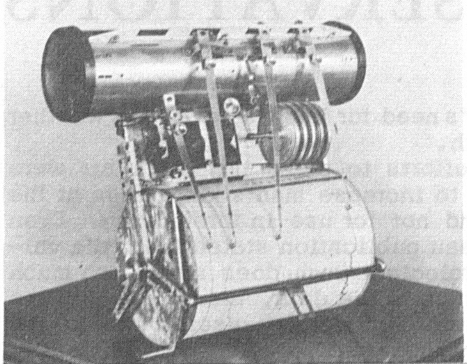
In 1895, Professor Marvin began using kites to make observations, and within a year he had perfected his kite meteorograph. It was difficult to obtain a continuous record of kite observations, because a wind speed of 10 to 15 miles per hour was needed to raise the kites to 1000 feet. Even so, the kite was more practical than the manned balloon. In 1898, the Bureau made a series of simultaneous kite observations at 17 stations, and a regularly scheduled program of kite observations began in 1907. The program continued until 1933, when it was superseded by airplane observations.

In 1931, a Bureau publication described the kite observations: "Kites (box type) are flown in tandem from steel music wire. The head kite carries



Charles F. Marvin uses a clinometer, one of the many weather instruments he developed. Professor Marvin joined the weather service when it was part of the Signal Corps and was Chief of the Weather Bureau from 1913 to 1934.

KITE OBSERVATIONS



Top: A kite meteorograph

Center: The building at the right was called a reel house and contained a mechanical reel for pulling in the kite. When the kite line broke, a truck was used to chase the kite. A portable reel, such as the one in the center, pulled the kite back to earth.

Bottom: Launching a kite

a meteorograph and by using from six to eight kites, heights of two miles and occasionally four miles are reached." Each flight required four to five hours.

Captive balloons, inflated with hydrogen, were used for probing the lower layers of the atmosphere when winds were too light to lift the kites.

In 1909, the Bureau began a regular program of free balloon observations. Two balloons would be launched at the same time, one in the center of a storm and another to the east of the storm. These were the forerunners of the modern pilot balloon observations. The pilot balloon carries no instruments, but the wind direction and speed at various heights can be quickly determined by following the balloon with a theodolite.

Even before World War I, parachutes and meteorographs were attached to pilot balloons to convert them into sounding balloons. The sounding balloons were described in a 1931 Bureau publication: "Sounding balloons are usually five feet or more in diameter and carry a self-recording instrument (meteorograph). The balloon rises until it bursts, and the meteorograph then descends with a parachute. Continuous records of temperature, pressure, and humidity are thus obtained to a height of 10 to 12 miles and occasionally to 20 miles. The instrument carries a tag on which the finder is requested to send it to the Weather Bureau office.... The chief disadvantage of sounding balloons is that the records are frequently not available until days, weeks, or perhaps months later."

An extensive program for sounding-balloon observations was presented to Congress in 1919, but the necessary appropriations were not passed.

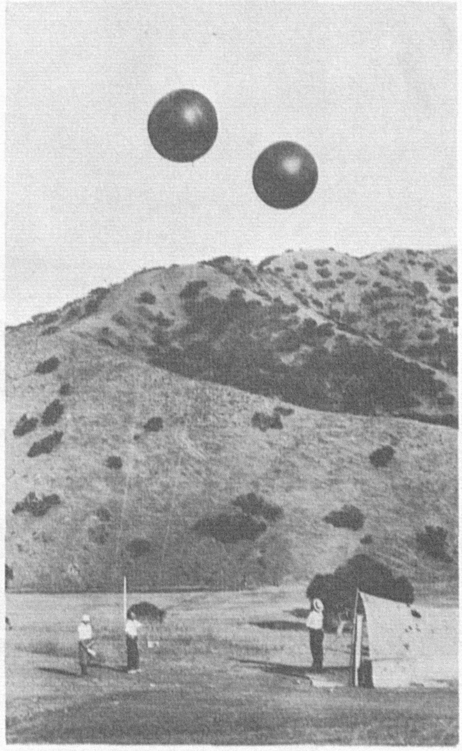
The Bureau's upper-air investigations expanded rapidly during World War I in response to the needs of the War and Navy Departments. In the years following the war, Congress authorized further expansion for the benefit of commercial aviation.

The Weather Bureau began experimenting with airplane observations in 1919. A Marvin meteorograph was attached to the struts of a plane to measure temperature, pressure, and humidity.

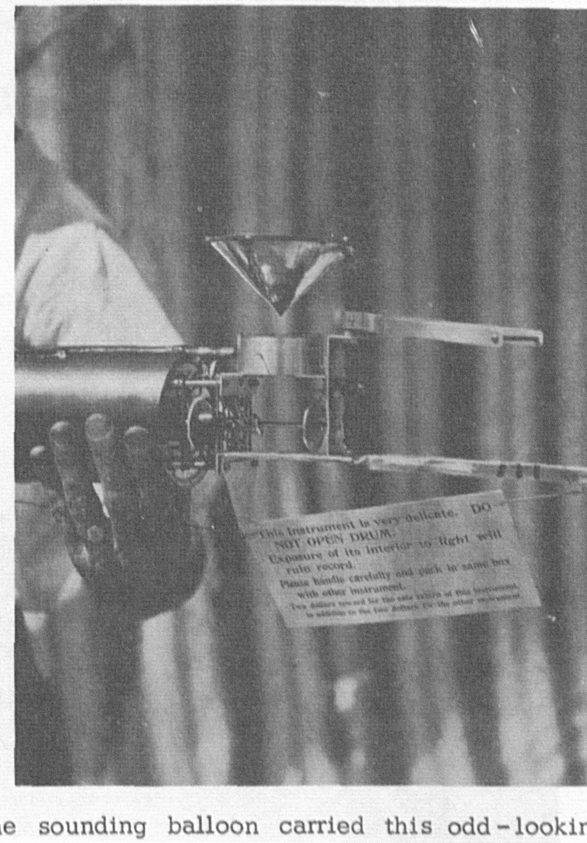
Six years later, with the cooperation of the Navy's Bureau of Aeronautics, daily airplane observations were made at Washington, D.C. In 1931, a regular program of early morning airplane observations was inaugurated at Chicago, Cleveland, Dallas, and Omaha. By 1937, airplane observations were made regularly in thirty places. A complete flight required less than one hour, and the data collected by the meteorograph were almost immediately available for the forecaster. The pilots also observed cloud formation and height, visibility at different heights, and turbulence.

The airplane observations were expensive and dangerous. Between 1931 and 1938, they cost the lives of twelve pilots. For these reasons, and because of the improvement of the sounding balloon, airplane observations were discontinued before World War II.

In 1927, two Frenchmen attached a radio trans-



Launching a sounding balloon



The sounding balloon carried this odd-looking instrument.

Navy pilots make an airplane observation. The meteorograph can be seen between the struts of the plane.

Willis R. Gregg, Chief of the Weather Bureau from 1934 to 1938, attaches an aero-meteorograph to a plane. Mr. Gregg entered the Bureau as an observer in 1902 and spent a number of years in the kite observation program. From 1917 until his appointment in 1934, he was chief of the Bureau's aerological division.

mitter to a free balloon and succeeded in establishing a radio link with the atmosphere. A year later, the Russian meteorologist, Moltchanoff, attached a radio transmitter to a sounding balloon and achieved the first successful flight with what was then called a "radio meteorograph." This designation was changed to "radiosonde" in 1938.

The radiosonde was first used by the Weather Bureau in 1936. It was found to be less expensive than the airplane observation and attained greater heights. In 1938, daily radiosonde observations were started at six Bureau stations.

The radiosonde measures pressure, temperature, and humidity and transmits the measurements to earth by means of radio signals. Wind direction and speed can be determined by tracking the radiosonde with a radio direction finder. A parachute is attached to the instrument to permit recovery after the balloon has burst.

The aviation age also brought an increase in the Bureau's program of surface observations. Many new Weather Bureau Airport Stations were opened, and a network of hourly observing stations was established to report to pilots on the weather along the air routes and at the landing fields.

In 1961, the Bureau's observing network includes 314 regular Weather Bureau stations, 146 upper-air weather sounding stations, 91 radar stations, 20 automatic weather stations, and more than 12,000 cooperative observers who report on river stages and the climate. In addition, there are 229 FAA stations making hourly reports and 256 supplementary aviation weather reporting stations, manned by airline or airport personnel. More than 3000 ships cooperate by observing and reporting on the weather at sea. By international agreement, the Bureau receives regular observations from more than 2000 foreign weather stations.

Today, complete synoptic measurements are made four times daily at six-hour intervals, and abbreviated measurements at intermediate three-hour intervals. Surface readings are taken every hour and entered on punched cards for a permanent record. When the ceiling is lower than 500 feet and visibility less than one mile, observations are made every 15 minutes.

In recent years, new instruments have been added to the weatherman's arsenal to improve his ability to observe the behavior of the weather.

After World War II, the Bureau acquired a number of war-surplus radars for tracking the movements of rain areas, storms, and squall lines. Twenty-two additional radar sets, especially designed for weather surveillance, are now in operation, and nine more of these are scheduled for installation in the near future.

An automatic observing station, that makes weather measurements and transmits them by teletypewriter, was first placed in operation in 1954. These automatic observers can be used to obtain weather information in remote areas or at sea.

Rockets are being used to study the upper air, and now the TIROS satellites have inaugurated a new era in weather observing. For the first time, man can view the weather from above. In the future, with a number of satellites operating at the same time, the meteorologist will be able to keep a continuous watch on the weather all over the world.

An early radio-meteorograph of the Moltchanoff type. The old caption on the picture explains that the instrument is "primarily for use in sparsely settled regions where the autographic type of meteorograph is impracticable owing to the unlikelihood of its being found and returned."

Acknowledgments

We wish to thank Miss Marjorie A. Clark of the Weather Bureau Library for her gracious assistance in locating material on the Bureau's history.

One of the most helpful sources of information has been a new book by Donald R. Whitnah, A History of the United States Weather Bureau. This book, published in 1961 by the University of Illinois Press, is recommended reading for anyone interested in more details of the Bureau's history.

Another excellent source of historical material has been a thesis prepared by Mr. Ernest L. Kvam, Chief of the Administrative Operations Division, on "The Evolution of the U.S. Weather Bureau in Meeting the Needs of Radically Changing Times."

TOPICS' regular features--such as Meteorological Readings, Topigrams, and personnel items--have been omitted from this special issue. They will all be continued in June TOPICS.

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WEATHER BUREAU
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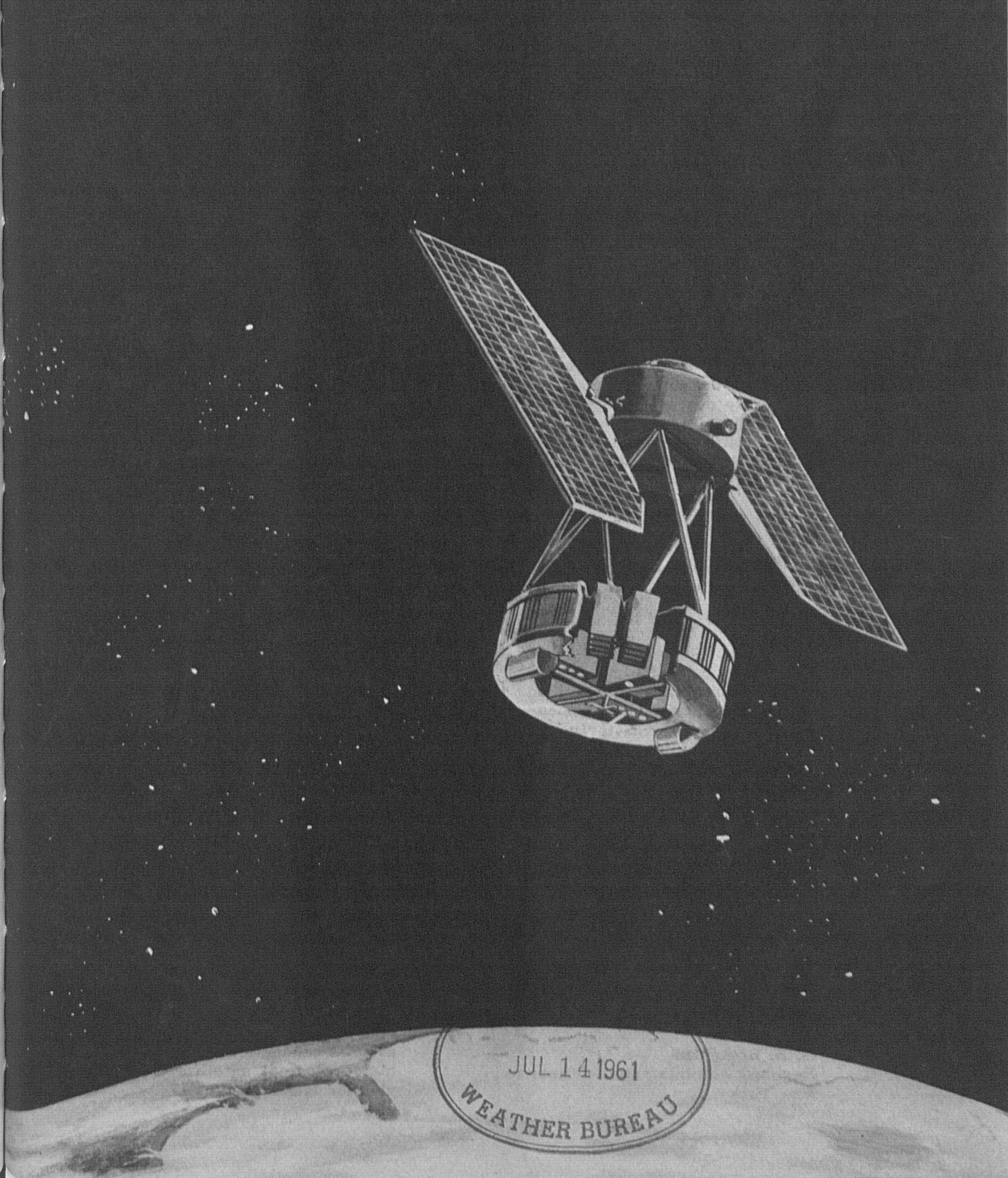
TOPICS



Secretary Hodges Congratulates Bureau On 70th Anniversary

Secretary of Commerce Luther H. Hodges has congratulated the Weather Bureau on reaching its 70th birthday as a civilian agency. No other agency of government, he said, is put to the test of its ability with such frequency and comes out with such high grades.

In a congratulatory message to Dr. F. W. Reichelderfer, the Secretary said:

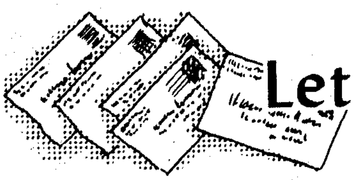
"Congratulations to you and your staff on your agency's reaching the fine old Biblical age of three score and ten. The United States has reason to be proud of the progress you have made in these years. We are even prouder of the way the old man of 70 has clambered aboard space vehicles to keep pace with the developments of this new age.

"With almost everyone in the country considering himself a weather observer of some sort, no other agency of the government is put to the test of its ability day after day as you are in your weather forecasting. And you usually come through the test with flying colors. I am glad to have this occasion to say publicly what a fine job you are doing. In response, the least you can do is promise us all a spell of good weather for the Fourth of July weekend!"

Commenting on the anniversary, Dr. Reichelderfer said:

"Technological advances have given us improved instruments for observing the weather, faster means of communicating observations and forecasts, and electronic equipment to speed the job of forecasting. Through research programs we have acquired more knowledge of weather processes. These developments have enabled us to improve our forecasts and to keep pace with the ever-growing needs for weather services to business, agriculture, aviation, and the general public.

"Practically every modern advance in aeronautics, agriculture, business, commerce, engineering, industry, or transportation has involved new demands for knowledge of the weather and the climate. The Weather Bureau, with its new forecasting equipment, is preparing to meet the greater demands that the future will bring."



Letters to the Editor

A survey was recently conducted in Region One to ascertain the percentage of assigned employees who were pursuing further educational courses in connection with their respective positions. The results were indeed gratifying and reflected a sincere desire and interest on the part of the employees in furthering their technical backgrounds. Of the 752 replies received, 61 percent were currently participating in formalized training, of which 31 percent were at a college level; 26 percent of the employees indicated that they have already planned for courses for the next semester and only 12 percent were not contemplating any formalized education. The major portion of the above mentioned 12 percent were in the stenographic and clerical category. This survey also served to indicate that the Weather Bureau Training Program Agenda is sufficiently varied to provide all areas of study.

L. E. Brotzman
Regional Administrative Officer
New York

THE EDITOR'S MAILBOX IS EMPTY!

Very few Letters to the Editor have been received since our request was printed in February. We had hoped to inspire a lively exchange of opinion on Weather Bureau programs and activities. If you wish the column to continue, let us hear from you.

(The picture on the cover is an artist's conception of the Nimbus meteorological satellite, scheduled for launch in 1962.)

Topigrams

Washington, D.C.
June, 1961

Radiation measurements by TIROS II terminated during April. In conjunction with the National Aeronautics and Space Administration, processing of radiation data from TIROS II was begun on May 15. The satellite continues to transmit photographs. Special Indian Ocean cloud pictures and nephanalyses were provided in support of the abortive Project Mercury launch of April 25. Interrogation of TIROS II, for research purposes only, will continue at Point Mugu, California. The readout station at Belmar, New Jersey, has been closed, and the new station at Wallops Island, Virginia, will be ready later this month.

Plans for a supplementary observations program during TIROS III operations have been started. Some 200 radiometersondes have been ordered and will be sent to 21 upper-air stations for special observations in connection with the radiation experiment on the satellite. The Army and the Navy will cooperate in supplemental observations.

The 13th Session of the WMO Executive Committee was held in Geneva from May 11 to 30. Weather Bureau participants were Dr. Reichelderfer, P.H. Kutschenreuter (Assistant Chief for Technical Services), M.A. Kohler (Chief Research Hydrologist), and A.W. Johnson (Office of International Meteorological Plans). Among the matters discussed by the Executive Committee were the processing of meteorological data for research, international distribution of satellite data, the programs of Regional Associations and Technical Commissions, and the plans and budget for next year.

Since January, pilots' automatic telephone weather answering services have been added at Newark, Buffalo, and Houston. This brings the total to 34 and completes the program authorized for fiscal year 1960. Thirteen continuous transcribed weather broadcasts on FAA L/MF radio facilities have been placed in operation since January, bringing the total to 47.

Jerome Namias, Chief of the Extended Forecast Section, will spend six weeks, from June 23 to August 5, as a Visiting Professor at the National University in Mexico City. He will lecture at the University's Institute of Geophysics on climatic fluctuations germane to long-range forecasting.

Weather Bureau facilities in Houston, Texas, were consolidated on March 31. Public service and other activities, except substation inspection and the marine weather program, were removed from the downtown office to the Weather Bureau Airport Station at Houston International Airport. Marine and substation activities are still located in the Federal Building in downtown Houston.

The Approach Light Contact Height (ALCH) operational test unit at Newark Airport will close June 30. A Weather Bureau research group at the National Aviation Facilities Experimental Center in Atlantic City is continuing to evaluate ALCH.

Briefs from the CO Staff Conferences

The Chief of Bureau discussed the content and implications of Senate Bill 1577 (the Case bill). This bill, introduced by Senator Case on April 13, would create a National Weather Council to coordinate an accelerated program of weather research. The Council would be composed of the Chief of the Weather Bureau (Chairman), the Director of the National Science Foundation, the Administrator of the National Aeronautics and Space Administration, and the Secretaries of Agriculture, Interior, Army, Navy, and Air Force, or their designated representatives. Under the bill, $100,000,000 would be appropriated during the current fiscal year to carry out the purposes of the Council. A reply will be drafted, endorsing the objectives of the bill in principle and suggesting certain changes in wording, but stating that at the same time the scientific goals sought in the bill are attainable under existing executive authority and organization.

The Federal Aviation Agency is preparing new regulations imposing limitations on the use of kites, moored balloons, free balloons, and rockets. Arrangements have been made for the FAA to test the effect of the impact of a rawinsonde instrument on a plane. O&SF is preparing a reply to the FAA on the proposed regulations.

New quarters for the Meteorological Satellite Laboratory in Suitland, Maryland, should be completed by October 15. A second floor is now proposed for the new wing, to house the Panel on Operational Meteorological Satellites.

Division Progress Reports

1. Observations and Station Facilities Division: Most "E" programs are progressing normally. The radiotheodolite and end-of-runway equipment is on schedule.

2. Office of Climatology: Regular programs are progressing according to plan. Preparations are going forward for handling a massive influx of satellite data. The Honeywell 800 computer at NWRC will be ready for use soon.

The instability of stations is a problem of growing concern to climatology. Moves from cities to airports have resulted in sites that no longer reflect the conditions under which most people live. Large users of climatological data are not interested in airport data.

3. Forecasts and Synoptic Reports Division: Discussing the general dissatisfaction with Service A since ADIS (Automatic Data Interchange System) went into effect, Mr. Vernon pointed out that the system is sufficiently flexible to deliver weather data in a sequence more acceptable to users without delaying the receipt of data unduly. The Weather Bureau is working with the FAA and aviation interests to correct some of the weaknesses of the system. Steps planned include elimination of priorities in area collections and the development of a logical, geographical order for a single block of reports from each area circuit. Notices concerning changes are being transmitted on Service A at intervals.

Panel Plans Weather Satellite System

A plan for the establishment of an operational weather satellite system has recently been proposed by a panel of the National Coordinating Committee for Aviation Meteorology. The Weather Bureau, the National Aeronautics and Space Administration, the Federal Aviation Agency, the Army, the Air Force, and the Navy are represented on the Panel on Operational Meteorological Satellites.

The Panel recommended that a National Operational Meteorological Satellite System should be developed at the earliest possible date. This operational system would serve the international community of nations. Initially, the reduced and analyzed products of the global observations would be disseminated internationally through WMO channels. Later, equipment may be developed that will permit any nation or any weather station to obtain cloud pictures for its immediate vicinity directly from the satellite.

The Panel on Operational Meteorological Satellites also recommended that the Weather Bureau should have overall management responsibility for the new satellite system. A new office, to be established in the Weather Bureau, would be responsible for the acquisition, communication, processing, analysis, and dissemination of satellite data.

Development and procurement of spacecraft and launch vehicles, and the actual conduct of launch operations, would be handled by the National Aeronautics and Space Administration, under contract to the Department of Commerce. NASA would also participate in spacecraft control and programing and in data acquisition.

The military services and other users of weather information would participate in the program through an interagency coordinating group and would maintain a resident liaison office in the Weather Bureau.

The Panel recommended that the TIROS program should be extended to provide some operational capability before the Nimbus program begins.

President Requests $53 Million For Operational Weather Satellites

In his message to the joint session of Congress on May 25, the President asked for an additional half billion dollars for the national space effort. Included in the President's request was a $53 million appropriation for the Weather Bureau, to be used in establishing an operational meteorological satellite system as proposed by the Panel on Operational Meteorological Satellites. The request has not yet been acted upon by the House and the Senate.

If approved by Congress, a portion of the funds would be used to purchase three additional Nimbus spacecraft and four launch vehicles.

Separate command and data acquisition facilities would be constructed at Fairbanks, Alaska, for use in the operational program. The station now being constructed at Fairbanks by the National Aeronautics and Space Administration is designed for use in research and development work and would not be capable of handling the additional load created by an operational program.

The request also includes funds for constructing and equipping another data acquisition station on the east coast of the United States.

The requested funds would support central data processing, analysis, and technical management. Specialized equipment is required at the acquisition stations to convert the electronic signals received from the Nimbus satellite into suitable form for further processing and analysis at the National Meteorological Center. The appropriation would provide for the purchase of such equipment as data processers and line drawers required for computer input and output.

Phase I

(Mid-1962 through December 1963)

Phase I of the operational system, as proposed by the Panel, includes the four experimental Nimbus satellite launchings already scheduled by NASA. The Panel recommended one additional Nimbus launch and the procurement of two additional Nimbus spacecraft for backup purposes.

Nimbus is an advanced earth-oriented weather satellite, to be launched from the Pacific Missile Range by the Thor-Agena B into a 600-nautical-mile, retrograde, quasi-polar orbit. The Nimbus satellite will be stabilized so that its television cameras will always point toward the earth.

Nimbus I, scheduled for launch in late 1962, will contain a vidicon camera system to provide complete coverage of the globe; a radiation subsystem including high resolution sensors for nighttime cloud cover observations and low resolution sensors for measurements of the earth-atmosphere heat balance; and devices for measuring solar radiation.

Later Nimbus satellites may carry improved sensors such as electrostatic tape cameras, spectrometers, image orthicon cameras, and radar.

During Phase I, the satellites will provide global cloud cover observations at approximately local noon and midnight: global observations of cloud top temperatures at about local midnight, permitting an estimate of cloud top heights; global heat balance measurements at local noon and midnight; and global snow and ice cover observations in cloud-free areas near local noon.

There may be some periods in Phase I when no satellite is is orbit. The availability of two backup spacecraft and launch vehicles would minimize such gaps.

At the beginning of Phase I, command and data acquisition will be limited to the station now under construction at Fairbanks, Alaska, and another station proposed for the east coast of the United States. Data observed by the satellite during daylight over portions of the Central Pacific Ocean and during the nighttime over most of Europe and Africa cannot be acquired by these stations. It is hoped that a readout station in Northwestern Europe may allow acquisition of complete global data.

Data reduction, processing, and analysis will be accomplished at the Weather Bureau's National Meteorological Center. A wide-band communications system will be required to transmit data from the acquisition stations to the National Meteorological Center. The NMC's analyses will be disseminated over domestic and international weather communication circuits.

Phase II

(January 1964 through December 1965)

In Phase II, the Panel recommends that operational Nimbus satellites should be launched at the rate of three, plus one backup, per year.

Since two operational satellites would be in orbit most of the time, the frequency of observations would be doubled. Most of the satellites would be launched so that observations would be taken at about 0300-1500 and 0900-2100 local time. Direct readout capability should be improved to provide nighttime cloud cover photographs, and improved cloud cover detail should be available over limited areas.

In Phase II, operational use would also be made of data from three experimental Aeros satellites proposed for launch during this period. The Aeros satellites would be launched from the Atlantic Missile Range, by Centaur launch vehicles, into 22,300-mile synchronous or "stationary" equatorial orbits. If Aeros satellites were in orbit, nearly continuous daylight surveillance of the weather over tropical and mid-latitude North and South America and adjacent oceans would be possible.

The Panel recommended that the Aeros research and development program should be supported, because it provides the only economically feasible means of continually viewing weather processes outside of polar regions. A decision will be made later on the role of Aeros satellites in the operational system.

During this phase, command and data acquisition stations are expected to be in operation on the east coast of the United States, at Fairbanks, Alaska, and in Europe. Communication bandwidths will be doubled to permit transmission of more frequent and more comprehensive data.

Phase III

(Beyond December 1965)

Continued launching of three Nimbus, plus one backup, per year should keep two operational satellites in orbit at all times. Operational use of data from experimental Aeros satellites would continue. Analyzed data would be disseminated nationally by improved facsimile circuits. When available, communication satellites will be used to relay data between international centers.

After their use in forecasting, satellite data will be valuable for climatological studies and for research and development work. All meteorological data obtained from the satellites will be available from the National Weather Records Center (World Data Center A) in Asheville, North Carolina.

Emergency Information To Be Available by Phone

New York City residents will soon be able to obtain recorded information on all types of emergency situations by dialing a special telephone number.

The taped information will cover facts on highways, bridges, schools, colleges, and other public facilities. During weather emergencies, the service will report on school closings, subway operations, and the condition of roads and bridges.

WNYC, New York's municipal radio station, will act as the central information-gathering agency. For this purpose, the station will be connected by direct wires to the police and fire departments, hospitals, and other agencies including the Weather Bureau. News of unusual conditions or emergencies will be transmitted to the New York Telephone Company and will be recorded on a one-minute tape.

Weather Bureau Unit Aided First Flight Of U.S. Astronaut

The Weather Bureau's Project Mercury Weather Support Group played an important role in the recent suborbital flight of Astronaut Alan B. Shepard.

During their training, the astronauts were briefed by Weather Bureau personnel on the appearance of cloud coverage from above and on what meteorological features to look for during their flights.

Weather reports and forecasts prepared by the Support Group were of major importance in planning the timing of the actual launch.

Before the scheduled launchings, maps of the entire flight area, showing the expected cloud formations, were prepared for the astronaut.

Shepard's flight was first scheduled for the morning of May 2, but was postponed primarily because of general cloudiness at Cape Canaveral and squally weather near the recovery area. Radarscope photographs from Miami, Tampa, and Daytona Beach were merged to form composite pictures, which were extremely helpful to the Mercury weathermen in following the progress of a squall line that moved across the Florida peninsula and out into the Atlantic.

The weather for the actual launching on May 5 was generally ideal except for clouds in the Cape Canaveral area which temporarily delayed the launch.

During the successful flight, Shepard reported three-eights cloud coverage from Cocoa, Florida, to Cape Hatteras. To our knowledge, this was the first pilot report from space.

Public Can Buy TIROS I Photographs From National Weather Records Center

Copies of the first seven 100-foot reels of TIROS I photographs are now available from the National Weather Records Center in Asheville. The photographs, covering the first 120 orbits of the satellite, are unrectified and ungridded, but are labeled by orbit and frame.

This is the first time that raw data from any satellite have ever been offered for sale to the public.

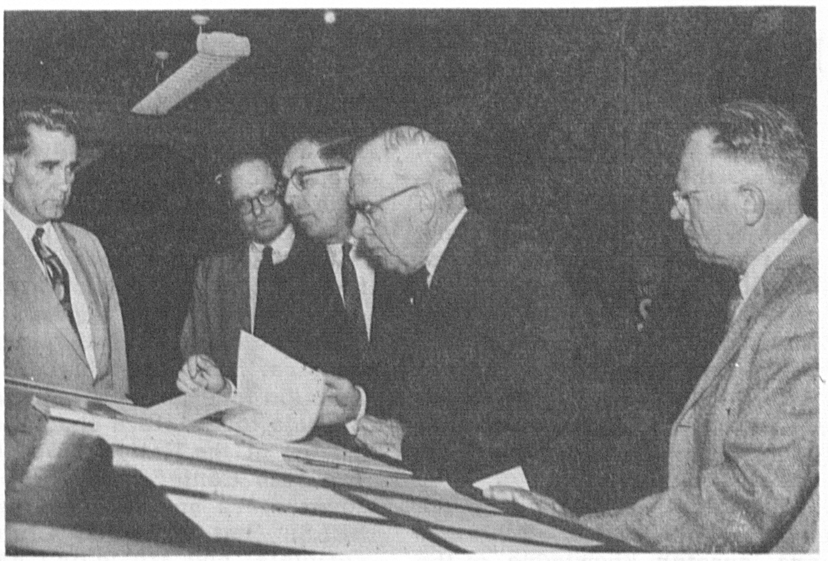
The reels may be obtained in the form of 35-mm. positive transparencies for projection or 35-mm. duplication negatives from which opaque prints can be made. Each complete reel will be sold for $4.00; individual frames or enlargements are not available.

Master negatives and positives of the pictures were prepared by the Naval Photographic Interpretation Center. Copies of these masters were then made by the NWRC for public distribution.

The first seven reels have already been sent to 23 universities in the United States and to those foreign meteorological services that took special observations in connection with TIROS II.

The complete series of TIROS I photographs will fill about 55 100-foot reels. A catalog now being prepared contains maps showing the approximate area viewed in each picture sequence and a tabulation of orbit pass-number, date, starting time of the sequence, visible landmarks, and the presence of certain cloud features. This catalog will be published as a number in the Weather Bureau series, "Key to Meteorological Records Documentation," and will be available from the Government Printing Office.

A preprint of the catalog, covering the first 109 orbits, has been completed and is available from the Meteorological Satellite Laboratory.



Secretary of Commerce Luther H. Hodges visited the National Weather Records Center on April 7. Above, the Secretary (second from right) examines material for the decennial census, with (from left) Dr. H. L. Crutcher; a press representative; H.B. Harshbarger; and S. M. Brewster.
(Photo by Ewart Ball, Staff Photographer, Asheville Citizen-Times)

Pilot-to-Forecaster Service Begins in D.C. and K.C. Areas

Beginning July 1, Weather Bureau forecasters will provide a new round-the-clock weather service to aviation. Pilots flying in the vicinity of Washington, D.C., or Kansas City, Missouri, will be able to request direct weather advisory service from Weather Bureau meteorologists. The forecasters will answer the pilots' questions and provide needed services, especially advice on hazardous or unusual weather conditions.

This pilot-to-forecaster program will be conducted as a test for one year. It is sponsored by the Federal Aviation Agency and is under the supervision of that agency's Bureau of Research and Development.

During the test, the service will be available to more than 50,000 general aviation pilots and to all air carriers and military aviation groups who wish to come in on the new frequencies. Comments from pilots will help to determine whether or not the service should be expanded into a national program.

In the Washington area, coverage will extend south to Raleigh, N. C., and west to Elkins, W. Va., with communications emanating from the Washington traffic control center. Send and receive stations will be located at Flight Service Stations in Washington, D. C., Front Royal, Va., Elkins, W.Va., Richmond, Va., Roanoke, Va., and Raleigh-Durham, N. C.

At Kansas City, the broadcasts will originate in the downtown Weather Bureau Office, and communications will be limited to the local area. Both the Washington and Kansas City frequencies will be 122.6 mc.

The effectiveness of the methods used in each test location will be compared to determine the best means of providing weather support to controllers and airborne pilots.

The Weather Bureau is encouraging pilots to report to the forecasters on weather aloft. The forecasters will keep controllers informed of existing and forecast weather for their areas.

The Weather Bureau's project leader for the test program is Clarence W. Reynolds. Tillman Gladney and Robert Baskin are Test Unit Supervisors at Washington and Kansas City respectively.

Revised CAB Regulation Permits Free Familiarization Flights

At the Weather Bureau's request, the Civil Aeronautics Board has revised its regulations to permit U.S. air carriers to provide free transportation to Weather Bureau aviation forecasters for flight familiarization purposes. The expanded flight familiarization program went into effect on June 1, after issuance of the necessary credentials and instructions.

This broadening of our familiarization flight program will give the aviation forecasters greater knowledge of the working environment and weather problems of flight crews. Also, by monitoring the ground-air communication channels, the forecasters will gain firsthand knowledge of some of the difficulties associated with the dissemination of data from ground stations to aircraft in flight.

Those eligible to take part in the flight familiarization program are the MIC, supervising forecaster, and aviation forecasters, GS-11 or higher, at aviation forecast centers; high-altitude forecasters and supervisors at the National Weather Analysis Center; severe storm forecasters and supervisors at SELS; State Aviation Liaison Officials; and MIC's or CAM's at high-activity airports.

It is hoped that every participant will make at least one flight each year. Flights will be arranged so that each forecaster can become more familiar with flight weather conditions and flight crew weather problems for his own area of forecast responsibility. For example, high-altitude forecasters would benefit most from jet flights at high altitudes over long distances, while FAWS forecasters would benefit more from shorter range flights at varying altitudes.

All qualified personnel have received Weather Bureau Form 141-4, showing their eligibility for admission to the flight deck. Flights will be arranged by the Meteorologist in Charge, and the individual forecaster will then obtain his free ticket by submitting form SF-160, "Request for Access to Aircraft or Free Transportation."

WMO Commission Holds First Session In Washington, D.C.

The First Session of the WMO Commission for Hydrological Meteorology was held in Washington, D.C., from April 12 to 25, 1961.

The meetings took place in the International Conference Suite of the new State Department Building. There were 67 participants at the session, representing 27 countries and 9 international organizations.

William E. Hiatt, Chief of Hydrologic Services Division, served as Principal United States Delegate. Also on the delegation were: R.W. Carter, Geological Survey; A.W. Johnson, Weather Bureau; M. A. Kohler, Weather Bureau; W.B. Langbein, Geological Survey; H. O. Ogrosky, Soil Conservation Service; F. F. Snyder, Corps of Engineers; W.W. Sohl, Department of State; and H. C. Storey, Forest Service.

Max A. Kohler, Chief Research Hydrologist of the Weather Bureau, was reelected President of the Commission. Mr. Kohler, who became the first President in 1960, will serve until the next meeting of the full Commission in 1965.

Professor L.J. Tison of Belgium was elected Vice President. Professor Tison is Secretary-General of the International Association of Scientific Hydrology of the International Union of Geodesy and Geophysics.

During the 14-day session, the delegates planned their future program and discussed the Commission's relationships with other international groups concerned with water resources. Among the technical matters considered were river forecasting techniques, observation networks, publication and exchange of data, and standardization of terminology, codes and units.

Back row, left to right: Wilmer L. Thompson, Region 2; Mac Emerson, Region 5; Nels E. Johnson, Pacific Supervisory Officer. Front row: Hugh D. Spangler, Region 4; Lloyd E. Brotzman, Region 1; Roy L. Fox, Region 3.

Regional Officers Meet in CO; Review Programs and Policies

The Regional Administrative Officers met in Washington from April 10 to 17 to discuss the Bureau's programs and administrative problems.

The Regional Officers were briefed on the new Meteorologist standards tentatively scheduled to go into effect in the second quarter of fiscal year 1962. Using the briefing and their background of field experience, they developed idealized patterns for stations where the MIC is presently in grade 11 and higher. They agreed that grade adjustments would be proper for Guidance Centers and for a number of stations with combined state and aviation forecast responsibilities. After the new Meteorologist standards become effective, grades for all stations will be brought into alinement as soon as practicable.

The RAO's also discussed the utilization of available meteorologists and proposed that authority for personnel actions up to and including grade GS-11 be delegated to the Regional Offices. This proposal was accepted and will take effect in the near future.

The group discussed the complaints about Service A since ADIS (Automatic Data Interchange System) went into effect and agreed that there is urgent need for improvement (see Briefs from the CO Staff Conferences).

Other matters discussed by the Regional Officers included the organization of the recently authorized Regional Engineering Division, the certification of flight service specialists, the need for urban weather stations, and the redistricting of the contiguous United States into 25 forecast areas.

Barger, Haggard Fill Top Positions at NWRC

Gerald L. Barger

Director

Dr. Gerald L. Barger has been chosen to succeed Roy L. Fox as Director of the National Weather Records Center in Asheville. Dr. Barger has been Deputy Director of the NWRC since 1958.

For the past year, Dr. Barger has been at Harvard University on a Weather Bureau scholarship, attending a Seminar on Science and Public Policy at the Graduate School of Public Administration.

Dr. Barger is a graduate of Simpson College and received his master's and doctor's degrees from Iowa State University. He also attended the University of Chicago.

Before coming to the Weather Bureau, Dr. Barger was engaged in research in the agronomy department at Iowa State. From 1942 to 1946, he served in the Air Force as a pilot and weather officer, attaining the rank of captain.

In 1948, Dr. Barger became a Meteorologist in the Weather Bureau Unit at Iowa State University. He was made Area Climatologist in 1952, remaining at Ames, Iowa, until 1958 when he moved to Asheville as Deputy Director.

Dr. Barger has published a number of articles on agriculture and climatology.

He is married to the former Margery Louise Hitzel and has four children.

Deputy Director

William H. Haggard, the new Deputy Director of the National Weather Records Center, has been a Technical Planning Analyst in the Office of Planning since 1959.

Mr. Haggard has studied at Yale University, Massachusetts Institute of Technology, the University of Chicago, North Carolina State College, George Washington University, and Florida State University, the latter under a Weather Bureau scholarship. He received his bachelor's degree from Yale and his master's degree from the University of Chicago.

During World War II, Mr. Haggard was an aerological officer in the U.S. Navy. He was called back into the Navy in 1951 and served for four years with the Bureau of Aeronautics Project AROWA.

After teaching physics at North Carolina State College, Mr. Haggard came to the Weather Bureau in 1947. He served as a meteorologist in the Scientific Services Division, an Airway Forecaster at Washington National Airport, a Training Instructor at Washington National Airport, Chief of the Marine Areas Section of the Office of Climatology, and Chief of the Climatic Advisory Service Branch, before moving to the office of Planning in 1959.

Mr. Haggard is married to the former Blanche Woolard and has two sons.

William H. Haggard

Des Moines WSR-57 Finds Lost Plane

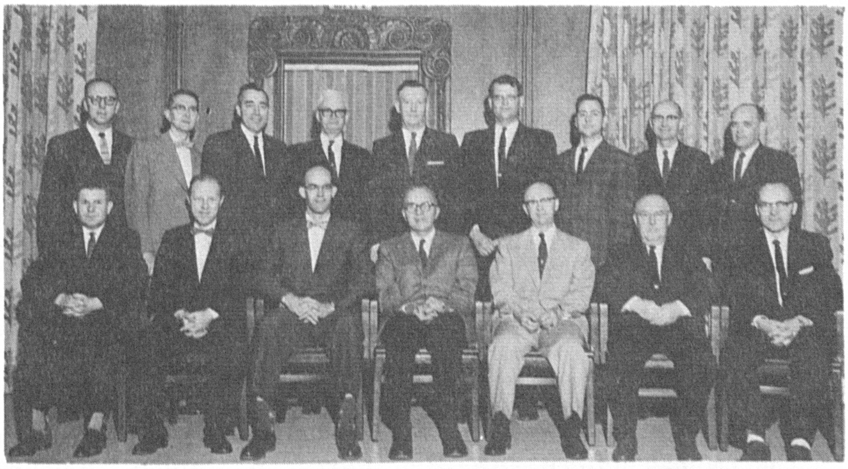
On the night of March 28, an Air Force pilot was flying a C-47 from Niagara Falls to Offutt Air Force Base near Omaha. Passing over Chicago Heights, he developed radio trouble and lost all frequencies except one.

Des Moines FAA Tower Controller Ralph Tofanelli heard the pilot call for help. He was lost, was flying at 8000 feet, and had been westbound.

Lacking other radio frequencies, the procedure for locating the lost pilot would have been time-consuming, and it occurred to Mr. Tofanelli that the Weather Bureau radar might help. He called the Des Moines Weather Bureau Airport Station and explained the situation to William B. Chapman, Radar Meteorological Technician, who was observing weather echoes east-west in the southern part of the PPI scope near the Iowa-Missouri border. Mr. Chapman was also picking up three aircraft blips in the eastern part of Iowa. One was moving northwest rapidly, another was moving to the east, and the third was nearly stationary. The stationary blip was near Ottumwa, Iowa, and was suspected to be the lost aircraft.

Radio contact verified that the pilot was circling. Mr. Chapman determined a heading which would bring an aircraft at that location to Des Moines. After the heading was relayed via the tower frequency to the pilot, the stationary blip was observed to move along the given heading toward Des Moines. As a further check, Mr. Chapman observed on the RHI scope that the aircraft blip was descending in altitude, and this was verified by the pilot.

Half an hour after his distress call, the pilot landed at Des Moines. He was most grateful for the assistance provided by Mr. Chapman and Mr. Tofanelli.



Central Area Climatologists. Top row: Joseph H. Strub, Jr. (Minn.); Marvin W. Burley (Wis.); Rheinhart W. Harms (Ill.); M. Oliver Asp (WRPC); Sanford R. Miller (N. Dak.); James D. McQuigg (Mo.); Paul J. Waite (Iowa); Gilbert E. Stegall (WRPC); Richard E. Myers (Nebr.). Bottom row: A. Boyd Pack (S. Dak.); Albert H. Eichmeier (Mich.); Robert F. Dale (AC); Lother A. Joos (O/C); Leland T. Pierce (Ohio); Andrew D. Robb (Kans.); Lawrence A. Schaal (Ind.).

State Climatologists Meet At Kansas City and Seattle

Two State Climatologist meetings were held during April. Central Area Climatologists met at Kansas City on April 13 and 14, with Area Climatologist R. F. Dale in charge. A Northwest Area meeting was held April 19 and 20 at Seattle, Washington, with Area Climatologist M.D. Magnuson in charge.

These were the first such meetings since the Climatological Field Service was reorganized in 1954.

The climatologists discussed such routine items as weekly weather and crop bulletins, severe storm reporting, information services, and liaison with WRPC and the HC Field Aides.

Non-routine activities discussed were the Weather Bureau cooperative activities with universities and agricultural experiment stations, preparation of substation summaries and of freeze bulletins, and studies of such items as evapotranspiration, soil moisture balance, phenology, evaporation, snow climatology, hay-drying in fields, and grain-drying in bins.

National Forecast Summary on Service C

A short summary of the state forecasts is now transmitted over Service C circuits each Friday and Saturday during the period 2315Z through 2319Z.

This National Forecast Summary is divided into three areas: the East Coast (east of the Appalachian Mountains); the Midwest (the area between the Appalachians and a line from the Dakotas to Texas); and the Far West (the remaining area extending to the Pacific Ocean).

The summary should be useful to the public in week-end planning. It provides an additional service for radio and television stations and the newspapers and can be used by Weather Bureau stations in evening direct radio broadcasts and on local loops.

29 Cooperative Observers Receive Bureau Awards

Twenty-nine volunteer weather observers have received the Bureau's Thomas Jefferson and John Campanius Holm Awards for 1961.

These awards were created to honor cooperative observers for outstanding achievement and were given for the first time in 1960.

The Thomas Jefferson Award for unusual and outstanding accomplishments went to Charles E. Barret, of Anchorage, Kentucky; J. Smith Lanier, of West Point, Georgia; and D. Paul Oswald, of Chewsville, Maryland. Dr. William B. Fulton, of Dadeville, Alabama, and Ralph E. Weber, of Oakland Maryland, were awarded the Thomas Jefferson Certificate posthumously.

The John Campanius Holm Award was given to 24 volunteer observers for outstanding accomplishment in the field of meteorological observations.

The Holm Award went to Mrs. Lucy C. Allen, Neuse, North Carolina; Robert E. Bradbury, Roberts, Illinois; L. Monroe Carson, Warrenton, Georgia; A.R. Cox, Redig, South Dakota; Wayne W. Creasman, Tryon, North Carolina; William C. Cromley, Brooklet, Georgia; Paul O. Feldrappe, Plymouth, Wisconsin; and Ralph H. Guy, Kenton, Oklahoma.

Others receiving the Holm Award were Rev. Plummer F. Jones, New Canton, Virginia; Harry W. Knipp, Napoleon, Ohio; Allin W. Ladd, Holyoke, Massachusetts; Clyde O. Laughner, Whitestown, Indiana; C. R. Lovell, Greenville, Kentucky; Ernest E. Martin, Salem, Missouri; Mrs. H. F. McCall, Ulysses, Kansas; and J.C. Overpeck, State University, New Mexico.

Holm certificates were also given to Mrs. Bessie Powe Page, Cheraw, South Carolina; Edwin L. Paulson, St. Helena, California; Charles M. Richardson, Willoughby, Ohio; Joseph C. Robinson, Laketown, Utah; C. O. Romig, Dennison, Ohio; Frank J. Southmayd, Franklin, New Hampshire; R.L. Staats, Chugwater, Wyoming; and W.C. Wiggins, Flatwillow, Montana (posthumous).

WMO Working Groups Discuss Communications At Paris Conferences

A Special Working Group on the Exchange of Basic Meteorological Information between Regions IV (North America) and VI (Europe) met in Paris during April to determine the adequacy of communications to meet present and future requirements of North Atlantic air navigation. The group has requested the International Civil Aviation Organization (ICAO) to allocate an exclusive meteorological channel on the proposed ICAO North Atlantic cable circuit. It was agreed that such a channel, together with the planned improvements in the existing radioteletypewriter circuits, would meet the requirements adequately.

The Telecommunications Working Group of the WMO Commission for Synoptic Meterology held its Second Session from April 11 to April 27. A number of important actions were taken by this group. It recommended the establishment of a Southern Hemisphere Exchange Network, similar to the one now operating in the Northern Hemisphere, and proposed that data from present and future United States weather satellites should be disseminated internationally.

S.R. Barbagallo, of the Forecasts and Synoptic Reports Division, represented the United States and Region IV at both of these meetings.

New MIC Chosen for New York WBO

Charles G. Knudson has been selected to succeed Ernest J. Christie as Meteorologist in Charge of the New York Weather Bureau Office. Mr. Knudson has been Principal Assistant at New York since 1956.

After graduating from St. John's University in Brooklyn, Mr. Knudson remained at the University as an instructor. He received a master's degree from Columbia University in 1939 and has done further graduate study at New York University.

Entering the Bureau in 1942, Mr. Knudson was assigned first to the Analysis Center and then to the Washington National Airport. From 1943 to 1945 he served in the U.S. Navy. After the war, he returned to the Bureau as Chief Airport Meteorologist at New York International Airport.

In 1953, Mr. Knudson was recalled to active duty in the Navy and served at the U.S. Naval Postgraduate School in Monterey, California, for two years. Returning to civilian life in 1955, he was assigned briefly to the Central Office and then spent a year as Meteorologist in Charge of the Air Navigation Development Board's visibility project at Newark Airport, before going to the New York Weather Bureau Office as Principal Assistant.

Mr. Knudson is married and has three children: Beth Ann, 17; Charles G., 12; John B., 9. He lives at 49 Highlander Drive, Scotch Plains, New York.

Scientists See Need For Further Study Of Ocean Waves

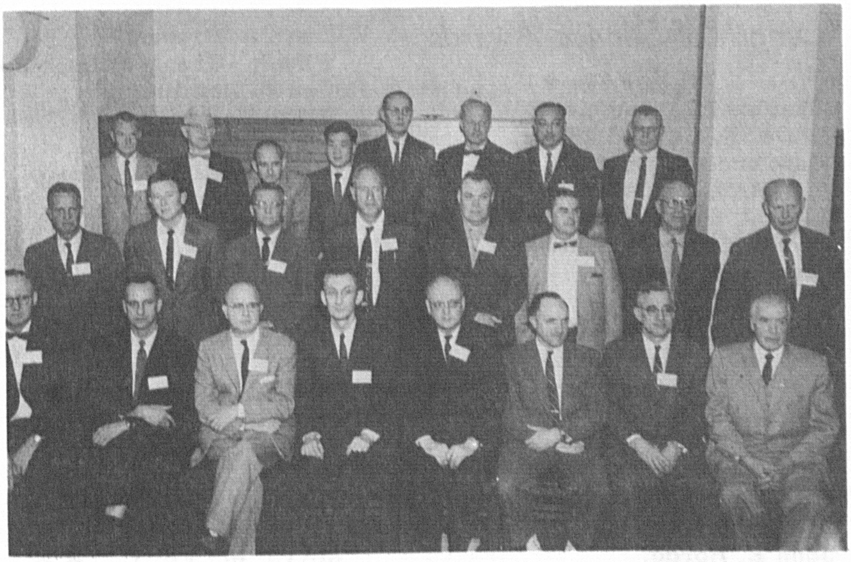
A Conference on Ocean Wave Spectra was held at Easton, Maryland, in early May. The conference was arranged by the National Academy of Sciences under the sponsorship of the U.S. Navy Hydrographic Office. More than 70 oceanographers, geophysicists, meteorologists, and others working in related sciences, representing nine countries, attended the sessions. Weather Bureau representatives were D. Lee Harris, of the Office of Meteorological Research; W.W. Shinners, of the Observations and Station Facilities Division; and A.E. Sik, of the Forecasts and Synoptic Reports Division.

The conference established a rather large area of general agreement in theoretical oceanographic research. The consensus was that further research on the behavior of ocean waves is needed to improve the accuracy of sea and swell wave forecasts. Establishment of wave synoptic networks and improvements in the accuracy of wind observations were considered essential to further oceanographic research.

Bureau Receives Award For Safety Promotion

The Weather Bureau has received an Award of Merit from the Secretary of Commerce for its work in safety promotion. The Bureau was praised for holding its personal injury rate near a minimum and for reducing its motor vehicle accident rate by 23 percent.

As a result of its overall safety accomplishments, the Department of Commerce has received honorable mention in the President's 1960 safety award competition. The Department's motor vehicle accident rate has declined 23 percent in the past two years, putting it 17 percent below the all-government average.



Western Area Field Aides Meet in San Francisco

A seminar for Area Substation Field Aides from the western third of the United States was held in San Francisco during the week of February 27. In addition to the Field Aides, representatives of Climatic, Hydrologic, District, Regional, and Central Offices, and of the California Department of Water Resources attended the seminar.

Similar seminars were held in Kansas City and Chattanooga in 1959.

In the photograph above, taken at the San Francisco meeting, are: (first row, left to right) A.K. Showalter, H. L. Lewis, H. E. Torbitt, G. Wertz, G.M. Krahl, C.R. Jordan, J. van de Erve, S.D. Green; (second row) D. T. Van Osdol, S. O. Howick, W. Irgens, Z. Borem, H.A. Kappes, H. J. Gudyka, W. O. Siedentopf, and M. Bergerson.

Stallard Is New MIC at Philadelphia

Glenn Stallard is the new Meteorologist in Charge at the Philadelphia Weather Bureau Airport Station. Mr. Stallard moved to Philadelphia from the Airport Station in St. Louis, where he was Principal Aviation Forecaster.

A graduate of King's College, in Bristol, Tennessee, Mr. Stallard has also attended East Tennessee Teachers College and the University of Tennessee. He received his master's degree from New York University, where he studied under a Weather Bureau scholarship.

After teaching high school in Tennessee, Mr. Stallard entered the Weather Bureau as an Observer at Knoxville. He later served in Detroit; Miami; Keflavik, Iceland, as OIC; and San Juan, where he was Meteorologist in Charge of the Weather Bureau Airport Station for six years before moving to St. Louis.

Length of Service Awards

40-Year Awards

Charles L. Dannheiser,
O&SF, Central Office
Lawrence N. Despain,
WBAS, Los Angeles
Leon J. Guthrie,
WBAS, Roswell, N. Mex.
Sidney W. Overton
NWRC, Asheville

35-Year Awards

Edward C. Corkill,
WBFC, Kansas City
Harold Thomas
RAO, New York

30-Year Awards

Clarence A. Anderson,
WBAS, Waco
John E. Horde,
WBFC, Chicago
Ernest C. Johnson,
WBO, Albany, N. Y.
Mary R. McDaniel,
WBO, Sacramento
Lucius P. Spicer,
WBAS, Rome, Ga.

25-Year Awards

Joseph S. Barry
Climat Central Office
Donald A. Compton,
WBAS, New Orleans
William J. Cusick,
WBAS, Boston
William A. Grimes,
WBAS, Great Falls, Mont.
James E. Hainlin,
WBAS,Tampa
Herbert F. Huennekens,
WBAS, Billings, Mont.
Doris L. Lanctot,
WBAS, Minneapolis
Sanford R. Miller,
WBAS, Bismarck
Victor M. Sproge,
WBAS, San Francisco
Gilbert L. St. Clair,
WBAS, Washington, D.C.
Chester M. Veliquette,
WBAS, Sacramento

15-Year Awards

Fred G. Bear, Jr.,
WBAS, Washington, D.C.
George Bliss, Jr.,
WBAS, Miami
Doyle S. Casey,
WBAS, Brownsville
James F. Cizek,
WBAS, Portland, Me.
Wayne E. Coffman,
WBAS, Billings, Mont.
Salvatore N. DeSena,
WBAS, New York
Robert D. Evans,
RAO, Salt Lake City
Margaret L. French,
NMC, Central Office
John R. Garton,
WBAS, Norfolk
Irene Grigsby,
RAO, Kansas City
Norman H. Harper,
WBAS, Mansfield, O.
Howard J. Haviland,
RAO, New York
Walter E. Highberg,
WBAS, Spokane
Romeo M. Hinton,
Adm. Ops., Central Office
Jewell B. Holleyman,
WBFC, Chicago
Christopher E. Horseman,
AWP, Boston
Michael S. Hvizdak,
WBAS, El Paso
Joseph H. Jackson,
Adm. Ops., Central Office
William T. Keating,
WBAS, Jackson, Miss.
Arthur J. Krueger,
OMR, Central Office
Turner J. Lloyd,
Adm. Ops., Central Office.
Jack B. Lyman,
WBAS, New Orleans
Edward J. Mallumian,
WBAS, New York
Oscar J. Meece,
WBAS, Bristol, Tenn.
George D. Mueller,
WBAS, Great Falls, Mont.
Gerald P. O'Donnell
WBO, Burrwood, La.
Donald L. Olson,
PWP, San Francisco
Bessie M. Paul,
WBAS, Billings, Mont.
Alan M. Sanderson,
NMC, Central Office
Donald T. Shankle,
WBAS, Salem, Ore.
Walter Joseph Stoddard,
WBO, New York
Raymond G. Strietzel,
WBAS, Denver
Robert T. Thorton,
WBAS, Fort Worth
William L. Turner,
WBAS, Worcester
Carl V. Tyozandlak,
NMC, Central Office
Dorothy B. Walker,
Adm. Ops., Central Office
Henry E. Wise,
WBAS, Boston
Isaiah Zamarripa,
DMO, Kansas City
Seymour B. Zuckerman,
WBAS, Tucson

Suggestion Award Winners

Glenn F. O'Kelley, Jr.	NWRC, Asheville, N.C.	$50
George M. Krahl	O&SF Division, CO	25
Joseph H. Hagarty	Office of Climat., CO	20
Wilma Amante	General Services Section, CO	15
Joseph W. Bailey	NWRC, Asheville, N.C.	15
Mary M. Gearhart	Office of Int'l. Met. Plans, CO	15
William M. McMurray	NWRC, Asheville, N.C.	15
Lawrence O. Oliver	WBAS, Great Falls, Montana	15
Fern B. Reid	RAO, Salt Lake City, Utah	15
Alma H. Worth	WBAS, Cincinnati, Ohio	15
William R. Wright	WBAS, Augusta, Georgia	15
Dwight Baertsch	WBAS, Glasgow, Montana	10
Kenneth R. Hein	WRPC, Chattanooga, Tenn.	10
Rex J. Hess	WBAS, Missoula, Montana	10
Oliver J. House	WBAS, Columbia, Mo.	10
Melvin A. Johnson	NAWAC, CO	10
Milton G. Johnson	NWRC, Asheville	10
William Klein	WBAS, Santa Maria, Calif.	10
Robert E. Lautzenheiser	WBO, Boston, Mass.	10
Sanford D. Miller	WBAS, Bismarck, N.D.	10
William Thomas, Jr.	NAWAC, CO	10
Group Award:		
William B. Chapman James M. Yates	WBAS, Des Moines, Iowa	20

RETIREMENTS

Howard J. Thompson

Howard J. Thompson, Meteorologist in Charge of the Weather Bureau Airport Station at Milwaukee, retired on April 4. At the time of his retirement, Mr. Thompson was the Bureau's oldest employee in terms of length of service. He entered the Bureau in 1912 as a Minor Observer at Sault Ste. Marie. Later moves took him to Trenton, New Orleans, Savannah, and Alaska, where he spent 21 years. From 1943 until his retirement, Mr. Thompson headed the Weather Bureau office in Milwaukee. He served in the Army during World War I and attended the U. S. Army Meteorological School at Texas A & M. Mr. and Mrs. Thompson live at the Knickerbocker Hotel, Apartment #623, 1028 East Juneau Avenue, Milwaukee 2, Wisconsin.

Joseph P. Kohler

Joseph P. Kohler, a Meteorologist in the Office of Climatology, retired on April 7 after 33 years of Weather Bureau service. Mr. Kohler began his Bureau career as an Observer in Escanaba, Michigan. He also served at Sault Ste. Marie before transferring to the Central Office in 1931. Mr. Kohler attended St. Mary's College and George Washington University. His home address is 7849 Indian Queen Point Road, S. E., Oxon Hill, Maryland.

Margarette Richardson

Miss Margarette Richardson, a Clerk-Stenographer with the Pacific Weather Patrol in San Francisco, retired on May 31 after 25 years of government service. Miss Richardson came to the Weather Bureau in 1938 and, with the exception of two years in Los Angeles, all of her Bureau service was in San Francisco. She had previously worked for several other government agencies, in private industry, and for the American Red Cross. Miss Richardson lives at 816 Lisbon Street, San Francisco 12, California.

Leonard J. C. Hedine

Leonard J. C. Hedine, a Meteorological Technician at the Weather Bureau Office in Roseburg, Oregon, retired on May 29. Mr. Hedine began his Bureau career in 1928 as a Junior Observer at Havre, Montana. He later served at Nome; Winslow, Ariz.; Winnemucca, Nev.; Los Angeles; Bakersfield, and San Francisco.

Raymond H. Janson

Raymond H. Janson, a Meteorological Technician at the Seattle - Tacoma Weather Bureau Airport Station, retired on June 3. Mr. Janson is a graduate of the University of Washington. In 1930, he entered the Weather Bureau as a Junior Observer at Seattle and was later assigned to Fargo, N. Dak.; El Paso, Tex.; Ketchikan, Alaska; North Head, Washington; and Astoria, Oregon. Mr. Janson's address is 4860 East Mercer Way, Mercer Island, Washington.

Awards for Superior Performance

Superior Performance Awards were recently approved for 25 employees. These awards were granted primarily for maintaining exceedingly high standards of performance on the job or accomplishing special assignments in an outstanding manner.

Employees who have been cited for their excellent work are:

Lester A. Snyder	Proc. & Supply Asst.	RAO, Ft. Worth
J. Loring Laughter	Met.	WBO, Asheville
Thomas E. Wahl	Met. Tech.	WBAS, Scranton
Margaret A. Rutherford	Appointment Clerk	RAO, Kansas City
Dick M. Whiting	Tab. Proj. Planner	NWRC, Asheville
Ernest P. Hunt	Met. Tech.	WBAS, Los Angeles
Eugene G. Harding	Met.	WBAS, Flagstaff
William D. Bartlett	Archives Asst.	NWRC, Asheville
Alfred B. Nelson	Met.	WBAS, Red Bluff
Edith F. Rhash	Clerk-Typist	NWRC, Asheville
Harry Terban	Met. Tech.	WBAS, Boston
Katrina U. Lawson	Clerk-Typist	WRPC, Chattanooga
James R. Taylor	Electronic Tech.	WBAS, Muskegon
Hugh B. Carwile	Supply & Trans. Clerk	RAO, Ft. Worth
Roy J. Holub	Supply Clerk	RAO, Ft. Worth
Akimichi Kimura	Met. Tech.	WBAS, Honolulu
Minoru Murakami	Met. Tech.	WBAS, Honolulu
Keith E. Lingenfelter	Met.	WBAS, Red Bluff
Nick Bardoulas	Met. Tech.	WBAS, Rockford
Eileen E. Owen	Met. Tech.	WBAS, Anchorage
Alan Harris	Tab. Project Planner	NWRC, Asheville
Mary E. Earley	Met. Tech.	WBAS, Boston
Robert E. Blackstone	Met. Tech.	WBAS, Los Angeles
Lyle B. Rasey	Met.	WBAS, San Francisco
Frank W. Reanier	Met.	WBAS, Fresno

Man-in-the-Job Concept

The Civil Service Commission has recently reemphasized the need for careful examination of all the ways a job can be altered. The Commission pointed out that "the proper administration of position classification requires that positions be currently classified on the basis of their current contents and that management-recognized changes in position content be evaluated promptly and properly, regardless of the cause of such changes."

For the most part, position changes originated by management--because of changes in policy, organization, law, technology, or program requirements--are readily identified and recognized by proper classification. However, there has sometimes been inadequate recognition in the classification process of the very real relationship between the employee himself and his job. A top-notch employee can materially change the nature of his job.

An employee's academic background and experience can have an important bearing on the kind or title of his job. Where appropriate, the Weather Bureau has used Meteorological Technicians to free fully-trained Meteorologists for work requiring more professional skill.

In the Bureau's hydrologic program, many research positions can be filled by an employee with training in either meteorology or hydraulic engineering. Here, the abilities and qualifications of the employee will, in effect, determine the kind and title of his job.

The impact of the man on the grade of his job is of greater importance to most employees. The total duties, responsibilities, and qualifications of an employee determine how much he is paid. The scope of the assignment can be checked with an appropriate position classification standard to determine the proper grade level. Full weight should be given to the amount of change in total value of the job made by the employee himself. The grade of a position may go up or down, depending on the ability applied by the employee to the total job.

Even though an employee selected for a job may meet the entrance requirements for his line of work, his background may actually upgrade or downgrade his position. Downgrading could occur when unusual weakness in the ability of the employee makes it necessary for a supervisor to review his work more closely or to provide easier work assignments. On the other hand, an employee who demonstrates exceptional ability in applying his knowledge may need less supervision and may be assigned more difficult projects requiring greater originality.

Some jobs are so controlled by regulations and procedures that their grade levels are not likely to change, even though an incumbent's abilities are outstanding. The employee may do more refined work than necessary or turn out more pieces than are called for by the organization's work standards. Such ability should be recognized through individual incentive awards or by promotion to a higher grade, different job, even though this job may be in the same line of work.

The impact of the man on the job should be reflected in the classification of his position only when his skills and abilities affect the job enough to make it materially different from what it otherwise would have been.

(This subject will be covered in a forthcoming Circular Letter, which will include guidelines for evaluating man-in-the-job considerations.)

President Creates Committee to Ensure Equal Employment

Every Government Department and agency has been directed by Executive Order to make a comprehensive study of current employment practices within its jurisdiction. In issuing the Order, President Kennedy pointed out that all qualified persons should be considered for employment by the Federal Government and on Government contracts without regard to race, color, or national origin.

The President's Committee on Equal Employment has been established to supervise government employment and goverment contracts. The members of the Committee include the Vice President (chairman), the Secretary of Labor (assistant chairman), and three Cabinet members, including Secretary of Commerce Hodges.

Efforts to increase the rate of progress within the Department of Commerce were pledged by Secretary Hodges. "I am satisfied that the record of the Commerce Department compares favorably with any other agency of the Federal Government. But even this record is just not good enough. I am hopeful that in the period ahead we can step up the progress we have been making."

Secretary Hodges emphasized that the attitudes and actions of the Department's rank-and-file employees are important to the success of the program. Every new worker should be made to feel welcome, helped in learning his job, and encouraged to work for promotion.

"Let no man or woman in this Department ever feel that his talents and his qualifications will be measured by the color of his skin or the faith he practices," Secretary Hodges said.

Meteorological Readings

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate. For more introductory information, see TOPICS May 1957.

Assignment XLVIII: A Graphical Method for Computing Horizontal Trajectories in the Atmosphere, by H.V. Goodyear, Monthly Weather Review, May 1959, pp. 188-195.

About the Assignment: The article develops graphical solutions of the horizontal equations of motion for computation of dynamic trajectories and discusses techniques for using these solutions in quantitative precipitation forecasts.

QUESTIONNAIRE

Col. 61 The mean geostrophic wind acting on the air particle whose trajectory is to be calculated is obtained:

1. from the gradient wind at the "gradient" level
2. by averaging the ageostrophic wind along the path of the particle
3. by assuming the initial wind velocity is a certain ratio of the geostrophic wind
4. by averaging the geostrophic wind at different points along the assumed path of the trajectory, and re-evaluating if computed path is radically different

Col. 62 Mark the true statements:

1. the simplified equations of motion, without friction, can be solved graphically only if the geostrophic wind is constant (or changes linearly) along the trajectory
2. the angle of strike is dependent on the magnitude of the ageostrophic wind
3. the ageostrophic wind is what is added to the geostrophic wind to give the actual wind
4. the geostrophic wind may be considered merely another way to express the pressure gradient force with an added curvature term

Col. 63 In this particular experiment it was assumed that the frictional forces are against the wind in direction:

1. and proportional to the first power of the speed
2. and directly proportional to the speed squared
3. and inversely proportional to the square of the speed
4. and constant in magnitude

Col. 64 the overlay shown on figure 6:

1. is designed to help construct frictionless trajectories by steps of 1-1/2 or 3 hours
2. can be used at other latitudes by merely changing the scale along the left hand edge
3. is designed to help solve the complete equations of motion
4. solves the equations of motion only for the middle latitudes

Col. 65 This system of computing frictionless trajectories:

1. is good even at the equator, because f = 0
2. gives better results, in general, the longer the time interval used
3. should give fairly good results in the middle and upper troposphere
4. gives good results even if the initial wind or wind field is not known

Col. 66 The simplest hypothesis that can be made regarding frictional forces acting on an air particle near the surface is that:

1. they act so as to make surface winds cut across isobars toward lower pressure
2. they are always constant
3. they are directed against the wind in direction and proportional to some simple power of the speed
4. they are directed partially against the wind in direction and partially normal to it

Col. 67 Theoretically, because of frictional accelerations, surface winds:

1. subjected to the same changing pressure field approach similar values regardless of the initial values
2. all approach the same values only if the initial values are the same
3. always change more rapidly with time over rough terrain than over water areas
4. do none of the above

Col. 68 The fundamental principle involved in computing changes in the wind velocity is that, assuming the geostrophic wind to be constant,

1. the wind velocity changes linearly with time
2. the ageostrophic wind is constant in magnitude, but rotates anticyclonically with an angular speed equal to the Coriolis parameter
3. the ageostrophic wind velocity is always constant
4. friction or viscosity has no effect on the wind velocity

Col. 69 The only difference, basically, between the nomograph of fig. 4 and the overlay of fig. 6 is that the former:

1. includes frictional adjustments
2. solves the equations of motion analytically
3. has a built-in technique for getting the average between the initial and final winds
4. utilizes geometry principles

Col. 70 A wind (or moving air particles) is considered in balance:

1. when it is moving parallel to the isobars
2. when the total of all forces acting on it equal zero
3. when the centrifugal force equals zero
4. when the frictional forces equal the pressure gradient force

Welcome to the Weather Bureau

NEW EMPLOYEES

David H. Abrams, Budget Analyst, New York, N.Y.
Peter D. Ainsworth, Illustrator, Central Office
Emily K. Aki, Teletypist, Honolulu
Morris L. Bain, Personnel Management Specialist, Kansas City
Ernest E. Block, Meteorological Technician, Barrow, Alaska
Darwin D. Braden, Meteorological Technician, Cordova, Alaska
Wallace Brewer, Meteorological Technician, Central Office
John A. Brown, Jr., Meteorologist, Central Office
Kenneth E. Bryan, Meteorologist, St. Louis
Kirk Bryan, Meteorologist, Central Office
Roy W. Carroll, Meteorological Technician, Anchorage
Ernest Edward Champion, Electronic Development Technician, Central Office
Charley Chapa, Electronic Maintenance Technician, Albuquerque
Stanley G. Ciesla, Meteorologist, Chicago
Arthur O. Clark, Electronic Maintenance Technician, New Orleans
Mary Margaret Beattie Clark, Time, Leave, and Payroll Clerk, Central Office
Stanley G. Corp, Meteorological Technician, Winnemucca, Nevada
Mary S. Cotten, Purchasing Agent, Fort Worth
Belle C. Dixon, Secretary, Central Office
Erma Van Dyke Dixon, Secretary, Central Office
Melvin Dunefsky, Meteorologist, Cleveland
Henry G. Favrot, Hydraulic Engineer, Central Office
James C. Fischer, Electronic Development Technician, Central Office
John Vincent Foreman, Voucher Examiner, Central Office
William C. Forgie, Electronic Maintenance Technician, Omaha
Paul A. Gareau, Meteorological Technician, Knoxville, Tenn.
Harold Paul Gerrish, Meteorologist, Miami
Richard A. Gonce, Meteorological Technician, Anchorage
Walter R. Graham, Jr., Meteorological Technician, Glasgow, Mont.
Lloyd W. Graybill, Meteorologist, Sacramento
Patsy Ann Grim, Clerk-Stenographer, Chicago
Carl Gullach, Meteorological Technician, North Platte
Charles G. Haas, Meteorological Technician, Flint, Michigan
Ronald E. Haug, Meteorologist, St. Louis
David C. Hughes, Electronic Maintenance Technician, Amarillo
Douglas J. Johnson, Meteorological Technician, Tatoosh Island
Way Edmond Justice, Supervisory File Clerk, Asheville
Stanley K. Kaneshiro, Fiscal Officer, Honolulu
Richard W. Kelly , Electronic Maintenance Technician, Wallops Island
Dwight Kennard, Meteorologist, Kansas City
Richard A. Knubbe, Fiscal Supervisor, Salt Lake City
Raleigh Eugene Lackey, Meteorological Technician, Rapid City, S. Dak.
Irby R. LaPorte, Electronic Maintenance Technician, Washington, D.C.
Hazel M. Lawrence, Procurement Clerk, Central Office
Beatrice D. MacDonald, Voucher Examiner, Anchorage
Huron A. Marmon, Jr., Meteorological Technician, Brownsville
Myrtle Marie Martin, Card Punch Operator, Miami
Mary Ellen McQuiddy, Accounting & Fiscal Clerk, Central Office
Coy A. Mewborn, Clerk-Typist, Anchorage
Ruth Teresa Mirring, Secretary, Central Office
Wilfrid J. Montagne, Meteorological Technician, New Orleans
Herbert Neiss, Meteorologist, New York
Chester W. Newton, Supervisory Meteorologist, Kansas City
Bluford R. Nickell, Construction & Maintenance Representative Kansas City
Louis Novotny, Meteorological Technician, Central Office
Van Franklin Nowak, Meteorological Technician, Kansas City
Terrance Robert Palmer, Meteorologist, Las Vegas
John K. Popham, Jr., Contract Specialist, Central Office
Arthur E. Prosser, Jr., Meteorologist, Cleveland
Thelma K. Reddick, Clerk-Typist, Central Office
Nicholas E. Rizzo, Personnel Management Specialist, New York
Donald A. Russell, Meteorological Technician, San Francisco
James D. Russell, Meteorological Technician, Honolulu
George Rutkoski, Accounting & Fiscal Clerk, Central Office
Robert C. Schneider, Meteorological Technician, Central Office
James E. Sheppard, Meteorological Technician, San Francisco
Alan Ray Simmons, Meteorologist, Central Office
Lola Singletary, Library Assistant, Central Office
Robert W. Smallfield, Meteorological Technician, Ely, Nevada
Espriela Sarreals Jr., Meteorologist, New York
William Reid Sorrells, Archives Assistant, Asheville
Doris L. G. Steward, Clerk-Typist, Central Office
Alice J. Svorcek, Clerk-Stenographer, Missoula
John Taboniar, Meteorological Technician, Canton, Island
Albert D. Teekel, Meteorological Technician, New Orleans
Robert Allen Thompson , Electronic Maintenance Technician, Columbia, Mo.
Eugene Ward Tolle, Teletypist, Kansas City
Andrew A. Vartanian, Photographer, Central Office
Andrew F. Vito, Construction and Maintenance Representative New York
William Ward, Jr., Custodial Laborer, Washington, D.C.
Robert N. Welch, Electronic Accounting Machine Operator, San Francisco
Lascellis W. Yates, Jr., Meteorologist, Portland
Barbara M. Zoshak, Clerk, Anchorage

Transfers

TRANSFERS	From	To
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Stanley M. Bakich	Miami	Sioux City
Martin M. Baumann	St. Cloud, Minn.	Bismarck
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Francis C. Bidwell	Cold Bay	Cordova, Alaska
Ottis C. Bobbitt	Salt Lake City	Dodge City
James E. Boudreaux	Lihue, Kauai	Canton Island
Darwin S. Braden	Cordova	Cold Bay, Alaska
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David Lee Yingling	Antarctica	San Francisco
Byron A. Young	Kansas City	Salt Lake City
Jarvis J. Younger, Jr.	Key West	Brownsville

A Problem and a Need in the Use of Radar Reports

by George C. Williams and Lawrence A. Hughes, WBFC, Chicago

On December 4, 1960, there was an unusually warm thermal ridge in the lower troposphere extending from Texas to Iowa and Illinois. Maintaining this feature was a developing low pressure area to the west over the Southern Rockies and an unchanging high over the Southeastern States. Numerous RAOBS indicated that the ridge contained marked subsidence between about 7000 and 15,000 feet, with a pronounced inversion of about 7°C. and near "motorboating" conditions at the base of the subsidence layer. Below the very dry subsidence layer was a rather solid layer of stratocumulus about 3000 feet thick at a temperature several degrees above freezing, while above the subsidence layer was thickening altostratus.

Shortly after midnight on the fourth, radar echoes began forming in the thermal ridge, and soon they expanded into essentially one rather large area covering parts of Missouri, Iowa, and Illinois. The radar reports indicated the tops of the echoes to be 15-20,000 feet but they gave no indication of the base of the echoes. It seemed evident from the soundings, from the thickness and temperature of the stratocumulus layer, and from the fact that precipitation was not immediately reported at the ground, that the echoes were from precipitation developing entirely within the altostratus layer and evaporating upon falling into the very dry air just below. In spite of the large area covered by the echoes and the fact that they persisted for a number of hours, none of the teletypewriter reporting stations in the general area reported precipitation until several hours after the first appearance of the echoes. Even then, no measurable amounts were reported, and only a couple of stations reported "trace" amounts.

The problem facing the forecaster at the time--once he had determined that the echoes were not spurious but were due to the presence of precipitation aloft--was: "Will the evaporating precipitation sufficiently raise the humidity of the very dry subsidence layer so the precipitation will reach the ground and, if so, when will it reach the ground?" Knowledge of the base of the radar echoes would have been considerable help in solving this problem. Since there are no doubt other situations in forecasting for both public and aviation needs where knowledge of the base of the echo would be helpful, we would like to recommend that the height of the echo base be reported whenever it can be obtained.

DEATHS

Wynona W. Welch

Mrs. Wynona W. Welch, an Aviation Observer at Salmon, Idaho, died December 17, 1960. Mrs. Welch and her husband, Golden, have served as Observers at Salmon since December 1943.

Norman R. Hastings

Norman R. Hastings, a former Principal Assistant and Climatologist at the Weather Bureau Office in Huron, South Dakota, died on March 28, 1961. Mr. Hastings entered the Weather Bureau in 1930 as a Junior Observer in Del Rio and later served at Wichita, Pensacola, New Haven, Hartford, Washington, D.C., and Kansas City. He was assigned to Huron in 1947 and remained there until his retirement in 1957.

John W. Blasangame

John W. Blasangame, an Accounting and Fiscal Clerk in the Central Office, died on April 28, at the age of 32. Mr. Blasangame attended the Strayer Junior College of Finance. He had worked for the Post Office and in private industry before coming to the Weather Bureau in January of 1960. He is survived by his wife, Irene, of 1900 Columbia Pike, Arlington, Virginia.

Karl L. Chambers

Karl L. Chambers, a Meteorological Technician at the Las Vegas Weather Bureau Research Station, died on April 18, 1961. Mr. Chambers had been with the Bureau since 1953, serving first at Alpena, Michigan, and later at the Central Office and Midland and Amarillo, Texas. He is survived by his wife and two daughters, who live at 2729 Hickey Avenue, North Las Vegas, Nevada.

CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

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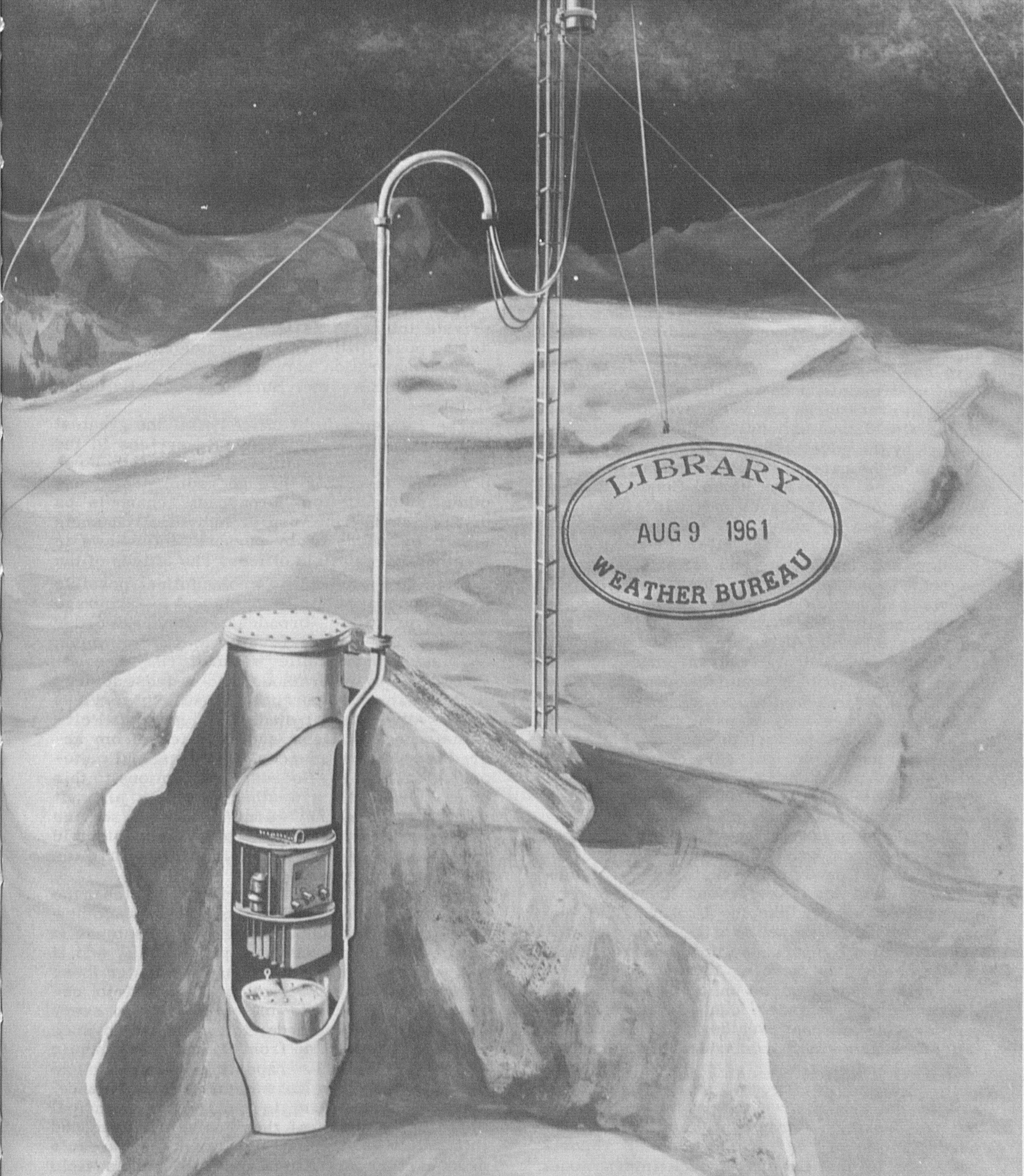


ATOMIC-POWERED WEATHER STATION

Editorial

The Weather Bureau and the Private Meteorologist

(Excerpt from the Presidential Address by F. W. Reichelderfer before the American Meteorological Society, December 1940.)

As long as man's health, means of livelihood, and general welfare are determined in large measure by weather and climate, it is natural that almost everybody will continue to be a user or prospective user of meteorological information in one way or another. The value of weather reports, forecasts, and storm warnings as a service contributing to the public welfare has long been recognized in the establishment and maintenance of official weather bureaus in every large and well-developed country in the world. The national weather bureau supported by the government in each country gives the public the current weather reports and forecasts, keeps watch for storm, flood, and cold wave developments, issues warnings to the public when necessary, and keeps weather records which are the basis for climatological summaries and tabulations and for scientific research. These bureaus provide meteorological services of benefit to the general public and to the principal fields of business and industry--agriculture, aviation, commerce, engineering, rail, highway, and water transportation, and civic or quasi-public organizations such as the Red Cross.

But these are only a part and probably a relatively small part of the potential uses of modern meteorological services. Many industrial corporations and private individuals would profit by specialized or individualized services analogous to the professional services of the company lawyer, physician, or engineer. These services meet the particular needs of the individual, and private meteorological services of this kind are beyond the scope of a government agency like the U. S. Weather Bureau. They are the function of the company meteorologist or a firm of consulting meteorologists.

Meteorology is more or less unique in that the private meteorologist unlike the lawyer, the doctor, or the engineer, cannot run his office and provide current weather information and daily forecasts wholly independent of government facilities and services. The private meteorologist, in order to forecast the weather, must utilize the synoptic weather reports collected by the Weather Bureau; in fact, he usually needs some of the foreign weather reports collected in the Bureau through international exchange by radio and cable. Thus it is to the interest of the private meteorologist to have the helpful cooperation of the Bureau. At the same time, the Bureau can benefit through cooperation by the private meteorologist if he relieves the Bureau of individual inquiries for services beyond the scope of the Bureau's work. The private meteorologist can also help in other ways to broaden the applications of meteorology and to cultivate a better understanding among private interests as to the limitations as well as the possibilities of meteorological services. Close cooperation between private meteorologists and the Weather Bureau is mutually beneficial.

The Bureau's field offices offer the greatest good in public meteorological services to the greatest number by disseminating weather reports and forecasts through radio, press, and other automatic or "broadcast" channels as distinguished from use of individual channels either by phone or by personal interviews in Weather Bureau field offices. The offices of the Bureau are advised to make fullest possible use of general public channels and to encourage callers to utilize broadcast channels in order to keep the personal calls to the minimum consistent with public welfare. They are advised also to refer those who request advices in the nature of personal consulting services that involve special studies and individual circumstances, to seek such services from accredited private sources of professional meteorological advice. Necessary exceptions to this practice are flying weather advices to aircraft pilots and emergency warnings to public service facilities like the street railway and electric power companies where public welfare and often safety are concerned.

Further development of private practice in the field of meteorology should open the way to new applications and technical improvements as it has in other sciences and professions, and it is the aim of the Weather Bureau to foster these improvements and developments and to cooperate with private meteorologists in every appropriate way in order to extend and advance the benefits available from the national synoptic network of weather reporting stations and to promote progress in meteorological science. Pursuit of this aim is one of the principal operating policies of the Weather Bureau, and this policy is carried out through the Bureau's headquarters activities and through its field offices throughout the country.

Topigrams

Washington, D.C.
July, 1961

At 6:26 a.m. on July 12, the nation's third meteorological satellite, TIROS III, was successfully launched from Cape Canaveral by the National Aeronautics and Space Administration. The 287-pound satellite went into a nearly circular 450-mile-high orbit. TIROS III carries two wide-angle cameras and three radiation experiments.

A nephanalysis, prepared from pictures taken by TIROS III on its second orbital pass, was transmitted on the National Facsimile Circuit at 2:40 p.m. on the day of launching. The quality of the photographs from this satellite is excellent. Special sky-cover observations, timed to coincide with the passage of TIROS III over the continental United States, have begun at selected stations.

A Marine Automatic Meteorological Observing Station (MAMOS) was anchored in the Gulf of Mexico, about 300 miles due south of New Orleans (25° north latitude, 90°west longitude), on July 19. This is the same automatic station that first detected Hurricane Ethel last year. The Navy's term for the station is NOMAD (Navy Oceanographic Meteorological Automatic Device).

On June 3, High Seas Radiotelephone Station WOO at Ocean Gate, N.J., began twice-daily broadcasts of Weather Bureau warnings for the western North Atlantic. Transmissions are at 8 a.m. and 8 p.m. EST, employing frequencies in the 4, 8, 13, and 17 megacycle bands. These broadcasts were arranged by the Weather Bureau and the American Telephone and Telegraph Company as a service for smaller vessels equipped only for radiotelephone communication.

The National Meteorological Center has recently been reorganized. The National Weather Analysis Center has become the Analysis and Forecast Branch; the Extended Forecast Section is now known as the Extended Forecast Branch; and the Joint Numerical Weather Prediction Unit has been divided into two branches, the Computation Branch and the Development Branch.

Local hurricane warning conferences were held in 11 cities in North Carolina and Florida during June. These conferences were initiated by the Weather Bureau to ensure that the hurricane warning service will be effective at the community level.

Authority to administer personnel management activities through grade GS-11 has been delegated to the Regional Personnel Offices, PSO Honolulu, and the National Weather Records Center, effective July 1. This authority includes all action on grades through GS-11 except Meteorologist in Charge positions and certain special services. Before July 1, Field Personnel Offices were responsible for action on positions through the GS-9 grade.

Briefs from the CO Staff Conferences

The Chief of Bureau spoke about the great emphasis given to planning, especially plans in the range of ten years, by the present Administration. He stressed the importance of getting ahead with the Bureau's Grand Plan, which should be broad and go beyond the scope of our present activities.

Jack Thompson, Chief of the Office of Planning, reported that the Task Force on Long Range Planning of the National Academy of Sciences' Committee on Atmospheric Sciences is making good progress under the leadership of Dr. Sverre Petterssen. Twelve Weather Bureau meteorologists, in addition to Dr. Reichelderfer, are members of the Task Force.

The President's Latin American Science Program is being developed under the general guidance of Dr. J. Wiesner. Proposals for meteorology are now incorporated in the broad plan, and a task group covering the earth sciences has been set up under Professor Petterssen.

Dr. Reichelderfer discussed the importance of interdepartmental coordination in meteorology, particularly in the areas of research and development. He emphasized that it is the Bureau's responsibility to take the initiative in bringing about this coordination. Our first action should be to develop a list of current projects in research and development in meteorology and related fields.

The Instrumental Engineering Division was reorganized after the retirement of Mr. Thickstun. For an interim period, the Development Function of IED will operate under the Office of Meteorological Research. The Maintenance and Service Functions will operate under the Observations and Station Facilities Division. Mr. Foskett will continue to head the Development Function and will report directly to Dr. Wexler. The Maintenance and Service Functions will be supervised by Mr. McBirney, who will report to Mr. Showalter.

Mr. Kutschenreuter announced that arrangements have been made through the World Meteorological Organization for the distribution of satellite nephanalyses over the Northern Hemisphere Exchange Network. The United States has proposed an interim code for use in distributing these analyses to all WMO members.

Mr. Vernon and Mr. Means discussed the plans for implementing the extended agricultural and fire-weather programs for which funds will probably be available in the FY 1962 appropriations. Extensions of these services will be made within the framework of the current overall forecasting and weather services organizations of the Bureau. The areas into which the services are to be extended must be surveyed in order to select observing points and establish communications support. Plans for the new services are well advanced, and no major problems are anticipated. These and other new program increases will involve adding about 200 new meteorologist positions.

Atomic-Powered Automatic Weather Station To Be Installed in Northwest Territories

(The cutaway drawing on the cover shows how the atomic-powered weather station will be installed in the Arctic. The generator at the bottom of the cylinder derives its power from pellets of Strontium-90 via a thermoelectric conversion system. Photograph by The Martin Company.)

The world's first radioisotope-powered automatic weather station, developed through the cooperative efforts of the Atomic Energy Commission and the Weather Bureau, will be installed in Canada's Northwest Territories during August.

The unit was designed and constructed by The Martin Company of Baltimore, Maryland, under a contract with the Atomic Energy Commission's Office of Isotopes Development.

This unmanned, portable station measures barometric pressure, temperature, wind direction, and wind speed. The wind speed measurements have two values, the speed at the instant of transmission and average wind speed measured over an eight-minute period prior to transmission.

The observed information is sent into a telemetry package which stores the data and makes them available for transmission every three hours. There are provisions within the telemetry package to measure other factors, such as precipitation, humidity, and sky cover or relative lighting, when suitable sensors become available.

Weather information recorded by the station will be transmitted on two radio frequencies--3.36 mc. per sec. and 4.97 mc. per sec.--and may be heard up to 1500 miles away. Initially, the transmitted data will be received at Resolute Bay, about 300 miles from the station, and later may be received at Eureka or Alert.

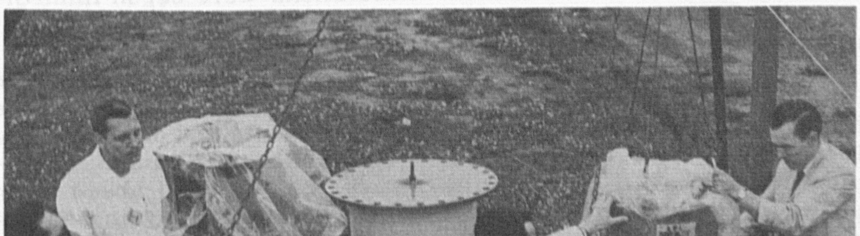
The station's power is derived from heat produced by the radioactive decay of long-lived Strontium-90, a by-product of the operation of nuclear reactors. Although the station will be used in remote and uninhabited areas, particular attention has been given to safety. The compound of Strontium-90 used for fuel--strontium titanate--is in pellet form. Each pellet is encased in several layers of an alloy that would take centuries to corrode, even if submerged in the ocean. Three-quarters of a ton of lead provides shielding against secondary radiation from the Strontium-90, and the entire generator is surrounded by a heavy outer casing of stainless steel.

The complete weather station consists of three towers and one metal cylinder. Two towers hold the transmitting antennas; the third tower holds the anemometer, the thermometer, and the coaxial cables leading to the transmitting antennas. The cylinder, containing the generator, the transmitter, and the aneroid barometer, will be buried in the earth at the side of the instrument tower.

Because the generator has no moving parts, it sustains no wear, and long-term maintenance-free operation is possible. The generator can power the weather station for more than ten years. Excess heat not converted to electricity is used to keep the electronic components of the weather station at an optimum temperature, thus ensuring their operating reliability.

Use of these automatic, unmanned devices in remote areas will help to fill some of the gaps in

(continued on page 118)



The generator for the new automatic station is lowered into a half-buried cylinder in preparation for operational tests of the device. Electronic components of the weather station are in the background at left. Photograph by The Martin Company.

Help Sped to Arctic Station In Recent Rabies Emergency

The quick action taken in a recent emergency at the Mould Bay Joint Canadian-U. S. Arctic Weather Station demonstrated how rapidly aid can reach such remote areas when it is needed.

On April 16, a white fox bit a Husky pup at Mould Bay; the fox was later attacked and killed by two older dogs. Michael Hanna, a Canadian radio operator, wanted the fox's pelt and, while skinning the animal, observed that the carcass was obviously diseased.

On May 5, the Husky pup bit a Canadian Meteorological Technician, T. H. York, on the thumb. The next day, the puppy became listless and ill, though it did not foam at the mouth.

When the pup was later seized with a fit, the people at Mould Bay consulted by radio with medical assistants at Resolute (450 miles away) and at Thule (about 1000 miles away). On the advice of physicians at Thule Military Hospital, Mr. Hanna, Mr. York, and the Husky pup were flown to Thule Hospital on May 7. The dog died after its arrival at Thule, with all the clinical symptoms of rabies. Its head and neck were then frozen and shipped to the Air Force Epidemiological Laboratories at Lackland Air Force Base in Texas.

Mr. Hanna and Mr. York immediately began taking rabies injections at the Thule Hospital. In Mould Bay, the two older dogs were shot on orders from the Royal Canadian Mounted Police.

The Canadian Government decided to send a party, including a doctor familiar with rabies problems, to evaluate the circumstances at Mould Bay. Dr. J. A. Hildes, Professor of Medicine at the University of Manitoba, Charles Goodbrand, of the Canadian Meteorological Services, and J. Glenn Dyer, Chief of the Weather Bureau's Polar Operations Project, left Ottawa on the morning of May 11 and arrived at the Mould Bay station late that evening.

After investigating, Dr. Hildes concluded that three additional men should be evacuated to Winnipeg for anti-rabies innoculations. Each of the three had cuts or bruises on his hands and had handled the sick puppy. These men were William E. Morse, Chief Airstrip Mechanic, and David O. Brunius, Meteorological Technician--both of the Weather Bureau--and R. C. Wheeler, the Canadian Official-in-Charge of the station. The three men were flown to Winnipeg General Hospital on May 12, and rabies innoculations were begun immediately.

This flight to Mould Bay was by far the fastest trip ever made into the Arctic and out again. The Royal Canadian Air Force provided a C-130 Lockheed with double crews to fly in and out of Mould Bay without interruption for crew rest.

Mr. Dyer had left Washington for Ottawa on May 10 with only 2-1/2 hours' notice and never got to bed until he arrived back in Washington on May 14.

All five of the men from Mould Bay have now completed the rabies innoculations and are back at the station. Laboratory tests at Lackland Air Force Base indicate that the Husky pup did not have rabies. The fox may have been rabid, but this can never be determined because the carcass was destroyed.

(continued from page 117)

the present observing network. Their reliability and maintenance-free characteristics make them particularly useful in polar regions that are accessible for only a short time each year.

The automatic weather station is now undergoing tests in Baltimore, Maryland, transmitting to Washington, D. C. After about 30 days of testing, the station and its components will be sent to Montreal for shipment to the Northwest Territories, where it will serve as a joint U. S. - Canadian weather station.

The station will be installed in the vicinity of Graham Island or on Sherwood Head, Axel Heiberg Island. The installation will be accomplished by a work party of eleven men: Donald Archibald, of the Canadian Meteorological Services; J. Glenn Dyer, Chief of the Weather Bureau's Polar Operations Project; Lewis E. Mills, a Weather Bureau Electronics Technician; an electronics engineer and two cameramen from the Martin Company; four student assistants; and a tractor driver.

A Canadian icebreaker carrying the work party will leave Resolute Bay between August 12 and 15 and will arrive in the vicinity of the installation site about August 18. A survey party will be landed by helicopter to select the actual station site and to orient the antenna system so that excavation can begin immediately once the entire party is ashore. The remaining personnel and essential cargo support will be landed by barge from the icebreaker.

Because of frozen ground conditions, it will be difficult to bury the steel cylinder deeper than four feet, but the apparent depth of the capsule will be increased by mounting dirt around it. Excavations for the tower supports probably will occupy the greatest amount of time.

If everything goes according to plan, the station will become part of the regular North American reporting network by about August 25.

PWP Man Forecasts for 'Project MOHOLE'

Melvin Fields, of the Pacific Weather Project, was detailed to Project MOHOLE during the spring to provide meteorological support for the drilling program.

Project MOHOLE, a program of the National Science Foundation and the National Academy of Sciences, is attempting to drill through the earth's crust to the Mohorovicic layer. The operations during March and April were intended primarily to test the equipment and to determine the feasibility of the Project.

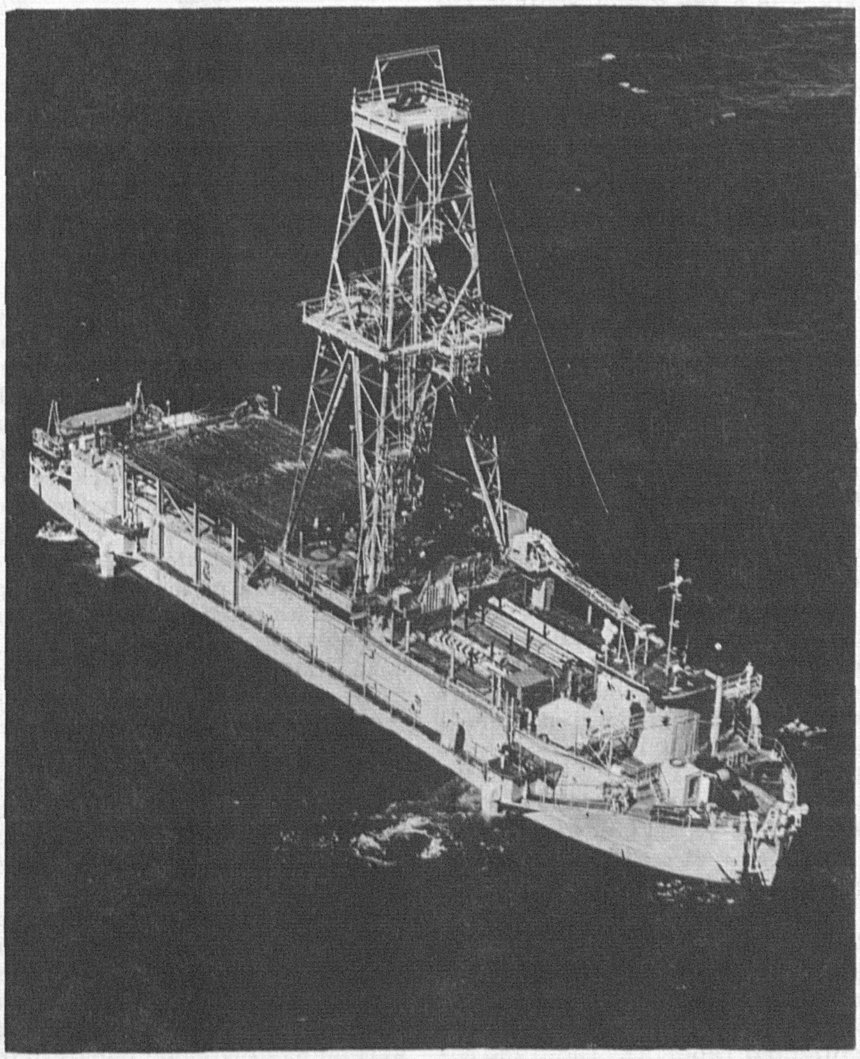
Working with MOHOLE project leaders, the Meteorologist in Charge in Los Angeles, the Alameda Fleet Weather Facility, and the Scripps Institute of Oceanography, Mr. Fields arranged the necessary communications and flow of weather information to the drilling site. He made observations throughout the program and provided forecast service literally on a 24-hour basis during the major portion of the drilling.

The drilling rig was first tested at a point about 20 miles off La Jolla, California, in about 3,000 feet of water. During this test a core was taken at a depth of about 1,000 feet below the sea floor.

The barge was taken to San Diego for minor repairs and towed to a site off Guadalupe Island where the water depth is 12,000 feet. To maintain the vessel's position over the hole, 6 taut-wire-anchored buoys with sonar transponders and radar reflectors were placed as reference points. By monitoring the relative position from the sonar transponders and radar reflectors, the barge could be maintained in a fixed position.

Winds of 20 to 25 knots continued throughout much of the period, with sea and swell conditions occasionally reaching 12 feet. Mr. Fields prepared twice-daily 24-hour forecasts and special forecasts as needed, based on information forwarded by the Los Angeles Weather Bureau Airport Station and the San Diego and Alameda Fleet Weather Facilities. No time was lost due to severe weather conditions.

Two cores were taken from the first hole drilled at Guadalupe Island, one at 150 feet below the bottom and one at 324 feet. A second hole was drilled to 560 feet, where basalt was encountered. An attempt was made to recover as nearly as possible continuous sediments from 200 feet to about 500 feet. The entire program in the Guadalupe area was very successful.



"Cuss I," the drilling rig used in Project MOHOLE. Photograph by the Global Marine Exploration Company.

Two MIC's Solve Some Severe Weather Problems

Severe Weather Corps

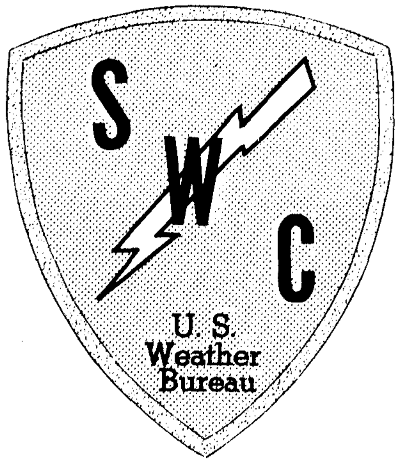
by G. N. Brancato, MIC, WBAS, St. Louis, Mo.

During the years when the Air Defense Command maintained a filter center in St. Louis, a high degree of cooperation was established between its Ground Observer Corps and the local Weather Bureau office. To keep the volunteer observers active and interested, considerable emphasis was given to the weather reporting phase of their activity. Consequently, a large number of severe local storm observers was recruited in the area, and a very capable local operations group was developed in the filter center.

When the Ground Observer Corps program was discontinued, the GOC observers in Illinois were absorbed by Civil Defense, but no such provision was made in Missouri. In order to retain the Missouri GOC observers in the Weather Bureau's severe local storm reporting program, the observers in our area of responsibility were invited to transfer to a corresponding organization under direct Weather Bureau supervision.

Mimeographed notices, questionnaires, and instructions were distributed at the time of the dissolution of the Ground Observer Corps, and organizational meetings were held in St. Louis. To keep some of the flavor of the original organization and to identify it as a distinct, new organization, the new group was named the Severe Weather Corps.

A separate Communications Section was organized. This group developed amateur radio nets and established local collection centers. The local centers collected reports by radio and relayed them by telephone to the Weather Bureau or set up portable equipment in the Weather Bureau for the collection of reports during severe weather situations. The Communications Group also organized a Mobile Unit consisting of some 20 or 30 amateurs with radio equipment in



their cars, who set up a screen of observers at strategic points west of the metropolitan area.

The non-radio members of the Severe Weather Corps were organized under the Observations Section. These members report by telephone to the Weather Bureau or to a local collection center. During storm situations, the members of the Observations Section also provide assistance at the Weather Bureau Office.

In 1960, the Communications Section was discontinued, and its members are now included in the Severe Weather Corps.

Meetings are held on the second Tuesday of each month, and programs consist of weather films or discussions by local meteorologists.

To help maintain the esprit de corps, the group adopted an emblem. Identification cards were bought with the organization's funds, and a local radio station has provided decals of the emblem for use on automobiles.

This year, Madison County, Illinois, radio amateurs organized an amateur radio club, under the auspices of the Madison County Office of Civil Defense, to provide for better collection of reports by radio in the Weather Bureau office. A two-meter, 25-watt FM station with a high gain vertical antenna has been borrowed from the Madison County OCD and installed at the Weather Bureau. The Severe Weather Corps members expect to buy better equipment with donations from interested communities. The equipment at the Weather Bureau is operated by licensed amateurs who live or work in St. Louis County convenient to the airport.

Radio amateurs in the southern half of Illinois have established "Weatherbird Nets." These networks are organized so that all calls are relayed to a "net control" station, which then relays the message or report to the station at the Weather Bureau. In many cases, county OCD communication centers act as the "net control" stations. These radio networks have been in operation during two severe weather periods, and indications are that this method of obtaining reports will prove very effective and rapid.

Use of radio hams to observe, collect, and transmit weather reports has many advantages. There is no cost to the Weather Bureau, and messages are received quickly, even when telephone or power lines are down. Plans are now underway to organize "Weatherbird Nets" in Missouri.

Severe Weather Warning Conference

by J. H. Huff, MIC, WBAS, Fort Smith, Arkansas

Each spring for the past six years, I have visited practically every community in our 12-county area of responsibility to try to create interest in local severe weather warning networks as well as give instructions in tornado safety precautions.

I have often wondered just how much I have accomplished during these visits. Each meeting has been concluded with an agreement to cooperate. We have found that in most cases each one was sincere in his promise, but we began to have doubts that their plans for mass dissemination of warnings were adequate.

We decided to hold a Severe Weather Warning Conference to determine just how well prepared each community is for protection against severe weather. The local Civil Defense Director was anxious to participate in the project and even agreed to help bear part of the expenses involved. We sent invitations to our key people in the area requesting them to attend the conference. These included sheriffs, police officials, radio and TV station managers, Civil Defense personnel, mayors, and Red Cross representatives. To our surprise, practically every person that we invited made a reservation to attend.

The meeting was held on February 28. The morning session consisted of films on air masses and fronts, followed by films on tornadoes and tornado warnings. After each film we had a short discussion period. After lunch, we took the group on a guided tour of our facilities and demonstrated exactly how a forecast and warning situation is handled by this office. We attempted to show each person how he fits into the overall picture.

The interest displayed in this meeting clearly showed us that our efforts in training the people in this area have not been wasted. We have had numerous requests for another meeting to train workers in community storm warning network procedures.

Federal Aviation Agency To Develop Common Aviation Weather System

The project formerly known as 433-L has been split into two separate projects, one to be managed by the Air Force and the other by the Federal Aviation Agency. The purpose of these programs is to develop improved methods for collecting, processing, disseminating, and displaying weather information for aviation.

Under the new arrangement, the Air Force will handle research and development on weather problems that are peculiar to air warfare. The Air Force project is still known as 433-L.

The Federal Aviation Agency will manage the research and development of a system that can serve the common weather needs of military and civilian aviation. The FAA's project is called the Common Aviation Weather System. This system will be automated as far as is technically feasible and economical.

The Weather Bureau will cooperate with the FAA in carrying out the research and development program for the Common Aviation Weather System. David G. Fordham of the Weather Bureau has been assigned to work full-time with FAA in this program.

Three research projects connected with the Common Aviation Weather System have already been undertaken by the Weather Bureau. The Office of Meteorological Research is preparing weather inputs for simulation tests of an air traffic control computer. The National Meteorological Center is developing methods of forecasting winds aloft and transferring them into suitable form for automatic input to an air traffic control computer. The Instrumental Engineering Division is working on improved observing equipment and is in the process of procuring several AMOS IV automatic weather stations for the Federal Aviation Agency.

Since the program is now only in the research and development stage, no implementation plans have been made. Present thinking is that improvements will be incorporated in the Weather Bureau's observing and forecasting program and in FAA's Air Traffic Control program as they become available.

Kansas City Budget Analyst Gets 'Inside Dope' on Washington

When Victor E. Stoll, Jr., Budget Analyst at the Kansas City Regional Administrative Office, was preparing to attend the recent conference of Budget Analysts in the Central Office, he had first-rate help in planning his stay in Washington.

Mrs. Stoll, who was making the trip with her husband, called the Truman Library in Independence for information about the Nation's Capital. A kind and knowledgeable gentleman answered her questions. At the end of the conversation, Mrs. Stoll thanked the man and asked his name. The answer: "Harry Truman."

The former President wrote a long letter to the Stolls, telling them more about Washington and enclosing passes to the White House. Mr. Truman also arranged a special tour of the Capitol for the Stolls.

Forecaster Gives Recipe for Better Ink

There are many interesting old letters in the files of almost every Weather Bureau office. This circular letter, for example, was distributed to all Weather Bureau stations in November 1904.

CIRCULAR

The following letter, dated May 25, 1904, from Mr. P. McDonough, in charge of the Palestine, Tex., station, is quoted for information of all stations:

"For the information of the Bureau, and as it may be a source of economy in the public service, I beg leave to report that a very high grade of copying ink can be obtained from immersing old typewriter copying ribbons in water. At least a pint can be obtained from each ribbon. It is my opinion that this would be a good way to utilize the old ribbons, and would save to the Government nearly the cost of the copying ink now furnished the different departments. I have used the ink thus obtained, and find it is of much better quality than the ink purchased in the local market."

The Division of Supplies has experimented in the matter as presented by Mr. McDonough with results corresponding to those found by him.

By direction of the Chief of Bureau.

(signed)
Chief, Division of Supplies.

If you have any old documents that you would like to share with others, please send them to the TOPICS Editor. They will be returned after they are used.

'Ring-Through' Device Used at Three Stations

Herman G. Stommel, a Meteorologist in the Central Office, was recently awarded $190 for his part in developing a time-saving "Ring-Through" telephone device for Weather Bureau stations.

In the "Ring-Through" system, people who call the Weather Bureau number first hear a recorded forecast. If the caller needs further information, he can hold the line open, and the call will ring through to the Weather Bureau office.

Mr. Stommel worked with the telephone company to develop the "Ring-Through" equipment while he was assigned at Seattle. It was first used at that station and is also in operation at Birmingham, Alabama, and Springfield, Illinois.

Stations using the "Ring-Through" system report that personally answered calls have been reduced 75 percent, saving an estimated $2,200 per year at each station.

Nine Weather Bureau Men Attend Revised Program In Agricultural Meteorology

In the past four years, more than 75 meteorologists have received training in agricultural meteorology at the joint Weather Bureau-University of Maryland summer institute.

This training program has now been revised to prepare meteorologists for positions as agricultural weather forecasters or advisory agricultural meteorologists at key Agriculture Experiment Stations. The change was made in anticipation of an increase in joint Federal-State-Local farm weather services similar to the Delta area pilot project.

Nine Weather Bureau meteorologists from Regions II and III attended the revised program at Iowa State University's graduate school. Those selected for this training were: Lester L. Benson, WBO, Lakeland; Cecil E. Carney, WBAS, Memphis; Doyle Cook, WBAS, Louisville; William L. Denmark, WBAS, St. Louis; Dwight Stoffer, WBAS, Indianapolis; Donald Downey, WBAS, Bismarck; Guy H. Gray, WBAS, North Platte; John Measells, WBAS, Jackson, Miss.; and Oliver Newton, WBAS, Brownsville.

It is expected that this program will be continued at another university during the coming academic year.

Suggestion Award Winners

Herman G. Stommel	F&SR Div., CO	$190
Alma R. Heinly	General Services Section, CO	50
Earl M. Bates	WBO, Walla Walla, Wash.	25
William T. Hodge	NWRC, Asheville, N.C.	25
Dorus D. Alderman	WBAS, Mobile, Ala.	15
John H. Cornish	RFC, Tulsa, Okla.	15
Willard E. Dickinson	Hydrologic Services Div., CO	15
Ella A. Gressett	RAO, Ft. Worth, Tex.	15
Faye M. Lacy	Procurement & Supply Section, CO	15
Donald L. Mark	WBAS, Muskegon, Mich.	15
Andrew D. Robb	WBO, Topeka, Kans.	15
Edward Sable	WBO, Boston, Mass.	15

Man Must Monitor Mechanical Marvels (Many Make Mistakes)

Machines are tireless, willing, uncomplaining and generally work with equanimity, speed, and accuracy.

By contrast, the human observer is subject to spring fever, becomes tired, loses his "morale," may be upset by a spat with his wife, and even at his best cannot approach the speed, productivity, and accuracy of the machine.

The machine is almost an ideal employee. It misses achieving this enviable status because it has one tragic fault. The machine is abysmally stupid. Even though it is generally accurate, it can and does make mistakes and, when it does, it puts out nonsense with the same assurance and enthusiasm with which it puts out facts.

The moral to this is that the human observer with his judgment and "nonlinear" reactions must remain ever watchful and alert to monitor the machine output.

Paragraphs 5350 - 5353 of Change 7 to Circular N require weekly checks on the hygrothermometer. Paragraphs 2721 and 2722 provide for calibration of the transmissometer.

Experience with wind speed components of the F-420 wind system indicates that speed may, on occasion, be in error by 50 percent. Errors in azimuth indication are also possible.

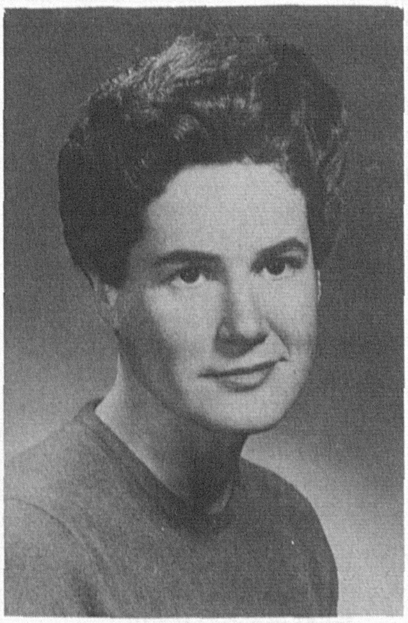
The readout on the azimuth and elevation of the WBRT or the GMD-1 may slip or be shifted between observations. Similar occurrences may adversely affect the orientation of a radar.

Are you as an observer keeping close tabs on your efficient but fallible servants? Are you making weekly checks on the hygrothermometer? Do you make frequent checks to be sure that wind speed, wind direction, and visibility as determined by visual observations are reasonably close to the data produced by the automats? Do you check the azimuth and elevation printout of the rawinsonde receiver before release of every radiosonde?

A prime characteristic of the efficient employee is a dedication to the task of maintaining a high quality product. "Eternal vigilance is the price of freedom" from error in our meteorological observations. Let's all keep a constant and critical eye on machine output.

Woman Serves as Weather Consultant On Flying Farmers' Tour of Alaska

Jessie M. Lippincott, a Meteorologist at the Anchorage Weather Bureau Airport Station, served as weather consultant for members of the National Flying Farmers' Association on their recent tour of Alaska. Miss Lippincott flew her own plane on the trip.



Jessie M. Lippincott

The pilots met at Calgary, Alberta, on June 18 and flew to Fort St. John, Whitehorse, Fairbanks, Mt. McKinley Park, Anchorage, and the Arctic Circle, finishing their tour on June 28.

Miss Lippincott began her Weather Bureau career at the Airport Station at Baltimore, Maryland, in June, 1944. Somewhat more than a year later, she satisfied a lifelong ambition by learning to fly and received her private license in March, 1946. In May, 1950, she passed all the requirements for her Commercial Airman's Certificate.

To supplement her on-the-job training in weather observing and pilot briefing, Miss Lippincott took two courses in meteorology offered by Johns Hopkins University. Further formal training has been obtained through correspondence courses from Pennsylvania State University.

In 1953, she bought her first airplane, a Cessna 140. She gained valuable flying experience in this plane, and when she accepted an assignment to the Weather Bureau Airport Station at Anchorage in September, 1954, she flew the Cessna 140 across the States and up the Alaska Highway to Anchorage. To quote Jessie, the trip was "a wonderful introduction to mountain flying, and to a magnificent country."

In 1956, she replaced the Cessna with a Piper Pacer and, four years later, she sold the Pacer and became part-owner of a Cessna 180.

At the Anchorage Forecast Center, most of Jessie's work has dealt with briefing pilots. A great number of "bush" pilots operate out of Anchorage, and her association with these experienced fliers has greatly increased her knowledge of light plane operations in this sub-arctic climate of extremely varied terrain.

Welcome to the Weather Bureau

Mary Virginia Bond, Clerk-Typist, Central Office
Charles A. Braun, Construction & Maintenance Representative, New York
Fee S. Chin, Physicist, Mauna Loa
Wilma E. Cioeta, Secretary, Portland, Ore.
Lou Ann Davidson, Meteorologist, Central Office
Gloria H. Dent, Mathematician, Central Office
Robert Larry Ferral, Agricultural Hydrologist, Central Office
Albert V. Griffin, Meteorological Technician, San Francisco
Linda S. Harding, Meteorological Technician, Barrow, Alaska
Benjamin P. Limcaco, Teletypist, Honolulu
Robert S. Roskuski, Electronic Maintenance Technician, Flint, Mich.
Charles O. Seiler, Meteorological Technician, San Francisco
Zane A. Suverly, Meteorological Technician, Stampede Pass, Wash.
Charles W. A. Travis, Jr., Engineering Technician, Miami
Albert F. Williams, Stock Handler, Central Office
Tracy A. Yamashiroya, Meteorological Technician, Johnston Island

New Student Trainees

August H. Aver, Jr., St. Louis
Michael G. Barry, Los Angeles
Michael O. Boss, Portland, Ore.
Donald A. Burrows, Spokane
Charles D. Casey, Fort Worth
William M. Clune, Fresno
Kenneth C. Crawford, Fort Worth
John Thomas Curran, Jr., Omaha
Max E. Ellis, Jr., Madison, Wis.
William G. Fortney, Central Office
William E. Geist, Charleston, S. C.
Allan V. Gustafson, Tallahassee
James K. Hall, Sacramento
Jon K. Hanlein, Portland, Ore.
William C. Herrmann, Oklahoma City
Ronald Lee Holle, Fort Wayne
Horace R. Hudson, Jr., Miami
Robert M. Huley, Central Office
Hugh L. Jones, III, Kansas City
Alan C. Lillyquist, Chicago
John F. Lohr, Lincoln, Nebr.
Walter A. Lyons, New York
William C. Mayes, Medford, Ore.
Bruce R. Mendenhall, Seattle
Robert L. Mitchell, San Antonio
Donald L. Ocker, Austin, Texas
Charles E. Orwig, Spokane
Larry G. Preston, Fresno
George W. Rippen, Madison, Wis.
Ruthiellen Serlin, Denver
Dennis J. Slaughter, St. Louis
David R. Smith, Waco
Ronald R. Stephen, Boise
Donald E. Stoltz, Madison, Wis.
Dennis L. Swindler, Central Office
Richard M. Wheeler, Central Office
Stan K. Wolley, San Antonio
William E. Wulf, New Orleans

Bureau's Relationship To Commerce Department Should Be Emphasized

Although the Weather Bureau is one of the largest agencies in the Department of Commerce, the public generally is not aware of the connection between the Weather Bureau and the Commerce Department. Rarely is the Bureau identified with the Department in newspaper stories, on the radio, or on television.

The Department of Commerce has recently asked all Weather Bureau employees to cooperate in an effort to achieve closer identification with the Department in the public mind. One way of doing this is to include the phrase "Department of Commerce Weather Bureau" in messages on local loops, direct radio broadcasts, and answering devices.

RETIREMENTS

Leland H. Johnson

Leland H. Johnson, a Meteorologist at the Pomona, California, Weather Bureau Office, retired on June 30. Mr. Johnson entered the Weather Bureau in 1920 as a messenger boy at Rapid City, South Dakota, and served thereafter at Omaha, Boise, and San Francisco. He has been at Pomona since 1929. Mr. Johnson's address is 115 West Kendall Street, P. O. Box #7, Corona, California.

Lucius P. Spicer

Lucius P. Spicer, who has been Official in Charge at the Weather Bureau Airport Station in Rome, Georgia, since 1948, retired on June 24. Mr. Spicer attended Emory University. He became a Junior Observer at Mobile in 1931 and served at Memphis, Adairsville, and Montgomery, before moving to Rome in 1945. Mr. Spicer's address is 105 North Elm Street, Rome, Georgia.

Length of Service Awards

40-Year Award

Robert A. Halverson, RAO, Salt Lake City

35-Year Awards

Ralph E. Gumpf, WBAS, Billings, Mont.
John A. Shirley, O&SF, Central Office
Willis A. Wood, O&SF, Central Office

30-Year Awards

Gean DiLauro, Jr., WBAS, Binghamton, N. Y.
Walter P. Roquemore, WBAS, Fort Worth
Thomas S. Southwick, O&SF, Central Office
Harry E. Torbitt, WRPC, San Francisco
Joseph A. Yeazel, WBAS, Winnemucca

25-Year Awards

Thomas J. Brennan, Pers., Central Office
August W. Hovland, WBAS, Bakersfield
Nathaniel A. Lynch, Adm. Ops., Central Office
Lawrence O. Oliver, WBAS, Great Falls, Mont.
Carl T. Prochnow, WBO, New Orleans
Thomas D. Whitely, Inst. Eng., Central Office

15-Year Awards

Carl M. Adamson, WBAS, Montgomery, Ala.
Herbert P. Benner, WBO, Sacramento
James W. Bordas, Adm. Ops., Central Office
George T. Dellert, OMR, Central Office
Kaui W. Dunn, WBAS, San Francisco
Edward E. Edstrom, NWRC, Asheville
Carl O. Erickson, OMR, Central Office
Walter D. Erwin, NMC, Central Office
Richard E. Hambidge, WBO, Sacramento
Lillian M. Hill, WRPC, Chattanooga
Betty M. Kanipe, NWRC, Asheville
Matthew H. Kulawiec, NMC, Central Office
John B. Smith, WBO, Pomona
Seymour Steiner, WBAS, Jacksonville
Yuji Takemoto, WBAS, Lihue, Kauai
Virginia H. Wilson, NWRC, Asheville

Awards for Superior Performance

John Baker	Juneau
Meda Bean	WRPC, Kansas City
Rosella Bilton	NWRC, Asheville
Harry Carle (Posthumous)	RAO, Anchorage
Virgil Coludrovich	Burrwood
Joseph Crubaugh	WRPC, Kansas City
Roberts Daniels	Barrow, Alaska
Dorothea Davis	McGrath
Richard Foster	RAO, Anchorage
Richard Foster	Central Office
William Harris	NWRC, Asheville
Robert Himberger	WRPC, San Francisco
William Hocking	WRPC, San Francisco
Milton Johnson	NWRC, Asheville
Alex Kish	Jackson
William Kuning	Central Office
John Measells	Jackson
Helen Merriam	CO, Met. Research
Leland Mosedale	NWRC, Asheville
Hobert Rector	NWRC, Asheville
Charles Sabine	NWRC, Asheville
David Smedley	San Juan
Richard Smith	AWRP, Atlantic City
Marie Snelling	NWRC, Asheville
Gilbert Stegall	WRPC, Kansas City
Verne Steves	WRPC, Chattanooga
Arthur Stotesbury	NWRC, Asheville
Charles E. Syverson	Boise, Idaho
Wilson Tschiffely	NWRC, Asheville
Margie Tucker	CO, Met. Research
Frederick Warren	NWRC, Asheville
Amey Wilson	RAO, Anchorage
Dr. Giichi Yamamoto	Central Office

GROUP AWARDS

CO, NWAC, Blueprint Unit
- William Fenwick
- Gertrude Gabriel
- Herbert Jackson
- Irene Kannar
- Evelyn Los
- Maude Smalls
- Henry Dixon
- Leroy Perkins
- Elsie Covington

OT&DC, Sterling
- Richard Bollinger
- Charles Lewis

WRPC, Chattanooga
- Dorothy Blakely
- Lucille Clouser
- Mamie Orrell

WRPC, San Francisco
- Easter Davenport
- Jewell Jones
- Jean Norwood

Meteorological Readings

Assignment No. XLIX: The Weather and Circulation of March 1959, by Carlos R. Dunn, Monthly Weather Review, Volume 87, Number 3, March 1959.

About the Assignment: This article deals with the mean circulation as related to anomalous weather features during March 1959. Particular attention is given to features leading to record cold in Alaska.

QUESTIONNAIRE

Col. 61 According to this article, in order for the 700-1000 mb thickness to average below normal for March in Montana, the following is necessary:
1. Much above normal precipitation
2. Little sunshine
3. Presence of polar continental air masses
4. Presence of an intense Aleutian low

Col. 62 The primary wind maximum in the Atlantic in March 1959 was
1. 11 mps above normal
2. Near its normal longitudinal position
3. Near its normal latitudinal position
4. 8 mps above normal

Col. 63 Check the correct statements:
1. Nome and Anchorage, Alaska, experienced the coldest March on record
2. The Hawaiian Islands experienced record-breaking warm weather
3. Nebraska, Wyoming and Florida all had record-breaking amounts of precipitation
4. None of the above is true

Col. 64 An outstanding feature of the prevailing weather in March 1959 was:
1. The above-normal temperatures throughout all the United States
2. The warm, wet Hawaiian weather
3. The unusual cold in Alaska
4. The anomalous westerly flow centered on the U. S.

Col. 65 In figure 11 the negative values just off the northeastern coast of the U.S. are not consistent with the mean 700 mb circulation over this area because:
1. very little precipitation fell here
2. of frequent invasions of warm, moist air
3. cold, subsiding air frequently invaded it
4. the vertical motion values are apparently in error due to the scarcity of data

Col. 66 Most of the precipitation in March over the U. S. :
1. was produced by major storms
2. occurred where the temperature was above-normal because of vertical motions
3. was nearly normal in amount except over Florida
4. was not too closely related to areas with positive 30-day mean vertical motions at 600 mb.

Col. 67 In considering the mean 700 mb hemispheric circulation for March 1959, the high latitude wave train was distinguished from that of the middle latitudes by
1. smaller amplitude
2. greater negative height departures
3. larger wave number
4. uniformly greater zonal flow

Col. 68 The unusual warmth along the California coast during March of 1959 was due primarily to:
1. abnormal sea-surface temperatures
2. above-normal heights and northeasterly flow at 700 mb
3. below average stability and above-normal precipitation
4. absence of foehn winds and above-normal humidity

Col. 69 In March 1959 the most pronounced departure in 700-mb heights were in the vicinity of
1. Alaska
2. The Eastern Pacific
3. Europe
4. Greenland

Col. 70 During the month of March, the precipitation which fell east of the Rockies:
1. was predominantly associated with orographic effects
2. was only poorly correlated with the 30-day mean vertical motions
3. Showed maxima which were associated with negative vertical motions
4. occurred under weak easterly anomalous flow and cyclonically curved 700 mb flow

Harms and Hood Get MIC Posts

Rheinhart W. Harms is the new Meteorologist in Charge of the Milwaukee Weather Bureau Airport Station. Mr. Harms succeeds Howard J. Thompson, who retired in April.

A graduate of the Wisconsin Institute of Technology, Mr. Harms worked in private industry before entering the service in 1942. He attended the Air Force Meteorological Cadet School at Chanute Field and served as an Air Force meteorologist until 1946.

Mr. Harms' first assignment with the Weather Bureau was in Bermuda, as a Meteorologist at Kindley Field. He later served in New York, Bridgeport (MIC), Hartford (Principal Assistant), Fort Wayne (MIC), and the Central Office. He has been State Climatologist for Illinois since June 1960.

Frank C. Hood, formerly MIC of the Asheville Weather Bureau Office, is the new Meteorologist in Charge of the Weather Bureau Airport Station at Baton Rouge, Louisiana.

Mr. Hood entered the Weather Bureau in 1924 as Assistant Observer at Ithaca, N. Y. Later assignments included Alpena, Mich.; Richmond, Va.; New Orleans; Montgomery, Ala.; and Lynchburg, Va. He has been Meteorologist in Charge at Asheville since 1941.

New FOSDIC Filmer

In Use at Asheville

FOSDIC Filmer #2, an improved camera for microfilming punched cards, has been placed in operation at the National Weather Records Center in Asheville.

FOSDIC Filmer #1 has been used at NWRC for several years and has reduced 70 million cards to film. This rate of filming has barely kept pace with the card acquisition rate of over 30 million per year. The backlog of about 350 million cards remains untouched.

The new filmer, with improved card feed and illumination, is twice as fast as FOSDIC Filmer #1 and microfilms 840 cards per minute. With both cameras in operation, it should be possible to microfilm the entire card library within the next three years.

Transfers

	from	to
John E. Birdsall	Isachsen, N.W. T.	Omaha
C. Benjamin Carnahan	Salem, Oregon	Anchorage
Clifford E. Goodall	Norfolk	New York
James A. Harding	Kotzebue, Alaska	Barrow
David E. Harmon	San Francisco	Nome
Robert L. Hazzard	Central Office	Barter Island, Alaska
Robert E. Helbush	Burlington, Vt.	Central Office
David M. Henry	Spokane	Missoula
James W. Holcomb, Jr.	Los Angeles	Portland, Ore.
Ray R. Jantz	Knoxville	Tulsa
Dolph A. Kipps	Columbia, S. C.	Richmond, Va.
Ronald J. McCue, Jr.	Barrow	Bethel, Alaska
John C. Nyhan	Asheville	Central Office
Paul J. Ogden	Jacksonville	Mobile
Theodore L. Oglivie	Charleston	Columbia, S. C.
Derrell M. Roe	Eureka	Alert, N. W. T.
James F. Scholten	Eureka, N.W.T.	St. Cloud, Minn.
Quentin R. Schroeder	San Francisco	Winnemucca
Thomas H. Shaffer	Boston	Pittsburgh
John A. Shelton	Central Office	Asheville
Harry F. Thomas	Antarctica	Central Office
David J. Weinbrenner	New York	Hartford

Woman Meteorologist

Wins Bureau Scholarship

Mrs. Hazel Tatro, a Meteorologist at the Weather Bureau Airport Station in Wilmington, N. C., has been selected for a one-year study assignment at Florida State University, beginning in September.

A native of Nebraska, Mrs. Tatro attended Nebraska State Teachers College and taught for five years. She served with the Waves from 1942 to 1945.

Mrs. Tatro, the mother of five children, has been with the Weather Bureau since 1945 and has taken many courses in meteorology at her own expense. She has been at the Wilmington station for the past two years.

DEATHS

Alvin N. Tehle

Alvin N. Tehle, a Meteorological Technician at the National Weather Records Center in Asheville, died on June 11. Mr. Tehle attended Lewis Institute and Northwestern University and ran his own farm until he joined the Weather Bureau. In 1937, he became an Airway Observer at Joliet, Illinois. He served with the Atlantic Weather Patrol in Boston, the Pacific Weather Patrol in San Francisco, and at the Weather Bureau Airport Station in Joliet, before moving to Asheville in 1953. His widow, Mrs. Alvin N. Tehle, lives at 28 Arthur Road, Asheville, N.C.

Armand L. Griggs

Armand L. Griggs, a Meteorologist in the Codes and Maps Section of the Central Office, died on May 27. Mr. Griggs came to the Weather Bureau in 1936 as a Junior Observer at Tampa and served at Lakeland and Galveston before moving to the Central Office in 1942. In 1954, he won the largest award ever granted to a Weather Bureau employee. A $600 annual salary increase was given to Mr. Griggs for initiating the use of a less expensive paper for printing manuscript map bases. It was estimated that the Bureau saved $13,000 a year by using the cheaper paper. Mr. Griggs is survived by his wife, Elizabeth, of 3932 Morrison Street, N.W., Washington, D. C., and a son, John.

Frederick W. Brist

Frederick W. Brist, who was Meteorologist in Charge at Memphis for more than 23 years died on May 30. Mr. Brist had been retired since 1944. He entered the Weather Bureau in 1897 at Dubuque, Iowa, and was later assigned to Detroit, Washington, Erie, Buffalo, Key West, New Orleans, Philadelphia, Baltimore, Norfolk, Denver, Thomasville, and Memphis.

Volume 20 JULY 1961 Number 7

CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

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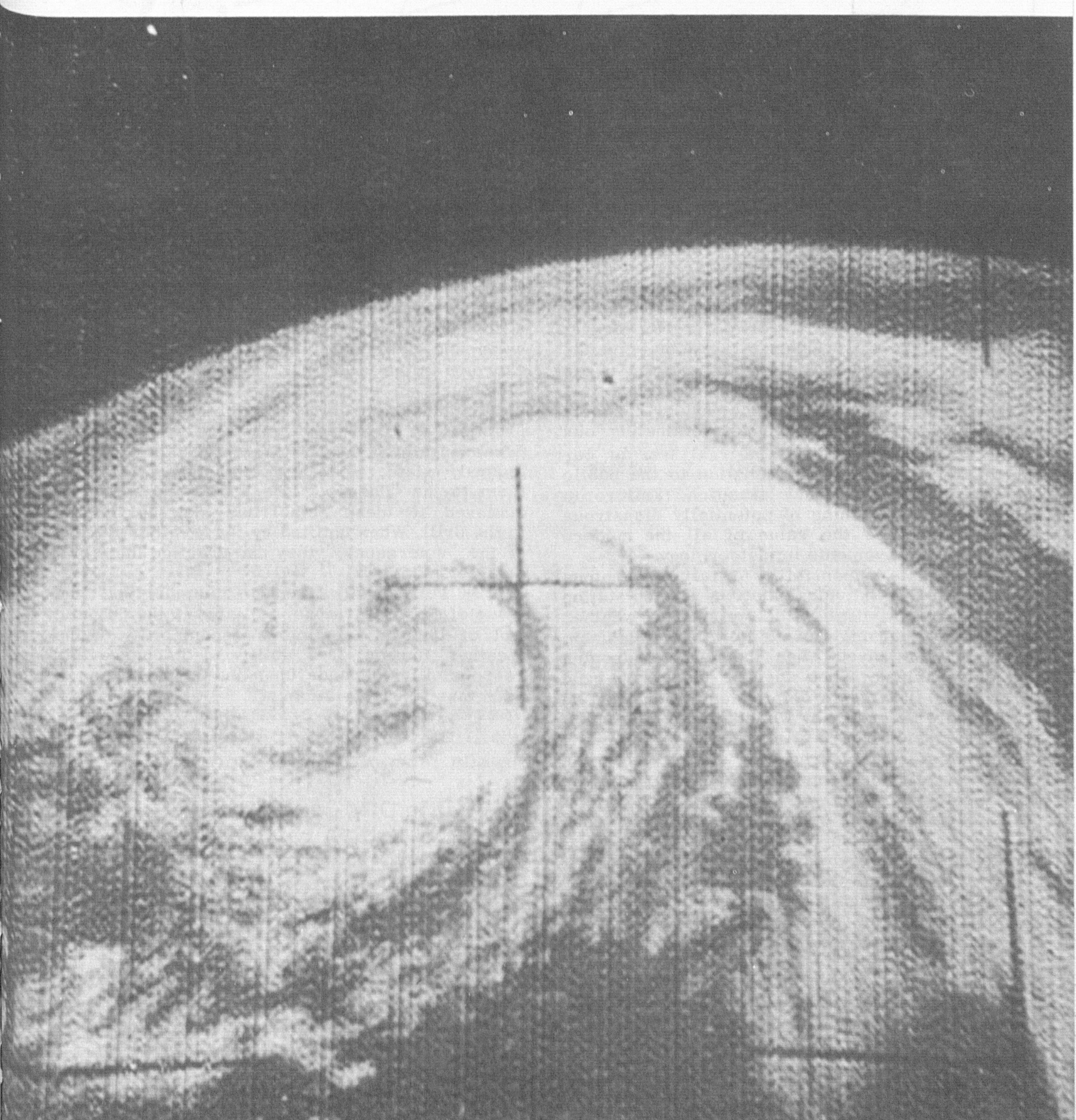
TOPICS



TIROS III VIEWS TROPICAL STORM LIZA

Editorial

Every Man A Sentinel

All of us in the Weather Bureau are justifiably proud of the improvements in forecasting that we have achieved in the past few years. The tools made available by modern technology have enabled us to issue forecasts with greater accuracy and increased speed. Research, both in the Weather Bureau and elsewhere, has given us new knowledge of weather processes. Studies presently underway on general circulation, hurricanes and severe local storms, storm surges, and floods, give us reason to hope that one day we may eliminate major forecast errors.

But even a perfect forecast is worthless if it doesn't reach the public. Many regular channels have been established for disseminating our routine daily forecasts. The real test of our ability to get weather information to the public comes in an emergency situation. Failure to give adequate warning of potentially disastrous weather nullifies the value of all the modern scientific achievements in meteorology.

The ultimate responsibility for issuing warnings rests with the individual station. If each station is prepared to deal with any type of weather emergency that might occur in its area, valuable time will be saved when the need for issuing warnings arises. When specific plans have been drawn up, showing in detail what actions will be taken, in what order, by which station personnel, much confusion can be eliminated.

The first step in preparing such a plan is the definition of what constitutes an emergency in the local area. For example, how much rain in what period of time will produce a flood? If each piece of information that contributes to the diagnosis of an emergency is identified, every forecaster can become familiar with the "symptoms." He can then recognize an impending crisis and consult with the Meteorologist in Charge to determine whether emergency plans should be put into action.

When danger signs begin to appear, the station staff will be alert and ready to act. This is the time to warn state and community officials of the potential danger. Radar observers and other Weather Bureau stations can be alerted to furnish additional, needed information.

When the actual crisis arrives, public warnings must be issued rapidly. If the staff on duty is not sufficient to handle both the emergency situation and the usual routine work, then routine activities must be put aside.

Another aspect of preparedness is drill. We have fire drills and Civil Defense exercises so that our actions in an emergency will become automatic. For the same reason, our Weather Bureau staffs need regular drills in procedures to be followed in each kind of weather emergency. Learning to deal with a real severe storm or flood threat without confusion or waste motion requires practice. Ideally, a station might have a tornado or flood practice in early spring, a hurricane drill in summer, and a heavy snow exercise in the fall.

In such an exercise, the actual situation is simulated as closely as possible. Staff members practice writing messages and warnings. By prearrangement, calls are placed to proper federal, state, and local authorities, alerting them to the "danger." The best results will be achieved if these authorities also participate in the drill. When notified by the Weather Bureau of the "emergency," they can practice their own disaster plans.

It is well for all of us to remember that "the issue of storm warnings" is listed in the Organic Act of 1890 as a primary responsibility of the Weather Bureau. Our ability to discharge this responsibility depends upon the preparedness of each man at each station.

P. H. K.

ABOUT THE COVER...

On July 19, TIROS III photographed Tropical Storm Liza west of Baja California. The position of the storm could only be estimated until the satellite photographs located its center at 25° N and 121° W.

Topigrams

Washington, D.C.
August, 1961

The Weather Bureau's Project Mercury Weather Support Group hit the front pages again in July, when the United States' second manned space flight was twice postponed because of weather. The delays were caused by cloud cover at the launching site. Skies in the launching area must be nearly clear during the early stages of the flight to pemit camera coverage of the vehicle. An easterly wave, which passed south of Cape Canaveral, and southerly winds at middle and upper levels made the period from July 17 to 21 particularly cloudy.

The launch originally scheduled for July 18 was postponed late on the previous day because of the forecast. The launch was rescheduled for July 19, the forecast for that day being "considerable cloudiness with some breaks." On the 19th, there was a break in cloudiness from 0600 to 0715 EST, but the operation was delayed long enough to miss this break. The launching then had to be postponed for two days, the time required to ready the vehicle for another launch attempt. On July 21, the forecast was similar to that of the 19th, but a sufficient break occurred to permit a successful launch.

The Weather Bureau and the National Aeronautics and Space Administration have invited more than 100 nations to send representatives to an International Meteorological Satellite Workshop that will be held in Washington, D.C., from November 13 to 22. Through lectures and laboratory work, meteorologists from all over the world will gain increased understanding of the usefulness of satellite data. The participants will use real satellite photographs to prepare weather analyses. In this way, they will gain practical experience in the use of satellite data distributed by the United States through international meteorological channels.

Glenn Sachse, MIC of the Norfolk, Virginia, Weather Bureau Airport Station, assisted station WTAR-TV in Norfolk in the preparation of a half-hour television documentary on hurricanes. The film, called "The Violent Ladies," was shown on July 27 and will be used again when hurricanes approach the Norfolk area. The Norfolk Chapter of the American Red Cross has commended the television station and Mr. Sachse for the program.

The American Red Cross has produced a $4\frac{1}{2}$ minute, 16 mm. sound film, "Hurricane Disaster Action," outlining the precautions to be taken when a hurricane threatens. Two hundred prints of the film have been distributed to Red Cross chapters in the southern and eastern states where they may be obtained on free loan for public release. A radio recording of hurricane instructions is being released in the same manner.

The pilot-to-forecaster weather service test, launched on July 1 in the Washington, D.C., and Kansas City, Missouri, air traffic control areas, is proving very popular. In a two-week period, about 800 calls for information were received by the 17 Weather Bureau forecasters assigned to the project.

Briefs from the CO Staff Conferences

Mr. Thompson reported on the progress of the Office of Planning in developing long-range plans for the Weather Bureau. The Office of Planning has been developing an outline of a five- to ten-year program, covering broad aspects of the Weather Bureau's future activities. A survey has been made of the basic weather service requirements of the general public and other segments of the economy, such as agriculture, transportation, business, and industry. Based on a preliminary analysis of these user requirements, a summary of the "production requirements" of a National Meteorological Service has been prepared. In preparing the Weather Bureau's plan, weather service requirements for the future five to ten years will be projected, and the influence of domestic, social, economic, and international factors, as well as other influences on weather needs, will be assessed. The plan itself will include a program for accomplishing the basic mission, using foreseeable technology, and an outline of the research and development required to overcome present and predictable deficiencies.

Mr. Lieurance reported that a lot of effort is being expended to determine the true causes of aircraft accidents. Weather is a factor in 38% of all fatal aircraft accidents. Millions of dollars are being spent in efforts to eliminate some of the less frequent causes, but very little is spent on the weather problem. Representatives of the aviation industry and appropriate government agencies are discussing this situation.

Flight safety is receiving great emphasis from the aviation industry and government. Safety clinics are being held throughout the country with Bureau personnel participating at both the local and national levels. Mr. Lieurance, who is a member of an Advisory Committee to the Flight Safety Foundation, has recently participated in the National Civil Air Patrol Safety Clinic at Houston, Texas, and the State of Connecticut Clinic at Hartford.

Mr. Simpson reported that the Miami Hurricane Conference, held in the latter part of June, was very well attended. There were approximately 200 officially registered, of which about 40 percent were Weather Bureau people. The papers presented at the conference set a new high in quality.

Mr. Vernon informed the staff that plans are going ahead for the installation of telephoto equipment for high-altitude facsimile transmission at 18 key forecast centers. At a later date, this equipment can be used for direct readout from operational satellites.

Congress has appropriated $758,000 for expanding Agricultural Weather Service Programs this year. Plans for implementation of these programs are well underway. The goal is to have all programs in operation by the beginning of the spring season.

TIROS III Makes Meteorological History

Among the more than 8000 photographs taken by TIROS III since its launching on July 12 are pictures of three tropical storms in the Northern Hemisphere.

On July 19, tropical storm Liza was known by weathermen to be located some distance out in the Pacific off the Mexican coast. Without benefit of reconnaissance or ship reports, Liza's position was estimated to be at 21° north and 123° west. It was believed that the storm was dying out.

Pictures taken by TIROS III on July 19 showed a distinct storm vortex centered at about 25° north and 121° west, or more than 300 miles from the estimated position. The San Francisco Weather Bureau Office was notified, and the position was corrected.

On July 20, another tropical depression, referred to as storm Madeline, was observed in the same area by TIROS III. Photographs from the satellite showed a thick cloud area 180 miles in diameter, centered at 14.1° north and 111.5° west, or about 600 miles off the Mexican coast.

Tropical Depression Advisory No. 4, based solely on the satellite pictures, was issued by the Weather Bureau Office in San Francisco and proved to be especially valuable to the tuna fishing fleet that operates off the coast of Mexico and southern California. This was the first time in history that a tropical cyclone advisory was issued on the basis of satellite photographs, with no supporting weather reports from any other source.

On the other side of the continent, TIROS III was programed to take pictures of Hurricane Anna, the first Atlantic hurricane of the season, on July 20, 21, 22, and 23. During this period, the hurricane was regularly penetrated by hurricane hunter and research aircraft. The combination of excellent satellite photographs and conventional data will give meteorologists additional information on the behavior of these severe storms.

Camera Failure

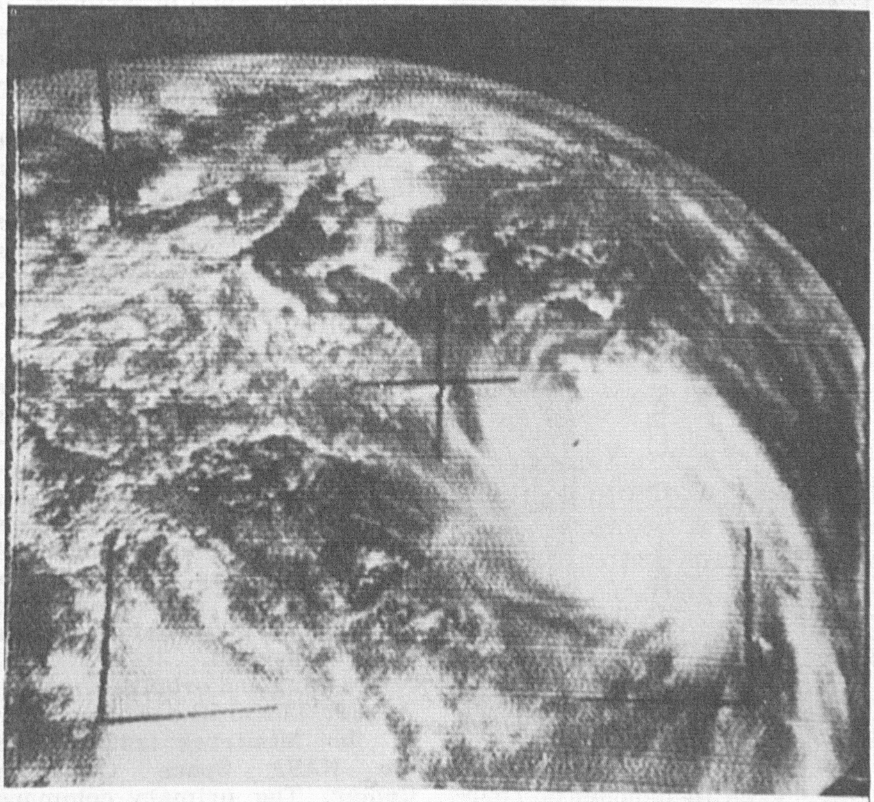
One of the satellite's two cameras failed on July 24, after taking 2020 excellent photographs of the earth's cloud cover. The cause of the malfunction is not yet known, and it is possible that the camera may be back in action later.

The camera failure was detected by the Wallops Island command and readout station, following the 170th orbital pass of the satellite. Camera number two, a duplicate of the first, was put into fulltime operation immediately.

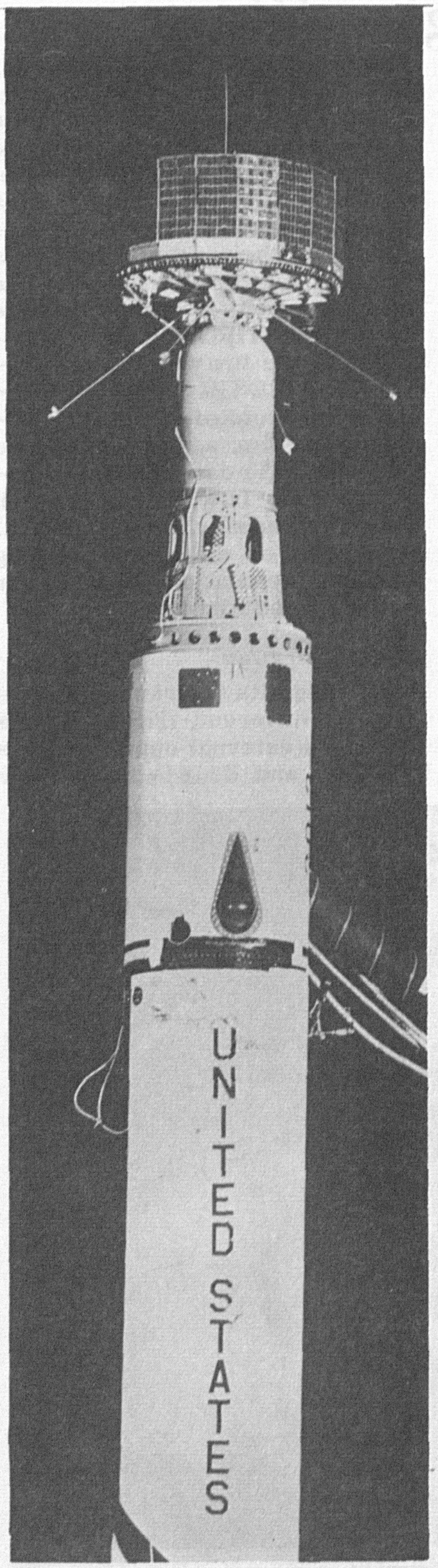
It was the possibility of just such a failure that led to the installation of two wide-angle cameras in TIROS III. The earlier TIROS satellites had carried both a wide-angle and a narrow-angle camera, but meteorologists who have worked with TIROS data feel that the wide-angle camera data are significantly more useful because of the greater coverage provided. After the decrease in picture quality of the wide-angle camera in TIROS II, it was decided to use two wide-angle cameras in TIROS III to provide back-up in the event of a similar malfunction. Also, a large number of narrow-angle data have been obtained from TIROS I and II which provided research material until such time as cameras providing similar resolution over wider areas are available.

Instrumentation

Although its instrumentation is slightly different, TIROS III has the same external appearance as TIROS I and II. It is shaped like



Hurricane Anna as seen by TIROS III on July 21. The coast of Colombia near Barranquilla is under the central crossmark, and Lake Maracaibo shows as a prominent dark area below.



TIROS satellite mounted on Thor-Delta rocket. NASA photograph

a pillbox, 42 inches in diameter and 19 inches high, and weighs about 287 pounds. Its sides and top are covered with solar cells, the primary power source.

The satellite was launched northeast from Cape Canaveral into a roughly circular orbit at an altitude of about 475 statute miles. The period of rotation of this orbit around the earth is about 100 minutes. Because the orbit is inclined at 48° to the equator, meteorologically useful data cannot be obtained closer to the poles than about 55° latitude.

The two wide-angle cameras contained in the satellite are designed to photograph the earth's cloud cover under daylight conditions. When the cameras are pointed straight down, they view areas approximately 750 miles on a side.

TIROS III carries the same radiation sensors contained in TIROS II, plus a radiation experiment designed by Professor V. Suomi of the University of Wisconsin. This experiment is essentially the same as that on Explorer VII, which was also designed by Professor Suomi. By measuring the heat radiated toward earth by the sun and the amount that is re-radiated from the earth's surface and atmosphere, the thermal radiation characteristics of the earth can be determined. The radiation experiments are operating satisfactorily.

The cameras and other electronic equipment in TIROS III are operated by improved remote control programers. New transistorized circuits trigger the operation of the cameras at any desired point in orbit. The new circuits replace an arrangement of moving parts in the earlier TIROS "clocks" and are expected to increase the reliability of the satellite system.

Tracking and orbit determination for TIROS III are carried out by the Minitrack network and the NASA Space Computer Center. The primary command and data acquisition stations are at Wallops Island, Virginia, and Point Mugu, California.

During the operational lifetime of TIROS III, first-order Weather Bureau stations in the continental United States will be requested to make special cloud-pattern observations at times when the satellite is photographing their area. These observations will be used to study the relationship between surface weather conditions and the cloud patterns seen by the satellite's television cameras.

The Meteorological Satellite Laboratory has made some changes in the method of depicting satellite cloud data for facsimile transmission. These changes which became effective with the launching of TIROS III, are designed to simplify procedures and to give a more graphic presentation through the use of stippling and hatching.

International Program

On July 19, the directors of 104 national meteorological services were invited by the Weather Bureau and the National Aeronautics and Space Administration to take part in a cooperative observation program in connection with TIROS III. A special nine-week period of international cooperation will begin on August 8 and will cover a full cycle of the satellite's orbit.

The recent second session of the CSM Working Group on Telecommunications made provision for worldwide distribution of TIROS III nephanalyses. These transmissions began on July 19. The nephanalyses are transmitted at 3-hour intervals, whenever they appear likely to be useful to other services. In addition to the nephanalyses, a 24-to48-hour forecast of areas to be photographed and a seven-day outlook of future satellite operations are also planned to be transmitted once daily. The WMO has distributed information on the nephanalysis and ALERT codes to all of its Members.

National Severe Storms Project Completes 1961 Field Operations

A large amount of useful data was collected during the 1961 field operations of the National Severe Storms Project (see TOPICS, April 1961), which extended from March 15 through June 3.

The staging area for the 1961 operations was Oklahoma City, with field headquarters in the National Guard Hangar at Will Rogers Field. Aircraft participating in the Project were based at Will Rogers Field and Tinker Air Force Base.

The field headquarters was equipped with drops on five teletypewriter circuits and two facsimile circuits, HF radio communication, and a hotline telephone circuit to Fort Sill, Kansas City, Tinker Air Force Base, and the Oklahoma City Weather Bureau Airport Station. A staff of meteorologists and plotters at headquarters prepared comprehensive charts and analyses in support of the operational missions.

Observational facilities used during the spring operations included aircraft, surface networks, the rawinsonde network, a special pibal network, radar networks, and equipment for stereo and conventional photography.

Aircraft missions were flown on 29 days. Two of these missions were in northeastern Colorado for hail studies in conjunction with Colorado State University. The maximum number of aircraft participating on any one day was 9 on April 24, and the average number participating on an operational day was 4. On more than one occasion, data were obtained from storm cells that contained funnel clouds.

The decision as to whether a mission would be flown was usually made by evening on the preceding day. If the decision was for a mission, forecasts of significant weather were prepared early on the morning of the mission day. Although these forecasts were discussed with the SELS Center at Kansas City, project aircraft usually were committed to their mission before the formal issuance of a forecast by the SELS Center.

On mission days, forecasts and flight plans were usually complete by 9:30 a.m., when project personnel assembled for a briefing on the expected weather and a discussion of the flight plans.

Once the decision was made to fly a mission, supplemental observations were requested. These included serial rawinsonde observations and radar photography at locations covering the area of interest.

During the flying of a mission, project personnel monitored conditions closely. In some instances, plans were modified in flight to take advantage of conditions not foreseen in the early morning briefing. FAA controllers detailed to the project provided control of the aircraft.

Flight crews were interrogated after the missions, and records were kept of significant aspects of the individual flights.

Several of the military planes were damaged by hail and lightning during the operations. One Weather Bureau DC-6 suffered structural damage from lightning while en route from

NSSP Director C. F. Van Thullenar monitors the high-frequency radio equipment used for ground-to-air communications during data-gathering missions.

Norman Prosser (seated) prepares a flight plan for Project aircraft.

Dr. Chester Newton, the Project's Chief Scientist, briefs the crew of an Air Force B-66 in preparation for a mission.

Miami to Oklahoma City at the beginning of the season.

All three of the Bureau's aircraft recorded a considerable amount of data, which is now being analyzed for use in research.

Two special surface networks were used in the 1961 operations. The Alpha network consisted of about 200 stations in southern Kansas, Oklahoma, and the northern half of Texas, spaced at approximately 30-mile intervals. All stations in this network were equipped with 12-hour microbarographs; 155 also had 12-hour hygrothermographs; and 140 had weighing-type recording rain gages. The 36 stations in the Beta network were spaced approximately at 15-mile intervals and arranged in an oblique, six-by-six checkerboard pattern from Oklahoma City southward to the Texas border. All Beta stations were equipped with microbarographs, hygrothermographs, recording rain gages, and wind recording equipment.

Serial rawinsonde observations were made at 13 stations of the Weather Bureau and the Air Weather Service and at the U. S. Army Signal Corps station in Fort Sill, Oklahoma. Typically, soundings to 200 or 150 mb. were made at selected stations at 90-minute intervals during the period 1730 to 2330Z.

Special pibal observations to 10,000 feet were made hourly during five 24-hour periods in late April, late May, and early June at 13 locations along a line from Amarillo, Texas, to Little Rock, Arkansas. The approximately 1600 observations were made to obtain small-scale measurements of the low level jet and other low-level wind features associated with severe storm systems.

Radar facilities of 16 Weather Bureau and 6 Air Defense Command stations were used to gather data for the Project. Scope photographs for selected stations were requested on 13 days during the operational period.

The Research Flight Facility

After three months of severe storm research, the planes of the Weather Bureau's Research Flight Facility have returned to their base at Miami and are now in the middle of their second season of gathering data on hurricanes.

The Research Flight Facility began as part of the National Hurricane Research Project. At the end of 1960, it became a separate organization under the leadership of Carl Reber, and the scope of its activities was broadened.

The planes of the RFF--two DC-6's, one B-57, and one B-26--are now used for meteorological research of all kinds. New research programs presently being planned will keep the Research Flight Facility engaged in atmospheric investigations on a year-round basis.

The establishment of this facility meant the realization of a goal long held by Weather Bureau scientists, who looked forward to the day when the Bureau would have its own specially instrumented aircraft and trained personnel available for weather research.

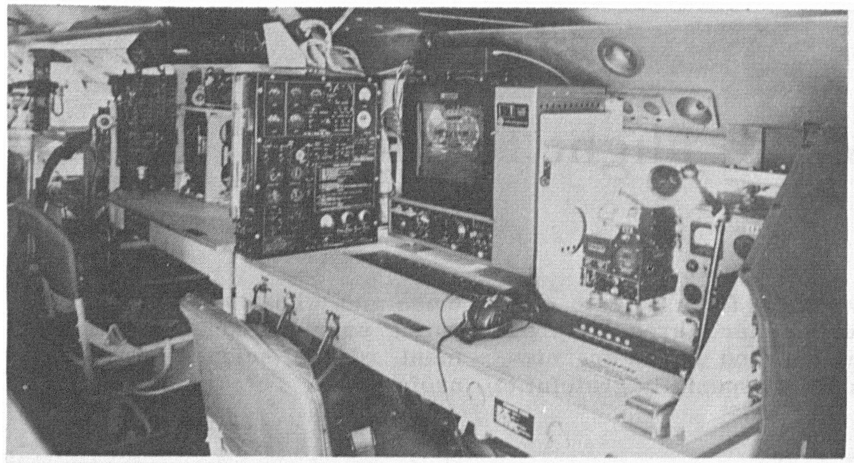
The men of the Research Flight Facility must leave their home base for weeks and months at a time to accomplish their assignments. They work around the clock and over weekends at a job that is , to say the least, more than normally hazardous. Many of them have over 50 hurricane eye penetrations to their credit.

What kind of men are these who choose such an unusual occupation? They are typical Americans, with homes and families. But their collective background shows that they are men who have sought the different or "offbeat" means of livelihood. They have flown or sailed all over the world; they have forecast and analyzed the weather from pole to pole.

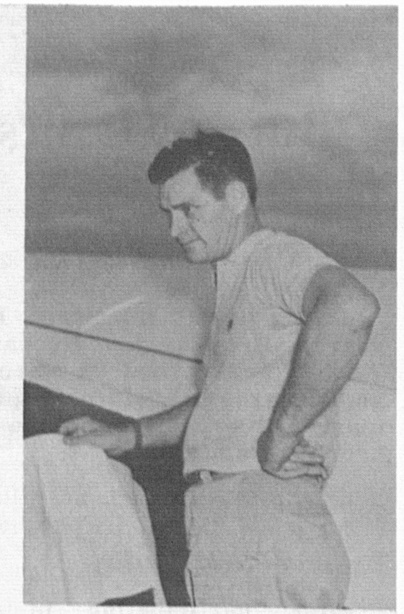
The Weather Bureau is proud of this new and unique organization and is especially grateful to these men whose work is contri*buting so much to the advance*ment of the science of meteorology.

The DC-6 39C team. Left to right: B. T. Patten, Crew Chief; E. W. Noennich, Co-pilot; D. R. George, Co-pilot; W. E. Hunt, Supervising Electronic Technician; D. B. Sittman, Pilot; R. L. Daniels, Electronic Technician; J. W. Taylor, Electronic Technician; H. A. Friedman, Flight Meteorologist; F. E. Christensen, Chief Meteorologist; and D. A. Bush, Electronic Technician. W. R. Fitch, Navigator, is not shown.

THEY FLY FOR THE WEATHER BUREAU



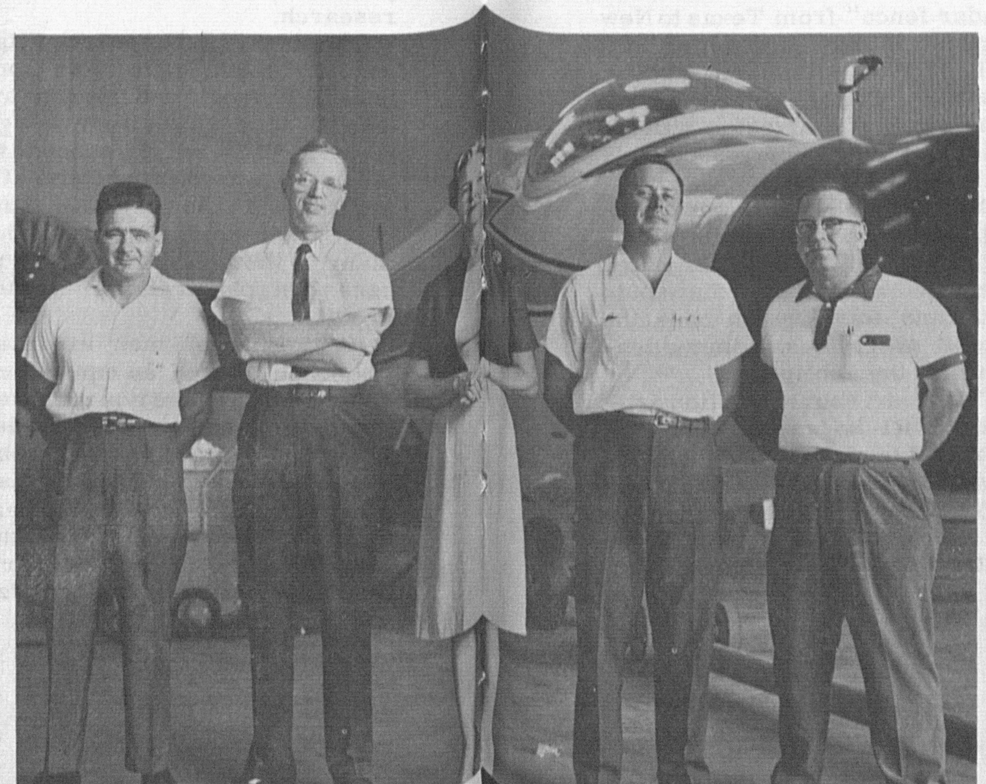
Instrumentation at the flight meteorologist's and navigator's positions in one of the DC-6 research planes.



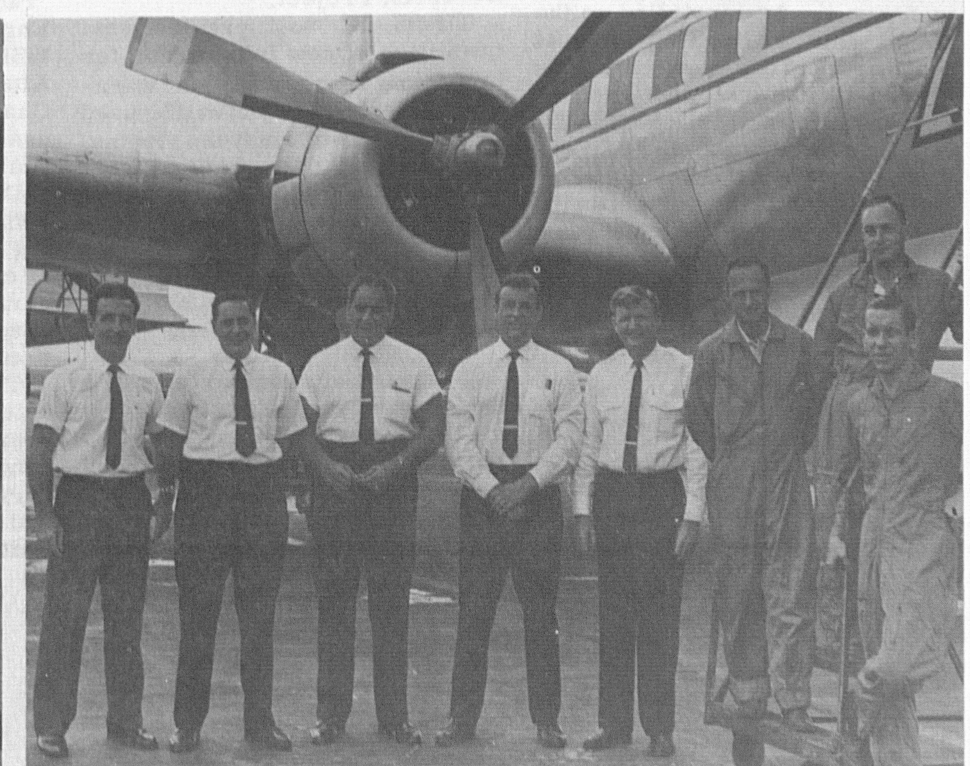
Jim Cook, pilot of the B-26.

B-57 TEAM: (left to right) R.W. Gentry, Electronic Technician; H.J. Gorby, Technician; J. Zubritsky, B-57 Crew Chief; C.M. Reber, Chief of the Research Flight Facility and back-up crew member; A.B. Arnett, Jr., B-57 Flight Meteorologist; and W.E. Cunningham, Manager, Flight Operations and B-57 Pilot.

SUPPORT GROUP: (left to right) J.T. Netterville, Fueling Specialist; H.P. McTeigue, Executive Vice-President, Aircraft Crewing and Maintenance Contractor; Mrs. Edna S. Fortenberry, Secretary; A.C. Grunenfelder, Instrumentation Engineer; and A.E. Brown, Jr., Administrative Officer. Not shown are C.W. Travis, Engineering Technician, and Mary Poppe Palmer, Secretary.



DC-6 (40C) TEAM: (left to right) A. Ricci, Assistant DC-6 Crew Chief; J. Lubin, Navigator; F.S. Cicirelli, Crew Chief; J.J. McCann, Co-pilot; D.H. Mettrick, Pilot; H.W. Davis, Flight Director (Meteorologist); I.W. Richardson, Flight Meteorologist; and H.E. Pohl, Electronic Technician. Not shown are F.L. Darling, Electronic Technician, and S.P. Fazekas, Electronic Technician.



Bureau Units Alert as Hurricane Season Begins

The National Hurricane Research Project, the Research Flight Facility, and the warning service are ready with new equipment and new plans for the '61 hurricane season.

Research Flight Facility

After participating in the National Severe Storms Project, the busy planes of the Weather Bureau's Research Flight Facility returned to their Miami base to prepare for the hurricane season. The Bureau's B-26, formerly used only in severe local storm research, has now become part of the Research Flight Facility and will participate in the hurricane program.

Already, the planes have flown three missions for the National Hurricane Research Project. Data from Anna, the first hurricane of the season, were gathered on flights from Miami, San Juan, and Curacao. Each flight was made by one DC-6.

More meteorological equipment will be installed on the planes this year. Giannini gust probes, to provide a continuous record of lateral and vertical acceleration, will be added to the two DC-6's and the B-26. Vertical scanning radars installed on the DC-6's will supplement on the APS-20 radars and give a complete cross-section of precipitation. Silver iodide dispensers for cloud seeding have also been installed in the DC-6's this year.

National Hurricane Research Project

Sometime during the 1961 hurricane season, the Weather Bureau planes will seed a strategically located convective cell in a hurricane. The seeding operation is intended primarily to test methods and techniques and to determine how efficiently supercooled water can be converted to ice.

In Hurricane Donna, this relatively small cell on the rim of the eye was found to act as a flue for primary release of energy. If the seeding technique proves effective and there is a sufficient amount of liquid water present, it may eventually be possible to alter the pattern of energy release from a hurricane in such a way as to produce asymmetries of circulation in the storm. This could cause the storm to break up into several less severe centers or to alter its course momentarily.

The hurricane-seeding project is supported in part by the National Science Foundation.

This year, the Air Force will make a U-2 available for photographing hurricanes and gathering meteorological data for the Research Project.

TIROS III will provide vast quantities of new information for hurricane research and for warnings. The photographs will be used to locate and to study the storms, and radiation data obtained from the satellite will be used in hurricane research.

Hurricane Warning Service

Our newest weather satellite has already demonstrated its value to the hurricane warning service. Two hurricanes off the west coast of Mexico were observed by the satellite, and fixes on Hurricane Anna were obtained from TIROS III on July 21, 22, and 23. On July 25, after the hurricane had moved inland and broken up, TIROS III photographs showed considerable cloudiness over the Yucatan Peninsula but no sign of cyclonic circulation.

The satellite can be even more useful in locating storms far out in the ocean, away from shipping lanes and observing stations. Such storms often go undetected by ships or aircraft for several days.

Air Force weather reconnaissance planes will continue to operate from Kindley Air Force Base in Bermuda. Navy hurricane hunters of Airborne Early Warning Squadron 4 have their main base in Puerto Rico, but two planes are stationed in Jacksonville to patrol the Gulf of Mexico. Aircraft of the Research Flight Facility will provide forecasters with information on the location, intensity, size, and course of hurricanes obtained on research flights.

With the addition of five new weather surveillance radars, the "radar fence" from Texas to New England is now complete. New WSR-57's at New York City, Altantic City, Tampa, Lake Charles, and Galveston will be used to track hurricanes this year.

During the 1961 hurricane season, every coastal public warning office will have a designated alternate station to distribute hurricane warnings in case the coastal office loses communication with the public.

This year, hourly position estimates will be issued from the responsible hurricane warning center whenever a storm is under surveillance by land-based radar and is within 200 miles of the United States coast.

$10,000,000 Increase

Congress Passes Bureau Appropriation Bill

On August 3, 1961, the President signed P. L. 87-125 making appropriations for the Executive Office of the President, the Department of Commerce, and Sundry Agencies for the fiscal year ending June 30, 1962. Included in the bill is $70,500,000 for the Weather Bureau.

Weather Bureau funds for FY 1962 are divided among three appropriations. The following discussion will treat each of these separately.

For Salaries and Expenses, commonly referred to as the operations budget, the President requested $55,615,000. In approving $56,250,000, the Congress added several projects totaling $1,233,000. As the appropriation is only $635,000 higher than the President's request, it will be necessary to implement some new programs at a slightly lower level than planned.

Increases over last year's $48,800,900 appropriation are programed as follows:

Helium cost increase..$446,000
Bureau of Mines helium plants are being expanded, and customers will be charged 2 and 2/3 times the previous rate for helium.

Operational use of data from meteorological satellites...........................$1,000,000
Provides for Weather Bureau staff at the readout stations and at the National Meteorological Center, increased communications cost, and photographic, recording, and facsimile equipment.

JNWP transfer from Department of Defense to Weather Bureau........................$936,000
Since its beginning the JNWP Unit of NMC has been financed jointly by the Weather Bureau, the Air Force, and the Navy. Beginning July 1, 1961, funds were deleted from Department of Defense budget and added to the Weather Bureau budget to maintain the current level of JNWP operations.

Operation and maintenance of new equipment..........$1,735,800
The President had requested $1,799,800 for this purpose, but a reduction of $64,000 will be required to fit programs to available funds.

This item will support 45 additional electronic maintenance technicians in the states and territories, 5 construction and maintenance representatives at the Regional Administrative Offices, and 2 electronic technicians in the Arctic costing $378,400.

Included is $325,000 for specialized test equipment for WSR-57 radars and certain plug-in sub-assemblies for the radars.

Higher cost of expendable rawinsondes for use with the transponder-modified WBRT-57's at 30 stations will require $582,400. Other supply items such as tubes, lamps, etc., increased cost of electricity and communications required to operate the newly installed radars, radiotheodolites, RVR computers, EOR installations, etc., will receive $450,000 of new funds.

Moving ship raobs.....$400,000
Five additional shipboard raob programs will be started in FY 1962. The request was for $500,000 with reduction necessary to fit final congressional action.

New upper-air stations...$180,000
Two-a-day rawinsonde programs will be started at Winslow, Arizona, and Huntington, West Virginia, in November. The city office at Huntington will be closed, and a 24-hour-a-day Weather Bureau Airport Station commissioned at Huntington in September.

Aviation weather services......................................$817,900
A Flight Assistance Service Quality Control Program will be started with $280,000 of new funds. Use of hypsometers and higher sounding balloons to give more accurate upper-air data at 30 stations will require $324,900. Transfer of the meteorological observing program at Kahului from FAA to the Weather Bureau and the establishment of seven second-order stations following FAA withdrawals were approved, costing $168,000. The second-order locations are Gila Bend, Arizona; Du Bois, Idaho; La Junta, Colorado; Battle Mountain, Nevada; Bryce Canyon, Utah; Drummond, Montana; and Fort Yukon, Alaska.

Improved communications--three new station connections to the high-altitude facsimile circuit and ten new PATWAS installations -- were approved, costing $45,000.

Commissioning of the new Dulles Airport has been delayed till the fall of 1962. Our $157,000 item for the new Weather Bureau Airport station was deleted for this reason.

New River Forecast Center.................................$150,000
The new River Forecast Center will be set up at Fort Worth, serving the West Gulf and Rio Grande drainage areas.

Additional climatological services.......................$150,000
Provides for a State Climatologist in the State of New York; additional processing of meteorological satellite data and extension of the work started in FY

1961 on the decennial census of climatology were approved.

Executive direction and administration..................$295,300
The higher level of work programs in FY 1962 makes it necessary to provide minimum staff increases in direction of Bureau programs and in supporting administrative work.

Conversion to metric units. The plan to convert outgoing international weather messages to metric units will be deferred for this year.

General purpose space.$50,000
Although $115,000 was requested for the rental of additional space to house badly overcrowded offices, only a start in this direction will be possible this year.

New Programs Added by the Congress

In addition to the above programs requested by the President, the Congress earmarked additional funds to support the following:

Specialized Mississippi Delta-type agricultural weather services...................... $758,000
Establishment of agricultural weather service projects in the following specific states were earmarked by the Congress: delta areas of Arkansas, Missouri, Tennessee; southwest Georgia; southeast Alabama; northwest Florida; lower Rio Grande Valley of Texas; western lower Michigan; New Jersey, south central Pennsylvania; western and central Maryland; northern Virginia; northeastern West Virginia; Oregon; and southern Idaho.

Strengthened fire weather forecasting............... $200,000
Provides for adding fire weather forecasters at 12 specific offices in western states and Alaska.

Specific field offices..$275,000
Concordia, Kansas - to establish 24-hour Weather Bureau Airport Station with WSR-3 radar.

Elkins, West Virginia - to reestablish 24-hour Weather Bureau Airport Station.

Flagstaff, Arizona - to extend operations to full 24-hours a day.

Hanksville, Utah - to install AMOS and provide briefing services during part of the day behind FAA remoting.

For the Research and Development appropriation, the Congress approved $9,000,000. The initial request by President Eisenhower was for $9,000,000. Following review by President Kennedy, this was raised to $9,500,000 to include an additional $300,000 for meteorological oceanography; $100,000 for hydrologic research, and $100,000 for climatic research into water resource problems. These increases were not approved.

The Research and Development appropriation for FY 1961 was $6,446,500. The additional funds for FY 1962 will permit increases as follows:

Meteorological Satellite Laboratory...................$2,200,000
Funding of $1,172,200 in FY 1961 was provided by NASA as a reimbursement to the Weather Bureau. Congress approved transfer of funding support to the Weather Bureau and okayed the requested increase of $1,027,800.

General Circulation Research. $274,000
The increase will be used to build up computing and research staff prior to installation of a new ultra-high-speed computer late in the fiscal year. Rental costs for the new computer for several months are also included.

Other Research and Development programs--such as hurricane, tornado, aviation, hydrologic, and climatic--were approved at existing levels.

The President's request that Weather Bureau Research and Development funds be available for obligation over a three-year period (similar to existing authority for Establishment of Meteorological Facilities funds) was approved by the Congress.

For the Establishment of Meteorological Facilities appropriation, projects totaling $5,250,000 were approved. This is the full amount of the President's request and provides the same level of new projects as the previous year.

Included in this appropriation are:

Upper-air...............$230,000
Relocation of one upper-air station and procurement of additional equipment for raob programs aboard eight moving ships.

Radar.....................$486,000
Relocation of WSR-57 from Columbia, Missouri, to Catalina Island, California; modernization of San Juan, Hatteras, and Nantucket SP1M radars; and two microwave radar links.

Surface............... $3,385,700
EOR and RVR equipment for 51 additional runways; 60 hygrothermometers; 50 wind recorders; 10 AMOS; 2 MAMOS; equipment for 265 basic climatic substations; modernization of 100 rotating beam ceilometers; and 172 new river and rainfall gages of several types.

Construction - remote localities....................... $276,000
Two housing units and relocation of the office and inflation shelter at Nome, Alaska.

Relocation of office and inflation shelter at Kotzebue, Alaska.

Inflation shelter at Lihue and construction of office and inflation shelter at Wake Island.

Engineering and technical support........................ $872,300
Twenty positions were approved for the engineering and technical support of EMF programs to prepare specifications, make engineering site surveys, test production models, and monitor equipment deliveries.

New Student Trainees

Fred A. Beeler
Fort Smith, Ark.
Colin L. Campbell,
San Diego
Anthony P. Chrisanthis,
Charleston, S. C.
Dean R. Del Arpporte,
Minneapolis
Kevin D. K. Fang,
Honolulu
Robert D. Grebe,
Los Angeles
David D. Halvey,
Albany
Wilbur M. Ham, Jr.,
Norfolk
John W. Hathorn, III,
Port Arthur
Robert M. Holley, Jr.,
Boston
Neill E. Jones,
Oklahoma City
Lawrence G. Katz,
New York
Courtney R. Lantz,
Great Falls
Robert Y. G. Lee,
Honolulu
Henry L. Leopold,
Harrisburg
Gerald J. McCarthy,
Boston
Val L. Mitchell,
Salt Lake City
Russell W. Moyer,
Harrisburg
Richard N. Newsome, Jr.,
Asheville
Frank S. Nishimoto,
Seattle
Douglas A. Paine,
Cleveland
Franklin G. Poston,
El Paso
Richard P. Rishel,
Wichita
Ronald L. Selvey,
Cincinnati
James F. Shunk,
Chicago
David B. Smith,
Philadelphia
Martha D. Snyder,
Detroit
Robert C. Surabian,
Hartford
Charles H. Swan,
Green Bay
Edwin T. Tanouye,
Honolulu
Richard Taranto,
Newark

19 Weather Bureau Employees Given University Assignments

Nineteen Weather Bureau employees will have full-time university assignments during the coming academic year. The employees, their previous duty stations, and the universities they will attend are as follows:

Norman J. Asbridge, WBO, Pt. Arguello, U. C. L. A.
James M. Beall, Central Office, Harvard Graduate School of Business Administration
David L. Bjorem, WBAS, Portland, University of Washington
Frank W. Burnett, Central Office, Massachusetts Institute of Technology
Grayson V. Cordell, WBAS, Great Falls, University of Washington
George W. Cry, Central Office, Colorado State University
Allen D. Cummings, WBAS, Waco, Texas A & M
Gabriel Diaz, WBAS, San Juan, Florida State University
Earl W. Estelle, Central Office, George Washington University
Harry R. Glahn, Central Office, Pennsylvania State University
Joseph F. Harrison, WBO, New York City, New York University
Harry F. Hawkins, NHRP, Miami, Florida State University
Robert Y. Hirano, WBAS, Chicago, University of Chicago
William H. Klein, Central Office, New York University
Jean T. Lee, NSSP, Oklahoma City, University of Chicago
Edmund J. Manning, WBAS, Honolulu, University of Hawaii
Richard B. Neave, WBAS, Minneapolis, University of Utah
Nathan W. Stiewig, Central Office, George Washington University
Hazel Tatro, WBAS, Wilmington, N. C., Florida State University

Deaths

James P. Molen

James P. Molen, Meteorologist in Charge at the Weather Bureau Airport Station in Greensboro, North Carolina, died on July 3. Mr. Molen attended Burleson College and Baylor University in Texas, and served in the U. S. Army's Mexican border service in 1916 and 1917. After two years with the Post Office, he entered the Weather Bureau in 1919 and served for nine years at the Groesbeck, Texas, aerological station. In 1928, he moved to Greensboro as MIC. Mr. Molen is survived by his wife, Helen M., of 206 Hermitage Road, Greensboro, and two sons, three daughters, and 12 grandchildren.

George E. Grimes

George E. Grimes, a retired Weather Bureau employee, died April 19 at the age of 93. Mr. Grimes entered the weather service in 1887, when it was still part of the Signal Corps. He was stationed at Washington, D. C., Buffalo, N. Y., and Nantucket, Massachusetts. He retired in 1938, after 51 years of service. Following his retirement, Mr. Grimes was elected assessor for Nantucket and was later re-elected for ten additional two year terms. His last victory came in November 1960, just before his 93rd birthday.

Meteorological Readings

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate. For more introductory information, see TOPICS May 1957.

Assignment L: Five questions are based on "Tornadoes of Jan. 21, 1959-A Feature of Weather Singularity?" Monthly Weather Review, Volume 87, No.1, January 1959, pp. 40-42, and five are based on "A Sequence of Tornado Damage Patterns," Monthly Weather Review, Volume 87, Number 6, June 1959, pp. 207-216.

QUESTIONNAIRE

Col. 61 Which of the following is most indicative of the January 20-22 singularity at Nashville?
1. A pronounced peak in precipitation
2. Below normal pressure
3. A peak in the mean temperature on January 21
4. Strong WSW winds

Col. 62 Consideration of mean 500-mb charts for January 20 and January 27 shows:
1. The wind maximum at 500 mb associated with the 18,400 foot contour
2. Greater amplitude to the southern portion of the trough centered directly over Tennessee
3. Winds over the southern portion of the country more westerly than normal
4. None of the above

Col. 63 Certain severe storm-favoring conditions are found to prevail in the Tennessee area around the time of the singularity, one of these is:
1. Warm, dry surface air
2. A 500-mb trough centered over the Tennessee area
3. A high level jet stream
4. Pronounced backing of the wind with height

Col. 64 Which of the following is not appropriate in connection with a suggested worldwide pattern of January singularities:
1. freezing nuclei counts at Washington, D. C.
2. Bowen's worldwide rainfall data
3. Hemispheric fluctuations in meridional exchange of air at 50°N latitude
4. Low level cloud data at Australian stations

Col. 65 A consideration of tornado distribution for five states for the period 1931-1959 reveals:
1. 21 tornado days during the month of January
2. 6% of tornadoes occurred in association with the discussed singularity
3. More than twice as many tornadoes on January 22 as on any other January day
4. The primary tornado day peak occurs on January 29-31

Col. 66 Three idealized flow models of wind pattern around tornado funnel were constructed. Of these:
1. Only one, model c, can account for all types of damage patterns
2. Model b seems consistent with the herringbone type of damage
3. Model a most closely approximates the three-way combination flow of rotation, translation and inflow
4. All three can account for the different types of damage patterns provided inflow speeds greatly exceeded the translational speeds

Col. 67 The widening of the damage pattern between miles 19 and 20 (fig. 6) may be explained according to the authors by the fact that: (one or more correct answers)
1. The diameter of the funnel increased temporarily
2. The storm turned south, then east again
3. The original funnel dissolved as another formed to the south
4. The terrain roughness increased

Col. 68 A fan-shaped damage pattern suggests it was produced:
1. By a wind field made up of a downdraft and translation
2. By a "tilted" tornado
3. By a wind field made up of a vortex plus translation
4. By a tornado in its initial stages

Col. 69 Underline the correct statements
1. According to the author the "reverse" flow in a tornado does more damage because it is usually on the northern side
2. Alterations in damage pattern as the storm progresses could be explained by an unsteady storm structure
3. A strongly circular damage pattern is more apt to occur with fast moving tornadoes
4. The tornado studied in this article was only one of a system of five related tornadoes

Col. 70 The photographs and analyses indicate that over the first few miles of the tornado's path the damage was more complete over the southern half. This is explained by the fact that:
1. The tornado's path was very erratic
2. It moved from west to east
3. The translational speed of the tornado was added to the rotation over the southern portion
4. None of the above is correct

RETIREMENTS

Louis Landau

Louis Landau, an Aviation Forecaster at New York International Airport, retired on July 3. After working in private industry, Mr. Landau came to the Weather Bureau in 1928. All of his service has been at stations in the New York area. He has attended New York University and the College of the City of New York. Mr. Landau's address is 1990 78th Street, East Elmhurst 70, New York.

William R. Thickstun

William R. Thickstun, who has been chief of the Instrumental

Engineering Division since 1941, retired on July 22 after 43 years of Weather Bureau service. Mr. Thickstun entered the Bureau in 1918 as an Engineering Draftsman in the Central Office Drafting Room. He served as Chief of the Drafting Room from 1922 until 1937, when he transferred to the Instrumental Engineering Division. Mr. Thickstun has a law degree from Georgetown University and is a member of the District of Columbia Bar Association. He also attended George Washington University. His address is 7803 Marbury Road, Bethesda 14, Maryland.

Edward C. Corkill

Edward C. Corkill, a meteorologist at the Kansas City Weather Bureau Office, retired on July 31. Mr. Corkill attended Washburn University and entered the Weather Bureau as a junior observer at Topeka, Kansas, in 1926. He was transferred to Bismarck, North Dakota, for a few years and was then made Meteorologist in Charge at Concordia, Kansas, a position he held for ten years. Since 1940, he has served at Kansas City in the Hydrologic Unit, the Weather Records Processing Center, the Weather Bureau Airport Station, and the Weather Bureau Office. Mr. Corkill's address is 648 North 57th Street, Kansas City 2, Kansas.

Samuel C. Byrd

Samuel C. Byrd, Warehouseman at the National Weather Records Center in Asheville, retired on July 7. After working for the Post Office, the Veterans Administration, and the General Services Administration, Mr. Byrd transferred to the NWRC in 1954. His address is 16 Charles Street, Asheville,North Carolina.

Commerce Photography Contest Open to All Bureau Employees

The Department of Commerce Welfare and Recreation Council is sponsoring a photography contest, open to all Commerce employees in Washington and in the field. The Weather Bureau's representative for the Contest is Albert Carlin, Chief of the Central Office Training Section.

Deadline: All entries should be submitted to your bureau representative, Albert Carlin, by November 17, 1961. The photographs will be exhibited in the Main Commerce Lobby from November 27 to December 1.

Size of Photographs: 8" x 10" or larger (Polaroid photographs only may be 5" x 7"). All photographs must be mounted on plain white or gray cardboard.

Quality of Photographs: Black and white prints and colored photographs toned or produced by any of the recognized processes. Hand-tinted prints are not acceptable. All pictures must be photographed by the entrant who must be employee of the Department of Commerce. Pictures should have been taken within the past five years.

Categories and Prizes: Eight sets of 1st, 2nd, and 3rd prize ribbons for black and white and eight for color photographs will be awarded in the four categories of the contest--action, landscapes, portrait, and still life. Two trophies for best photograph in the show will be given--one award to be selected by the judges, the other by a vote of the viewers.

Identification of Pictures: The backs of all pictures should contain the name, bureau, building, and room number of their photographers. The category in which the picture is to be entered should also be listed.

Number of Pictures Per Contestant: There should be a maximum of four entries for black and white and four entries for color in each category per contestant.

Policy Statement: The contest is open to all appropriate subject matter. However, the Department of Commerce Welfare and Recreation Council reserves the right to reject any photograph it considers not in good taste.

All possible care of the photographs will be taken by the Council in sponsoring this contest. However, each entrant exhibits at his own risk, and the Council and the Department of Commerce assume no responsibility for damage or loss.

All entries should be wrapped securely and should include return postage.

Suggestion Award Winners

Donald A. Semancik	WBAS, Indianapolis	$100
Thomas E. Aubin	WBAS, San Diego	50
Clara M. Davall	NWRC, Asheville	25
Anthony Sultana	NWRC, Asheville	25
John A. Reilly	WBAS, Portland, Ore.	25
Wilbur W. Wray	WBAS, St. Joseph	25
Raymond G. Strietzel	WBAS, Denver	20
Lester L. Allen	WBAS, Bismarck	15
Nick Bardoulas	WBAS, Rockford, Ill.	15
James C. Fidler	F&SR, CO	15
Joseph E. Galaziewski	WBAS, Topeka	15
Anthony Sultana	NWRC, Asheville	15
Robert C. Carpenter	WBAS, Greenville, S.C.	10
Mary E. Murphy	RAO, Kansas City	10
Lawrence O. Oliver	WBAS, Great Falls, Mont.	10
Paul J. Rhodes	WBAS, Greenville, S. C.	10

Welcome to the Weather Bureau

William F. Agresto, Electronics Maintenance Technician, Providence
John Carl Alishouse, Physicist, Central Office
William M. Ahl, Jr., Meteorologist, San Francisco
Richard W. Asper, Meteorologist, Salt Lake City
Raymond Battey, Meteorological Technician, Glasgow
Eldon M. Beals, Meteorological Technician, San Francisco
Ogechee Luvenia Carter, Clerk-Typist, Central Office
Dorris Caldwell Daniel, Jr., Personnel Management Assistant, Central Office
Sibyl R. Ehredt, Meteorological Technician, Kotzebue, Alaska
Bernard Fridovich, Physicist, Central Office
Edward J. Geer, Meteorological Technician, Ely, Nevada
Carlos P. Gradillas, Meteorological Technician, Anchorage
Larry M. Heinlein, Electronics Maintenance Technician, Cleveland
Walter C. Henson, Meteorologist, Reno
Catherine J. Hiland, Mathematician, Central Office
Albert R. Hinn, Meteorologist, New York
Richard Royal Hoopes, Meteorologist, Shannon, Ireland
Chester P. Jelesnianski, Meteorologist, Central Office
Juanita J. Johnson, Meteorological Technician, San Franciso
Roy A. Kabasta, Electronics Maintenance Technician, Cape Hatteras
Ruth K. Kassing, Time, Leave and Payroll Clerk, Salt Lake City
Robert J. Koke, Engineer, Kansas City
Arnold H. Kuck, Electronics Maintenance Technician, Fort Wayne
Richard L. Lowery , Meteorological Technician, Cincinnati
John D. Maloney, Time, Leave and Payroll Supervisor, Kansas City
Jessica Irene Martin, Secretary, Central Office
Ronald H. Martin, Illustrator, Central Office
Betty Caroline Mengel, Meteorological Technician, Central Office
James A. Miles, Electronics Maintenance Technician, Oklahoma City
Richard E. Moll, Budget Analyst, Central Office
Caroline Sue Miller, Clerk-Typist, Central Office
Conrad P. Mook, Meteorologist, Washington, D. C.
Raymond O. Munn, Meteorological Technician, Washington, D. C.
Vernon Ray Nebergall, Meteorologist, San Juan
Donald H. Northrop, Meteorologist, Helena
Betty J. Owens, Clerk-Stenographer, Salt Lake City
Richard Clayton Peck, Electronic Technician, Sterling, Va.
M. Thelma Pendergrass, Card Punch Operator, Chattanooga
George M. Phillips, Instrument Maker, Central Office
Monte F. Poindexter, Meteorological Technician, Central Office
Jackson D. Putney, Meteorological Technician, Flint, Michigan
William Y. Ramsay, Physicist, Central Office
Herbert M. Roseman, Meteorologist, Kansas City
Charles V. Ross, Electronics Maintenance Technician, Worcester
Richard Sasan, Meteorological Technician, Honolulu
Ronald A. Schrock, Electronic Engineer, Central Office
James T. Schulz, Meteorological Technician, Washington, D. C.
Nelson M. Seese, Electronic Engineer, Central Office
Sam I. Serkin, Meteorologist, Washington, D. C.
Edward L. Speidel, Meteorological Technician, Tatoosh Island
Bob Stark, Meteorological Technician, Las Vegas
Nellie G. Stephenson, Clerk-Typist, Chattanooga
Wallace W. Thurston, Meteorologist, Kansas City
Donald A. Whelpley, Meteorological Technician, Charleston, S. C.
Lorimer E. Whitehead, Jr., Meteorological Technician, Central Office
Grady Edward Whitney, Physicist, Central Office
Warren M. Wisner, Meteorologist, Grand Rapids
John Arthur Young, Physicist, Central Office

Length of Service Awards

35-Year Awards

Darathea H. Cartwright, Climat., Central Office
Ralph Sanders, WBO, New Orleans

25-Year Awards

William E. Acord, WBAS, Medford, Ore.
William J. Ashcraft, WBAS, Midland
John W. Fuller, Jr., WBAS, San Diego
Marion M. Moses, Adm. Ops, Central Office
Arthur J. Myers, WBAS, Sault Ste. Marie
Alfred B. Nelson, WBAS, Red Bluff
Murl V. Renneke, WBAS, Minneapolis
Palmer W. Reynolds, WBAS, Amarillo
William J. Rogers, WBO, Pomona
Donald T. Rowland, WBAS, Port Arthur
Louis J. Solheim, WBAS, Sioux City
Morris Steinberg, WBO, Denver
Edmond F. Striker, WBAS, South Bend
John K. Temperley, WBAS, Allentown
Raymond A. Wilson, WBAS, Fargo, N. Dak.

15-Year Awards

Georgia B. Bassett, WBAS, Lansing
Lorelei H. Dame, IED, Central Office
James H. Dew, Jr., AWP, Boston
Ronald R. Drumm, WBAS, Flint
Max R. Griffith, WBAS, Wichita
Donald D. Howard, WBAS, Denver
Farrell B. Johnson, WBAS, Huron, S. Dak.
James A. Kuhn, WBAS, Topeka
Stanley J. Lacy, WBAS, Medford, Ore.

Civil Service Commission Increases Cash Awards For Suggestions

The Civil Service Commission has instituted several changes in the Government-wide operation of the Incentive Awards Program. The changes, which became effective July 1, are designed to make the program more valuable from the standpoint of both employees and management.

To be eligible for a cash award, a suggestion must now result in measurable benefits of at least $50, or, if a suggestion produces non-measurable benefits, its value must be judged as comparing favorably with one producing at least $50 worth of measurable benefits.

The minimum cash award for suggestions that meet this standard is $15. The previous minimum award was $10. Appropriate non-financial recognition will be given for suggestions which do not meet the standard for a cash award.

Under a new awards scale, suggestions which produce significant measurable benefits will bring larger cash awards than before. Here are some examples of how awards are increased under the new scale:

Measurable Benefits	Award New	Award Old
$2,000	$100	$75
$4,000	$200	$125
$8,000	$400	$225
$10,000	$500	$275

Luther B. McDonald,
RAO, Fort Worth
James T. Rodewald,
WBAS, Lubbock
Morton J. Rubin,
OMR, Central Office
Margaret A. Rutherford,
RAO, Kansas City
Vincent S. Sacco,
WBO, Pittsburgh

Transfers

	From	To
Dorus D. Alderman	Mobile	Key West
Elford G. Astling	Salt Lake City	Central Office
Richard S. Baker	Kansas City	Grand Cayman
Albert O. Bangert	San Juan	Omaha
Stephen Berman	Cleveland	New York
Jack R. Bird	Albuquerque	Missoula
David W. Cain	Tatoosh Island	Spokane
Adam H. Cardenas	Fort Huachuca	Midland
Thomas A. Carey	Sacramento	Salt Lake City
Henry W. Chidley	Battle Creek	Denver
David W. Cooke	Cincinnati	Phoenix
Billy R. Curry	Fort Worth	Wichita Falls
Allen B. Dascomb	Glasgow, Mont.	Los Angeles
Roger D. Dickey	Bakersfield	Sacramento
Otho Mitchell Eakin	Detroit	Washington, D. C.
Donald L. Finch	Albuquerque	Tulsa
Tillman F. Gladney	Miami	Washington, D. C.
Charles D. Gouldie	Galveston	Austin
John W. Hambleton	Fairbanks	Nantucket
Charles A. Hauck, Jr.	Knoxville	Kansas City
Donald G. Hipperson	Portland, Ore.	Fort Huachuca
Frank C. Hood	Asheville	Baton Rouge
Robert L. Hordichok	San Francisco	Seattle
John C. Johnson	Barter Island	Nome
Thomas L. Kirkpatrick	Knoxville	Galveston
Garland F. Kopp III	St. Cloud	Dodge City
Lawrence H. Landweber	Miami	Los Angeles
Paul C. Leshko	Pittsburgh	Huntington, W. Va.
Robert Levine	San Juan	Miami
John A. Llewellyn	Annette Island	Medford, Ore.
James E. Lovill	Bristol, Tenn.	Greensboro, N. C.
Roger P. Mallory, Jr.	Baton Rouge	Antarctica
Harvey H. Matzner	Chicago	Burbank
Hubert McCaleb	San Juan	New Orleans
Thomas E. McCaughan	Key West	Miami
David L. McLaughlin	Austin	Abiline
Miles E. McSweeney	Tampa	Key West
Robert L. Murray	Spokane	Missoula
Lawrence E. Niemeyer	San Francisco	Cincinnati
Frank W. Pierce, Jr.	Athens, Ga.	Jacksonville
Charles N. Schauss	Tallahassee	Central Office
William Paul Schultz	Chicago	Battle Creek
Lawrence G. Shaffer	Seattle	Kansas City
Robert S. Shearston	Miami	Jacksonville
Edwin R. Shelton, Jr.	Kwajalein	Hilo, Hawaii
Melvin L. Shifflet	Nome	Anchorage
Clyde L. Slay	Jackson, Miss.	Fort Worth
Leander M. Small	West Palm Beach	Miami
Harrison W. Spencer, Jr.	Montgomery, Ala.	Corpus Christi
Glenn Stallard	St. Louis	Philadelphia
James R. Taylor	Muskegon, Mich.	Louisville, Ky.
Wilford E. Taylor	St. Louis	Springfield, Mo.
Jack L. Teague	San Antonio	Cincinnati
Sanford B. VanLeuwen	Boise	Seattle
Arthur Wachtenheim	Buffalo	Los Angeles
J. William Wantz	Portland, Ore.	Seattle
Robert A. Watanabe	Wake Island	Central Office
Alan I. Weinstein	Providence	Cleveland
Victor Wiggert	Madison, Wis.	Miami

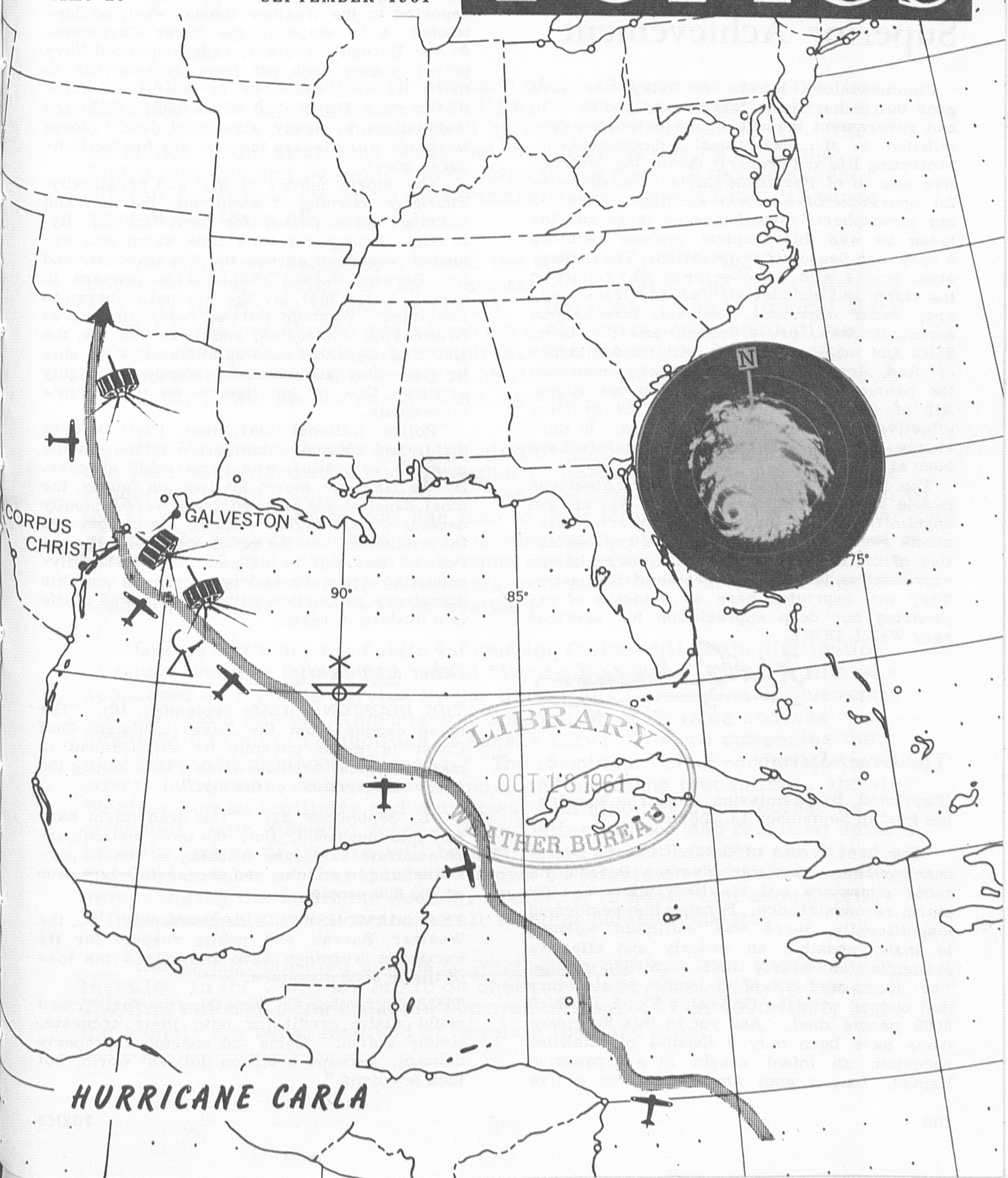
CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

U.S. Weather Bureau

U. S. DEPARTMENT OF COMMERCE
WEATHER BUREAU
Volume 20 SEPTEMBER 1961

TOPICS



HURRICANE CARLA

Editorial

Superior Achievement

Commendatory letters or telegrams have gone out to hurricane forecasters and to civic and government leaders whose activities contributed to the exceptional achievements in protecting life and property during the destructive course of Hurricane Carla. The successful operation of a storm warning system for any atmospheric disturbance as large and intense as was this tropical cyclone requires a very high degree of cooperation. The cooperation begins with the observers who report on the storm and includes aircraft hurricane hunters, radar operators, analysts, forecasters, communicators, press, radio, and TV staffs. State and local authorities, with the assistance of Red Cross crews and others, complete the protective and reconstruction operations. All of these are essential to the greatest effectiveness of the warning system. In Hurricane Carla all participants appear to have been at their best.

The appreciation and gratitude of the American people has been expressed with a warmth and unanimity seldom shown. The editorial comments reproduced on this page are representative of the congratulations and commendations expressed on behalf of the people of the country. They are reprinted here as a means of expressing our deep appreciation for services very WELL DONE.

F. W. Reichelderfer

'The Great Storm'

(Reprinted, by permission, from The Washington Post of September 13, 1961.)

"The first heroes of the Gulf Coast's hurricane disaster were the Weather Bureau, its radar operators and the Navy pilots who fly storm reconnaissance. Because they performed magnificently, there was sufficient warning to make possible an orderly and effective evacuation of nearly half a million people. The storm was one of the worst of a century that opened with the Galveston Flood, in which 6000 people died. And yet in this hurricane there have been only a handful of fatalities reported; an infant caught in a tornado at Kaplan, La., a man who stepped on a live power cable in Houston, half a dozen people trapped by another tornado in Galveston.

"The Weather Bureau warnings over the 10-day life of the storm piled up in a dramatic sequence. Hurricane Carla was first reported to the Weather Bureau early on September 4 by ships in the lower Caribbean. At the Bureau's request, radar-equipped Navy patrol planes took off from Jacksonville to mark its progress hour by hour. An automatic station anchored in the Gulf of Mexico transmitted a steady stream of data. Storm warnings were issued the next day for the Honduras coast.

"The storm moved slowly and erratically. Thursday morning it swept into the Gulf and warnings were posted for west Florida. By 10 a.m. Friday the hurricane watch was extended westward across the Texas coast, and the Bureau warned residents to prepare to move. Later that day the evacuation began in Louisiana. Weather Bureau radar stations at Brownsville, Galveston, and Lake Charles, the end of a chain that runs up to Maine, were able to give civil authorities a steady and highly accurate flow of intelligence on the storm's movements.

"Police, National Guardsmen, Civil Defense units, and citizen volunteers carried out the massive relocation with remarkable success. By the time the storm hit land on Sunday, the most dangerously exposed towns were virtually deserted. On higher ground, discomfort and inconvenience was the refugee's lot, as always. But he was not in danger. For a heavily-populated coast to undergo a storm on this disastrous proportion with so low a loss of life is a modern miracle."

Other Comments

THE HOUSTON PRESS, September 12: "The mass exodus from the Texas-Louisiana Gulf Coast is made possible by advancement in meteorological science which ranks among the great achievements of the age."

LIFE, September 22: "The dead might have run into thousands. But...the most meticulously accurate hurricane tracking on record permitted ample warning and successful evacuation of 300,000 people..."

THE MIAMI HERALD, September 12: "...the Weather Bureau and public respect for its hurricane warnings have minimized the loss of life in such disasters."

TIME, September 22: "One thing the weathermen could claim credit for now: their accurate, timely alarm. Carla did enormous property damage, perhaps a billion dollars' worth, but took few lives."

Topigrams

Washington, D.C.
September, 1961

Esther, the fifth Atlantic hurricane of the 1961 season, was the first hurricane ever discovered by a satellite. A suspicious cloud area, near 11° N., 30° W., was photographed by TIROS III on September 10. The existence of the storm was confirmed the following day by additional TIROS pictures and by reports from ships in the area. A reconnaissance aircraft penetrated the storm on September 12 and reported that its winds were of hurricane strength.

As Hurricane Esther approached the shores of the United States, it appeared to be heading for Cape Hatteras. Fortunately the storm recurved and only its fringes brushed the coast. After diminishing to tropical storm intensity, Esther slowed and performed a clockwise loop, south of Nantucket, that took five days to complete. The storm then headed north-northeastward toward the Canadian Maritime Provinces. Damage was comparatively light, and no deaths were reported.

The Weather Bureau's research aircraft flew into Hurricane Esther from San Juan on September 16 and 17, gathering data for the National Hurricane Research Project. On September 18, the B-57 and one DC-6 again penetrated the storm while en route from San Juan to their Miami base. On September 16 and 17, when the hurricane was moving rather steadily west-northwest at a speed of 12 to 15 mph. with maximum winds over 100 mph., two preliminary experiments and small-scale tests were made of the effects of cloud seeding. Results are now being evaluated.

During October, the Public Information Office will begin distribution of a new Weather Bureau film called "Winds That Kill." The new film was sponsored as a public service by the United Gas Corporation of Shreveport and the Texas Eastern Transmission Corporation of Houston and was produced by Calvin Productions of Kansas City, the same companies that sponsored and produced "Tornado." The 15-minute, black-and-white movie covers hurricanes, hurricane warnings, and hurricane precautions, showing Weather Bureau facilities and activities, and also has some footage on tornadoes, with dramatic scenes of the Dallas tornado and resulting damage. Initially, prints of the film will be distributed to stations near the Atlantic and Gulf coasts, so that it may be shown on television and before community groups during the hurricane season. Later, it is hoped that enough prints will be available to accommodate all Weather Bureau requests.

The atomic-powered automatic weather station has been successfully installed in the Canadian Arctic on Sherwood Head, Axel Heiberg Island. The first automatic transmission occurred on August 17 at 1500 GMT, and the signals are being received at Resolute loud and clear.

Briefs from the CO Staff Conferences

The Department of Defense and the National Aeronautics and Space Administration have proposed that the Weather Bureau be given responsibility for administration of a National Operational Meteorological Rocketsonde Network. A transitional period would provide the Weather Bureau with an opportunity to staff for the management of the network and to take appropriate steps to budget for the program.

The Chief of Bureau pointed out that the greatly expanding job of the Weather Bureau creates a need for more scientist-executives in meteorological research and development. To meet this requirement, we must try to find ways to develop the executive abilities of our personnel. Mr. Carlin spoke briefly about the Personnel Division's tentative plans for developing scientist-executives. These plans include a Resident Research Associateship program in cooperation with the National Academy of Sciences-National Research Council.

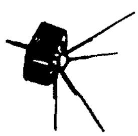
There was a general discussion of instrumentation and atmospheric measurements. Some of the problems discussed were (1) measurement of meteorological elements up to 100,000-125,000 feet, (2) placement of instruments in "no data areas," (3) measurement of winds aloft over ocean areas, and (4) the degree of accuracy required or desired. Various methods of solving the instrumentation problems were considered. Mr. Showalter reported a shortage of competent staff for instrumental development. The Chief of Bureau asked Mr. Showalter to submit a proposal of what urgently needs to be done in this area during the current fiscal year.

The Weather Bureau is requesting approximately 500,000 square feet of space at the National Bureau of Standards. After the completion of a survey by the Public Buildings Service, costs will be determined and a complete prospectus submitted to the appropriate congressional committees by the General Services Administration.

The Deputy Chief of the Bureau discussed the work that is being done to refine the formula for establishment of new stations. Some of the factors considered, in addition to aviation requirements, are weather variability, population, economic interests, and gross national product.

About the Cover...

The path of Hurricane Carla, with a photograph of the WSR-57 radarscope at Galveston, taken on September 11 at 0855 CST. Also indicated on the cover are:


TIROS III photographed hurricane


Radar detected hurricane's eye


Weather Bureau research aircraft in hurricane


Automatic weather station

USCOMM-WB-DC

CARLA: *Biography of a Hurricane*

The Weather Bureau has been widely praised by the press and by officials of government and private disaster relief agencies for its warnings of Hurricane Carla. On September 12, the day after the storm hit the Texas coast, Vice President Lyndon Johnson stated that government leaders were "highly pleased with the fine performance of the Weather Bureau" in warning Texas and Louisiana residents of the hurricane's approach.

Carla was one of the most destructive hurricanes that ever hit the coast. This storm provided a classic demonstration of the effectiveness of each element of the hurricane detection and warning program. Without the cooperation of many agencies, the storm might have taken thousands of lives in the coastal area. As it was, fewer than 40 deaths occurred, many of them caused by the tornadoes associated with the hurricane.

Navy hurricane hunters and Weather Bureau research aircraft tracked the storm from its inception, keeping close watch on its location and intensity. The automatic weather station, anchored in the Gulf of Mexico, was near the eye of the hurricane. As Carla moved through the Gulf, the automatic station transmitted valuable information on the storm.

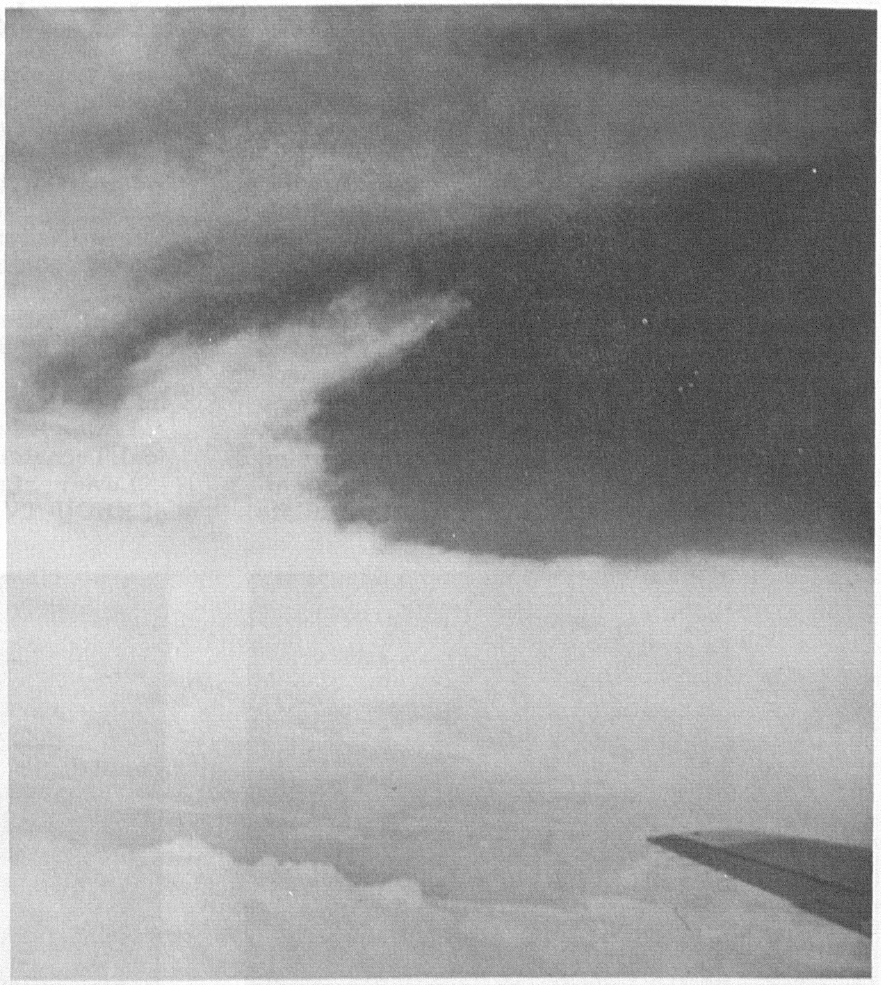
The powerful new weather surveillance radars at Galveston and Lake Charles obtained excellent fixes on the hurricane from the time that it moved within range. TIROS III passed overhead, photographing the storm from 450 miles in space.

The Weather Bureau's timely warnings indicated that tides would reach 15 feet as the hurricane crossed the coastline and that winds near the center were as high as 150 mph. Evacuation of low-lying areas was urged. Radio and television stations along the coast did an outstanding job of warning distribution.

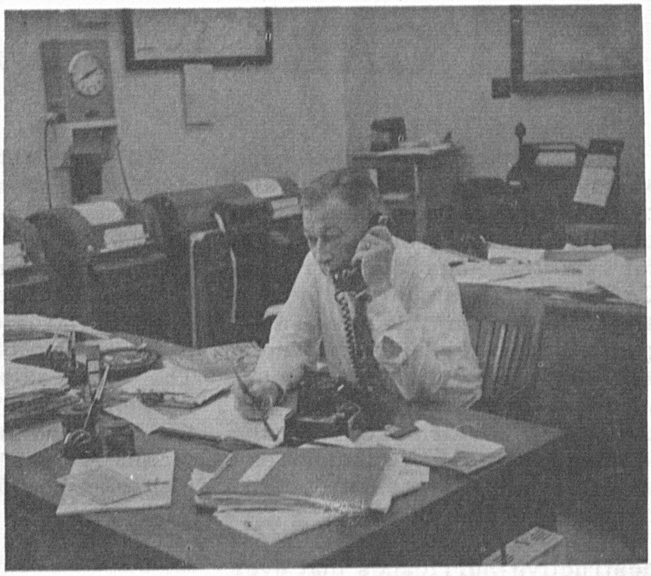
With the aid of the Red Cross and Civil Defense organizations, nearly half a million people were able to leave the coastal area and find shelter in safer locations. The press has called this the greatest mass exodus in the history of the United States. The wholesale evacuation undoubtedly prevented a catastrophe of the proportions of Hurricane Audrey, which took nearly 400 lives in 1957.

The aircraft of the Research Flight Facility flew into Hurricane Carla on September 4, 6, 8, 9, 10, and 11, providing the most extensive research coverage of any tropical storm in history. They investigated the storm from its incipient stages until it was breaking up over land, flying missions from Jamaica, New Orleans, San Antonio, and Dallas.

(continued on page 155)



The eye of Hurricane Carla, as seen from a Weather Bureau research plane on September 8. The eye wall extended up to about 50,000 feet.



Galveston WBO Weathers the Storm

When Hurricane Carla was approaching the Gulf coast, many Weather Bureau stations worked around the clock tracking the storm and issuing warnings.

The Galveston Weather Bureau Office bore the brunt of the public service operations. From Saturday September 9 through Tuesday September 12, the Galveston staff remained on duty. If they slept at all, it was on benches or on the floor.

Houston television station KHOU-TV moved its cameras into the Galveston office and broadcast nearly continuous reports on Hurricane Carla from 3 p.m. Saturday to 10 a.m. Tuesday. The TV cameras photographed the radar screen, allowing the audience to watch the progress of the storm. Other radio and television outlets were permitted to rebroadcast any of KHOU's transmissions from the Weather Bureau Office.

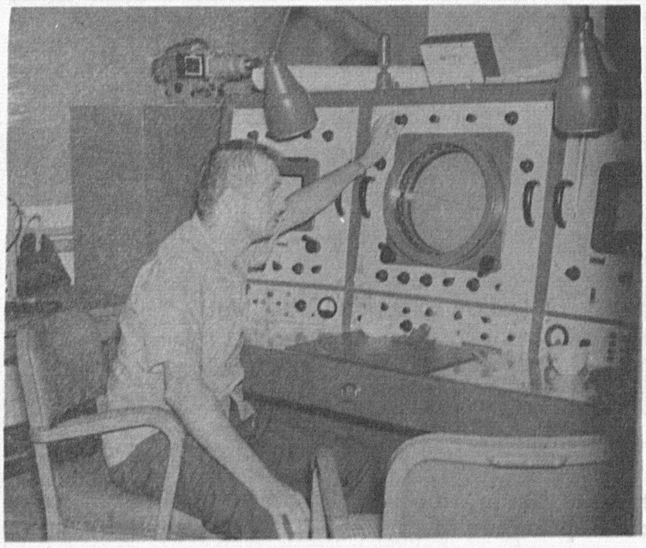
The photographs on this page were taken in the Galveston office during the long siege.

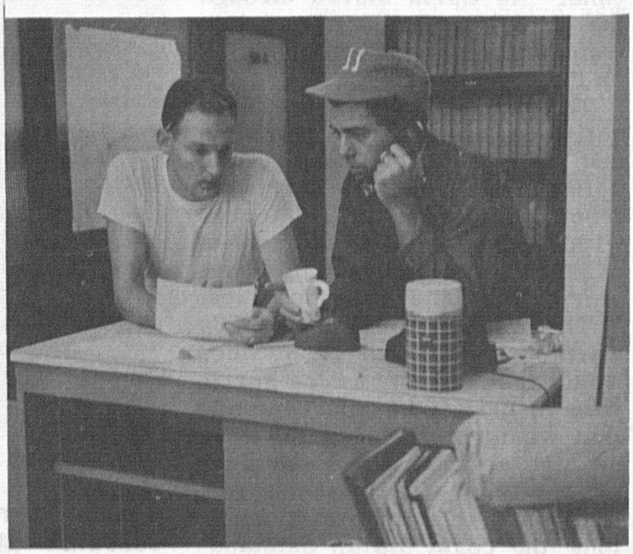
Upper left, left to right: Davis Benton (Radar Meteorological Technician), Carter Moore (Radar Meteorological Technician), Paul Curtis (Electronic Maintenance Technician), and Edgar Fain (Electronic Maintenance Technician), after 72 hours of continuous duty.

Upper right: Ernest Carson, Meteorologist in Charge, handles a telephone request for information.

Lower left: Davis Benton, Radar Meteorological Technician, at the radar console.

Lower right: Mr. Wisner and Dan Rather of KHOU-TV.





(continued from page 153)

The Bureau planes penetrated the hurricane at elevations from a few thousand feet up to 45,000 feet. On one occasion, an Air Force U-2 gathered data at 70,000 feet.

First indications of the storm came on September 4, when ships reported a weak tropical disturbance in the western Caribbean. Navy hurricane hunters were dispatched to the area on the same day and confirmed the ship reports. Also on September 4, the Weather Bureau's research aircraft began studying the storm for the National Hurricane Research Project.

The tropical storm moved northwestward, gathering strength, and passed between the rawinsonde stations on Grand Cayman and Swan Islands. The station at Grand Cayman suffered considerable damage. By the time it approached the Yucatan Channel on September 6, Carla had reached hurricane force. Already, the northern Gulf coast had been alerted by the Weather Bureau to watch for future advisories and bulletins.

The storm entered the Gulf of Mexico and moved erratically toward the northwest, still growing in size and intensity. A hurricane watch, from Morgan City, Louisiana, to Apalachicola, Florida, was first ordered on September 8 and on the same day was extended to include the entire Texas coast. When Carla reached the center of the Gulf on September 9, hurricane emergency warnings were issued for the coastal area from Freeport, Texas, to Grand Island, Louisiana. On the following day, the warnings were extended southward to Aransas Pass, Texas.

While this huge storm was in the center of the Gulf of Mexico, its effects were felt around the entire perimeter of the Gulf. The new WSR-57 radar sets at Galveston and Lake Charles first observed the hurricane's eye on September 10, when it was 220 nautical miles from Galveston. Hurricane warnings were extended to Corpus Christi. On the same day, TIROS III made excellent photographs of Carla, showing the tremendous extent of the storm.

The hurricane struck the Texas coast near Matagorda Bay on the afternoon of September 11. Its winds were as high as 150 mph, whipping the tides to 15 feet above normal in some places. After moving inland, the storm veered to the north and gradually weakened. In some areas of northeast Texas, 15 inches of rain fell as the dying storm moved northward. The rain from Carla, added to previous heavy rains, caused flooding throughout the South Central States.

Agricultural Weather Services To Be Provided In Eight Areas

By next spring, agricultural weather services will be provided by the Bureau in eight broad areas of the United States. This expanded program is made possible by a $758,000 appropriation of the 87th Congress.

Teletypewriter circuits, now being established in each area, will carry frequent and timely agricultural forecasts to local radio and television stations, as well as to farm publications and newspapers. The forecasts will assist farmers in determining the best times for planting, spraying, harvesting, and other vital operations.

In addition to three daily special agricultural weather forecasts and a daily "Farm Weather Summary," the teletypewriter loops will permit rapid dissemination of fire-weather forecasts, agricultural interpretations of the 5-day and 30-day weather outlooks, and other information of value to agricultural interests.

The teletypewriter networks will also allow rapid, round-the-clock distribution of general weather forecasts and severe weather warnings to rural areas.

The first stage of the program is scheduled to begin October 1, before the end of the crop season, in the Mississippi Delta area. The Delta project, which has been in operation since 1958, will be expanded to include southern and eastern Arkansas, western Tennessee, extreme southeastern Missouri, and northeastern Mississippi. The Mississippi Delta pilot project during its first year of operation saved farmers in the area an estimated several million dollars in replanting and spraying costs.

By the spring of 1962, the program will be extended to seven additional areas: the lower Rio Grande Valley; an area covering southwest Georgia, southeast Alabama, and central northwest Florida; western lower Michigan; a region including northeastern West Virginia, western and central Maryland, south-central Pennsylvania, and northern Virginia; New Jersey; Oregon; and southern Idaho.

Networks of observation stations will report daily during the crop season, keeping the forecasters informed about weather in the immediate crop-growing areas and providing data for crop-weather studies.

In cooperation with specialists from the Department of Agriculture, Weather Bureau meteorologists will conduct technical studies of the effects of weather on agricultural activities.

Although the agricultural forecasts will be prepared by Weather Bureau offices already established in each area, about 50 employees will be assigned to the agricultural program. Of these, approximately 35 will be professional meteorologists; the remainder will be technicians, communicators, and secretarial employees. One Advisory Agricultural Meteorologist will be assigned to an Agricultural Experiment Station in each area or state.

The Weather Bureau's 70th anniversary had excellent coverage in th'n's press. Background material supplied to the newspapers by our stations in the field made stories like these possible.

8 Hilo Tribune-Herald, Monday, July 3, 1961

U.S. Weather Bureau Marks 70th Anniversary

By HOWARD PIERCE

ward, in plotting his course before take off at the Jackson Municipal Airport.

Jackson Weather Bureau Dates Back 112 Years

Weather Bu... Years as Civ...

The Columbia weatherman, once doubtless attired in military togs, now dresses in mufti in keeping with what has been essenti... civilian calling...

Marks 70 ... Agency

Weather Bureau Here Joins Nation To Mark 70th Year

By TOM McCALLUM
Staff Writer

MEDFORD MAIL TRIBUNE, MEDFORD, OREGON

Weather Reporting Here Dates Back to 1889

Weather Bureau office at Salt Lake Airport.

More Hits Than Misses

70th Birthday Nears For Weather Bureau

By BOB KOENIG
Deseret News Staff Writer

The U.S. Weather Bureau—possibly second only to mothers-in-law as the biggest target of the nation's gag writers and cartoonists—celebrates its 70th birthday Saturday.

6-C ALABAMA JOURNAL
MONTGOMERY, ALABAMA

Weather Bureau 70 Years Old; Has Seen Some Stormy Times

The U.S. Weather Bureau at Dannelly Field joined other bureaus throughout the ...

SUNDAY, JULY 2, 1961

The Independent Record, Helena, Montana, Sunday, July 2, 1961

Page Ten

Helena Weather Bureau Celebrating 70th Anniversary

Weather Station Here Is 81

With the advent of the Biblical three score and 10 for the U.S. Weather ...

Weather Bu... 70-Years-Old

Weather Bureau Celebrates 89 Years Service in Alpena

By BOB WESTROPE

New MIC's

WBAS, Cheyenne

Arthur H. Hosick, the new Meteorologist in Charge of the Weather Bureau Airport Station in Cheyenne, has been Principal Assistant and Climatologist at that station since 1952.

Mr. Hosick graduated from Nebraska Wesleyan University and has also attended New York University and the U.S. Department of Agriculture Graduate School. He entered the Weather Bureau in 1940 as a Junior Observer at Omaha and has served since at the Central Office, Seattle, and Cheyenne.

Mr. Hosick's bureau career has twice been interrupted by military service. From 1942 to 1946, and again during the Korean war, he was a forecaster with the Air Weather Service.

WBAS, Bismarck

The new Meteorologist in Charge at Bismarck, Alfred A. Skrede, has been a Forecaster at that station since 1956. Previously, he was Official in Charge at Grand Rapids for ten years. He has also served at Williston, North Dakota, and was an Airway Observer at Grand Forks, North Dakota, for three years.

Mr. Skrede attended the University of North Dakota and served as a weather forecaster in the Air Force from 1941 to 1945.

WBAS, Burlington, Vermont

The new Meteorologist in Charge at the Burlington Weather Bureau Airport Station is Robert S. Ingram. Mr. Ingram's most recent Bureau assignment was at the Observational Test and Development Center in Sterling, Virginia. He entered the Weather Bureau in 1948 as a FAWS Forecaster at Boston and has also served at Kansas City and Honolulu.

Mr. Ingram is a graduate of Williams College and later attended Massachusetts Institute of Technology and the U.S. Department of Agriculture Graduate School. He served for four years as an aerological officer in the U.S. Navy.

Meacham, Oregon

Walter J. Powell became the new Official in Charge at Meacham, Oregon, on September 3.

WBO, Asheville

Earnest A. Rodney, formerly Assistant Chief of the Radiomarine Section of the Forecasts and Synoptic Reports Division, is the new Meteorologist in Charge of the Asheville Weather Bureau Office.

Mr. Rodney is a graduate of Pennsylvania State Teachers College and has attended the University of North Carolina and the U.S. Department of Agriculture Graduate School. From 1940 to 1942, he taught high school mathematics and science in Burgaw, North Carolina.

While in the service during World War II, Mr. Rodney attended the Air Force School of Meteorology at Grand Rapids, Michigan, the Air Force Weather Observers School at Chanute Field, Illinois, the Air Force Staff Officers School (Weather) in Orlando, and the Air Force Flight Control Officers School on Long Island.

From 1946 to 1948, he was a civilian meteorologist with the Air Force at Pope Field, Fort Bragg. He served at the Weather Bureau Office in Asheville from 1949 to 1951 as fire-weather forecaster and Principal Assistant. He was then transferred to Greensboro, where he served for five years as Principal Assistant at the Weather Bureau Airport Station. Mr. Rodney's other Weather Bureau assignments include Washington National Airport and the Weather Bureau Airport Station at Jacksonville.

Six Bureau Men Attend Pacific Science Congress

Six Weather Bureau meteorologists participated in the Tenth Pacific Science Congress, which was held in Honolulu from August 21 to September 6 under the auspices of the Pacific Science Association.

Dr. Harry Wexler, Director of Meteorological Research, was a member of the Executive Committee of the Congress, and Dr. David I. Blumenstock of the Pacific Supervisory Office, was program chairman.

The Matthew Fontaine Maury Memorial Symposium for Antarctic Research was held on August 22 and 23, with Dr. Wexler as Convener. Morton J. Rubin, of the Polar Meteorology Research Project, participated in the symposium with a paper on Atmospheric Advection and the Antarctic Mass and Heat Budget.

Nels E. Johnson, Pacific Supervisory Officer, served as Co-Chairman of the meteorological sessions on August 26.

On August 30, Dr. Lester F. Hubert of the Meteorological Satellite Laboratory chaired a session on Meteorological Results from Satellite Measurements, in which he also read a paper on Relations Between TIROS Cloud Patterns and the Field of Motion. A joint paper on Meteorological Analysis of TIROS II Radiation Data, prepared by Drs. D.Q. Wark and G. Yamamoto of the Meteorological Satellite Laboratory, was presented during this session by Dr. Yamamoto.

Bureau Personnel Launch Rockets At Two Stations

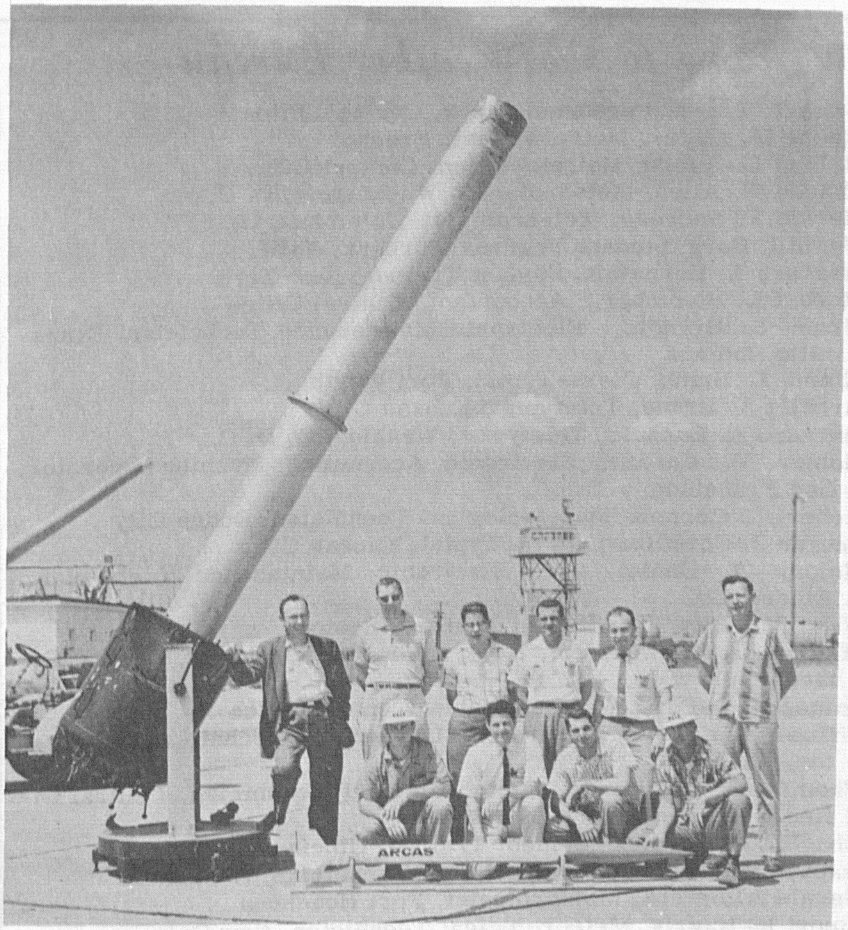
This spring, Weather Bureau personnel at Eniwetok and Wallops Island were trained in various phases of rocketsonde observations. In the future, they will prepare and launch rockets for all meteorological rocketsonde programs.

Weathermen at the Pacific Missile Range Station on Eniwetok participated in 25 rocketsonde observations from April 24 through May 15. One of the launchings was handled entirely by the Weather Bureau personnel, except for the operation of the acquisition and tracking radar.

Weather Bureau men assigned to the NASA Pilotless Aircraft Research Station at Wallops Island, Virginia, have completed a course in missile operations. On the final day of the course, June 14, they fired two ARCAS rockets and performed all of the associated duties, such as assembling and balancing the rockets, placing the rockets in the launchers, computing the ballistic wind, providing tactical forecast support, and tracking an ARCSONDE with a GMD wind-finding set.

One of these rockets was an ARCAS-ARCSONDE, which carries a 1680-mc. sonde in the nose cone for telemetry. The instrumented nose cone is ejected at apogee, and measurements of temperature are transmitted to a ground station as the cone descends by parachute. This rocket attained an altitude of 202,750 feet, and the sonde was tracked by GMD from the launcher up and over apogee and on descent for a total of 70 minutes.

The other rocket was an ARCAS-ROBIN which carried an inflatable sphere (radar target) payload. This reached an altitude of 262,000 feet - the highest ever achieved at Wallops Island by an ARCAS rocket.



Bureau personnel at Wallops Island are now firing meteorological rockets on a regular schedule. On the launching pad in the shadow of the ARCAS launcher are: (standing, left to right) John F. Spurling, NASA meteorologist and training coordinator; Tord Lundblad, Swedish engineer visiting the station for rocketsonde training; Ralph L. Cutshall; Robert J. Mullin; Alden P. Richter; William E. Higgins; (front row) Joseph H. Brewton; Lloyd P. Chamberlain; Richard W. Kelly; and Harold E. Boone. (NASA Photograph)

New Computer In Use At Asheville

On July 15, the National Weather Records Center in Asheville began using a new Honeywell 800 computer for analyzing weather data.

This new computer can perform an average of 30,000 arithmetical operations per second. It is capable of doing up to eight independent data processing jobs simultaneously, with each job sharing the time of the high-speed central processor.

At present, the machine has attachments that can read 650 cards a minute and punch out 250 cards per minute. New equipment to be in operation soon will include a second card reader, two magnetic tape units capable of reading or writing over 40,000 characters per second, and a printer capable of printing 900 lines per minute. Even these devices will not use the full capacity of the new equipment. The present 44,000 digit memory capacity of the computer can be increased to 350,000 digits. More tape units, card readers, card punch machines, or printers can be added as the need arises.

Welcome to the Weather Bureau

Julia T. Ahern, Personnel Clerk, Central Office
Bruce M. Aikins, Meteorologist, Fresno
Robert L. Allard, Mathematician, Central Office
Claude W. Allen, Meteorologist, Washington, D. C.
Gerald E. Andress, Meteorologist, Columbus, O.
David I. Berg, Student Trainee, Burbank, Calif.
Barbara E. Bernstein, Student Trainee, New York
Robert L. Bloomberg, Accountant, Central Office
Frank L. Branom, Electronic Maintenance Technician, Evansville, Indiana
Emma L. Brink, Clerk-Typist, Fort Worth
Ardella A. Bruce, Teletypist, Kansas City
Bernard A. Bucholc, Teletypist, Washington, D. C.
Homer V. Callier, Electronic Accounting Machine Operator, San Francisco
Robert L. Cornell, Meteorological Technician, Dodge City
Louise J. Cornelius, Clerk-Typist, Kansas City
Emory A. Daniel, Jr., Electronic Maintenance Technician, Athens, Ga.
Fred A. Davis, Jr., Student Trainee, Boston
William J. Drewes, Jr., Supervisory Meteorologist, Central Office
James E. DuBard, Mathematician, Central Office
William O. Ennis, Electronic Maintenance Technician, Huntington, W. Va.
Thomas F. Finnin, Jr., Meteorological Technician, Central Office.
Charles L. Gorsuch, Student Trainee, Cincinnati
John A. Guarnotta, Meteorological Technician, Boston
Gerald A. Haluck, Meteorologist, Fort Huachuca
Stuart K. Harris, Meteorological Technician, New Orleans
Elwood M. Harte, Electronic Maintenance Technician, Wallops Island
Louise S. Harvey, Clerk-Typist, Central Office
Kenneth C. Hobbs, Student Trainee, Kansas City
Samuel E. Howie, Jr., Meteorological Technician, Central Office
William E. Jackson, Meteorological Technician, Washington, D. C.
Alice M. B. James, Procurement Clerk, Central Office
Kenard H. Jensen, Meteorological Technician, Washington, D. C.
Martin R. Kaufman, Meteorologist, Cheyenne
John Thomas Kuhn, Meteorologist, Chicago
Ralph B. Lee, Electronic Maintenance Technician, Raleigh
Paul E. Lehr, Meteorologist, Central Office
James L. McElroy, Student Trainee, Great Falls, Mont.
David J. McIver, Student Trainee, Seattle
Charles Mallen, Electronic Technician, Fort Huachuca
Frank Marinelli, Engineering Technician, New York
Leroy E. Martell, Meteorological Technician, Anchorage
Elizabeth K. Michael, Clerk-Typist, Washington, D. C.
Earl L. Miller, Jr., Meteorological Technician, Albany
Marian O. Minkler, Clerk, Anchorage
DeWitt N. Morgan, Meteorologist, Central Office
Maurice E. Pautz, Meteorologist, Kansas City
Charles W. Parker, Student Trainee, Kansas City
Richard A. Proulx, Meteorological Technician, Norfolk
Carl M. Raab, Student Trainee, New York
Robert S. Robinson, Meteorological Technician, Fort Huachuca
Richard G. Schnurr, Mathematician, Central Office

Superior Performance Awards

Lorenz Armstrong, Central Office
Lorne Baily, King Salmon
Joseph Bauman, Eniwetok
Samuel Bromberg, WBFC, Chicago
Eleanore Carlin, Central Office
Lucille Gamache, NWRC, Asheville
Clifford Hall, WBFC, Chicago
Joseph Harden, Richmond
Thomas Harris, WBRS, LaJolla, Calif.
Fred Horton, Roanoke
Patrick Hughes, Washington National Airport
Marvin Hunter, Washington National Airport
Herbert Lieb, Central Office
Maren Madsen, RAO, New York
Eugene Masson, NWRC, Asheville
James McQuigg, Columbia, Mo.
Dale Mohler, RAO, Kansas City
Norbert Novocin, King Salmon
Gerald O'Donnell, Burrwood
Donald Pray, Waterloo
Fern Reid, RAO, Salt Lake City
George Richardson, Columbia, S.C.
Karl Staack, RAO, Anchorage
Paul H. Swope, WBFC, Chicago
Thomas Tatekawa, Eniwetok
Delmar Taylor, RFC, St. Louis

RETIREMENTS

Earl C. Thom

Earl C. Thom, a Meteorologist in the Climatological Investigations Branch of the Office of Climatology, retired on August 1 after 29 years of Government service. Mr. Thom was a Junior Observer at Denver from 1931 to 1934 and then left the Weather Bureau to serve with the Forest Service and the War Department. In 1935, he rejoined the Weather Bureau in Washington and has remained in the Central Office since that time. Mr. Thom attended Campbell Junior College, the University of Kansas, York College, and the Department of Agriculture Graduate School. Before entering the Weather Bureau, he taught high school in Nebraska, Colorado, and Missouri. Mr. Thom's address is 312 Pennsylvania Avenue, Falls Church, Virginia.

George Siebert

George Siebert, a Meteorological Technician at the Charleston, South Carolina, Weather Bureau Airport Station, retired on July 28. Mr. Siebert was in the Air Weather Service from 1951 until 1955, when he entered the Weather Bureau at Charleston. His address is 124A Beaufair Street, Charleston, South Carolina.

Betty L. Jackson

Mrs. Betty Lee Jackson, a Meteorological Technician at the National Weather Records Center in Asheville, retired on July 26. Mrs. Jackson worked for the Post Office Department and the General Accounting Office, before moving to the National Weather Records Center. Her address is 9-H Dunbar Apartments, Asheville, North Carolina.

Mary D. McCormick

Miss Mary D. McCormick, a Meteorological Technician at the Weather Bureau Airport Station in Philadelphia, retired on July 28 after 17 years with the Bureau. From 1939 to 1943, Miss McCormick was employed in private industry. She came to the Weather Bureau in 1943, and has served at Philadelphia and Washington. Miss McCormick's address is 433 South High Street, West Chester, Pennsylvania.

Willard E. Dickinson

Willard E. Dickinson, a Meteorological Technician in the Central Office, retired on July 28, 1961. Mr. Dickinson attended Thompson's Business School in Holyoke, Massachusetts, and Yale University and served in the Army Air Service from 1917 to 1921. In 1936, he became a Junior Observer with the Weather Bureau at Macon, Georgia, moving later to New Haven, the Central Office, Hartford, Alpena, Topeka, Albany, and the Washington National Airport. In 1946, Mr. Dickinson retired on disability, but he returned to the Bureau in 1957, remaining with the Hydrologic Services Division until his retirement in July. His address is 23 Russell Road, Milldale, Connecticut.

Transfers

	FROM	TO
James A. Anderson, Jr.	Providence	San Francisco
Richard L. Bailey	Fresno	Central Office
Carl M. Boettger	Cincinnati	Anchorage
Patricia A. Burns	San Francisco	Los Angeles
Ray R. Casada	Nashville	Rome, Ga.
Wendell M. Cook	Seattle	Salt Lake City
Frederick L. Crosby	Jacksonville	Jackson, Miss.
Gerard A. DeMarrais	Cincinnati	Los Angeles
Lucius D. Drewry	Cape Hatteras	Charleston, S. C.
David G. Fordham	Waltham, Mass.	Central Office
George W. Geisler	Honolulu	San Juan
Anthony Giarrusso	Shippingport,Pa.	Central Office
Bernard Gramfal	Truk	Yap, T. T.
Carl B. S. Gullach	North Platte	Kansas City
Gilbert A. Hanaike	Fort Huachuca	Johnston Island
James A. Harding	Grand Cayman, W.I.	Cold Bay, Alaska
G. Cleveland Holladay	Philadelphia	San Juan
Galen A. Joel	Ponape	Truk, T. T.
Lester A. Johnson	San Francisco	Washington, D. C.
Jerry D. Kanupp	Asheville	Nashville
Garland F. Kopp, II	Dodge City	Alamosa, Calif.
Leif Lie	Albany	Anchorage
Robert E. McGlon	Anchorage	Annette, Alaska
Joseph A. Miller	Columbia, Mo.	Kansas City
Lawrence J. Morley	Norfolk	New York
Albert G. Oertel	San Francisco	Redding
Duane C. O'Malley	Omaha	Minneapolis
Robert J. Pannuto	Norfolk	New York
Rayburn G. Pyle, Jr.	Jackson, Miss.	St. Louis
Callus C. Quigley	Los Angles	Wallops Island
Frank W. Reanier	Fresno	Seattle
Albert Romero	Anchorage	Cold Bay, Alaska
David Ronaldson	Barter Island	Fairbanks
Winfield C. Schomp	Newark	Hartford
Arthur F. Shumski	Nantucket	New York
Herman C. Steffan	San Francisco	Asheville
Burton J. Teague	Cleveland	Akron
Robert L. Tison	Chicago	Denver
James A. Vermoch	Chicago	Shannon, Ireland
Vernon W. Wallace	Helena, Mont.	Roseburg, Ore.
Derald T. Wiley	Medford	Salem, Ore.
Bruce J. Winton	Anchorage	Annette, Alaska

Merit, Qualifications Stressed In Bureau's Personnel Actions

Employment Practices

It is the policy of the Weather Bureau that all appointments, promotions, or other personnel actions that affect an employee's status, shall be made solely on the basis of merit and qualifications, except as otherwise provided by law or regulation. No discrimination in any form, including failure to effect personnel actions, shall be exercised because of race, color, religion, or national origin. It is the responsibility of every official, supervisor, and employee of the Weather Bureau to make this policy effective.

Employment Policy Complaints

Any Weather Bureau employee who feels that an unfavorable personnel action has been taken by the Weather Bureau because or race, color, religion, or national origin, may submit a complaint to the Deputy Employment Policy Officer or the appropriate Regional Employment Policy Officer, the Employment Policy Officer for the Department of Commerce, or the President's committee on Government Policy.

Any employee contemplating the filing of a complaint is urged to seek informal adjustment with his immediate supervisor and personnel officer before submitting the complaint for formal consideration. Supervisors and personnel officers are urged to adjust complaints that are well-founded as promptly and fairly as possible. If no satisfactory adjustment can be made, the supervisor or personnel officer should advise the employee how to submit his complaint in writing in accordance with paragraph D-6505, Chapter D-65, Weather Bureau Manual.

A letter of complaint should: (1) specify whether the alleged discrimination is based on race, color, religion, or national origin; (2) disclose the specific action or personnel matter complained of; (3) give approximate date or dates thereof; (4) identify the official responsible for the action, if known; (5) identify the position involved, its grade, and the unit or office in which located; (6) contain all factual information which the complainant may have to support the allegation of discrimination including dates, names of individuals involved, incidents, occurrences, and circumstances; and (7) if it involves a disciplinary action, set forth the specific allegation of discrimination as distinguished from a mere denial of a "letter of charges" on which the disciplinary action was based.

Time Limit

Written complaints must be filed within 45 days of the specific personnel action complained of, except that a complaint involving a discharge action must be made within 10 days of the effective date of such action, unless the complainant is prevented from filing within the time limits by circumstances beyond his control. A complaint will not be subject to these specific time limits if it is concerned with continuing discriminatory practice.

Employment Policy Officers

Mr. Hyman H. Bookbinder, Special Assistant to the Secretary of Commerce, has been designated as the Department of Commerce Employment Policy Officer. The Chief of the Administrative Operations Division has been designated as Weather Bureau Employment Policy Officer, and the Regional Employment Policy Officers are the Regional Administrative Officers; the Director, NWRC, Asheville, N.C.; the MIC, PSO, Honolulu; and MIC, WBAS, San Juan.

Length of Service Awards

40-Year

Roy J. McClurg
WBAS, Valdosta, Ga.

35-Year

John V. Foreman
Adm. Ops., Central Office
William B. Shope
WBAS, Dallas

30-Year

Walter A. Herrick
WBAS, Ely, Nevada
Edward L. Norris
WBFC, Kansas City

25-Year

Alvar Ahola
WBAS, Duluth
Leroy N. Cookingham
WBAS, Wichita Falls, Tex.
Fralan L. Dix
WBAS, Atlantic City
Roger S. Frantz
WBAS, Hartford
John J. Gage
DMO, Kansas City
John W. McCook
Adm. Ops., Central Office
Louis Malkin
DMO, Washington, D. C.
Raymond O. Munn
DMO, Washington, D. C.
John M. Williams
WBAS, Rochester
Frank Zucker
WBAS, New York

15-Year

Harold L. Coleman, Jr.,
NSSP, Kansas City
Geraldine L. Derr
WBAS, Des Moines
Joseph H. Ganser
WBO, Sacramento
Robert P. Grimes
WBAS, Nantucket
John A. McAlvin
WBAS, New York
Edward R. Miller
San Juan
Leo Quintman
WBO, New York

Assignment No. LI: Use of Extended-Range Prognoses for Fire - Weather Forecasting, by Francis D. Bears and DeVer Colson, Monthly Weather Review, Volume 88, Number 4, April 1960.

About the Assignment: This assignment deals with the use of prognostic charts. One article is concerned with the use of 5-day mean patterns in fire-weather forecasting. The other is concerned with the increase of accuracy in forecasting if perfect "progs" were available.

QUESTIONNAIRE

Col. 61 Strong easterly winds blowing across the Cascades in September almost invariably result in the following condition in northwestern Oregon:
1. Widespread shower and thunderstorm activity
2. Rapidly falling pressures
3. Slowly increasing dew points
4. Increased forest fire danger

Col. 62 Figure 1 shows
1. a strong positive high departure of 39 feet off the coast of British Columbia;
2. a typical thunderstorm-favoring pattern for northwestern Oregon;
3. a case that is representative of an average low humidity situation for northwestern Oregon;
4. anomalous flow from the northeast over the Oregon area.

Col. 63 In figure 3 departure from normal heights is not used as a parameter because
1. departure from normal charts are not normally found at a typical field station;
2. the temperature anomaly was found to be a more useful parameter;
3. only slight skill resulted from the use of this parameter;
4. the precipitation anomaly was found to be a more useful parameter.

Col. 64 In the northern Rocky Mountain area lightning represents the primary forest fire danger because:
1. a greater number of cloud to ground strikes is a characteristic of thunderstorms in this region.
2. An extremely high thunderstorm frequency is characteristic of this region.
3. little or no rain reaches the ground in many of the thunderstorms.
4. the strong thunderstorm winds quickly spread the fires.

Col. 65 Mark the correct statements.
1. Northern Rocky Mountain thunderstorm days are found to be well correlated with precipitation and temperature anomalies.
2. The number "19" in the area designated "C" on figure 6 can be interpreted to mean that 38 percent of the maximum number of thunderstorm days fell in this class internal of the parameters.
3. In the study of thunderstorm occurrences in the Northern Rockies no attempt was made to distinguish thunderstorms on the basis of the amount of accompanying precipitation.
4. Useful information on thunderstorm distribution is a direct result of this study.

The next five questions are based on An Experiment in the Use of "Perfect" Prognostic Charts, by Phillip Williams, Jr., pp. 219-222, Monthly Weather Review, June 1960.

Col. 66 Mark the correct statement or statements.
1. The Rank Method of comparison showed different results than the t test.
2. An undesirable feature of the experiment was that no forecaster made forecasts on consecutive days.
3. In verifying, a temperature change less 9° F. was considered a hit in a no-change forecast.
4. Perfect progs (of frontal positions and pressure patterns) do not necessarily insure perfect forecasts.

Col. 67 The month of April 1953, was chosen for this experiment because: (underline all the correct statements)
1. it was an active month, with plentiful precipitation and variation in temperature
2. it had just recently passed--thus the data was more accessible
3. it had no unusual weather events
4. it was the current month

Col. 68 The t test (a test for significance of results) showed that:
1. all forecasts made with perfect progs were significantly better than the control forecasts
2. all perfect prog forecasts were significantly better than the control forecasts except the temperature change (state forecasts)
3. there was no significant advantage in using perfect progs
4. only the precipitation forecasts were significantly improved by this method

Col. 69 Use of the perfect prognostic charts yielded more improvement in the maximum temperature forecasts than in the minimum because:
1. Max temperatures are more representative of the air mass than minimum temperature
2. Better techniques are available for assessing effects of insolation
3. A second period forecast is nearly always more difficult than either a first or third period
4. Minimum temperatures are more difficult to measure accurately

Col. 70 No forecaster made forecasts on consecutive days because:
1. he tends to repeat his forecast for the second period
2. he had already been given perfect prognostic material for two days ahead
3. prognostic material was not available for the second period
4. it facilitated statistical handling of the results

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CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

C.1

TOPICS

U. S. DEPARTMENT OF COMMERCE
U.S. WEATHER BUREAU
Volume 20 OCTOBER 1961

Editorial

Private Enterprise in Meteorology

"Private enterprise in meteorology" is a subject that is far too broad and diverse in its applications for full consideration here. However, the subject was chosen deliberately to emphasize the broad perspective in which these brief remarks should be read. The Bureau's policy was the subject of remarks reprinted in the July 1961 issue of TOPICS. The purpose here is to re-emphasize cooperation in advancement of applied meteorology and its practice by meteorologists in private business.

All meteorologists, whether they work in government or in private industry, have a common interest in the advancement of the science. The growing use of applied meteorology in business and industry is a great stimulus to this advancement. In any technical field, a vital and vigorous industry, stimulated by private enterprise, provides a powerful "feed-back" into the science itself. From pure science and basic research to the most immediate practical application of the science, a strong private industry strengthens and supports the whole field of meteorology. This effect has been demonstrated so often in other areas of science and technology that we do not need to prove the point here. A healthy private industry provides still another benefit to the whole science by attracting large numbers of young men to enter the field of meteorology each year.

Immediately after the close of World War II, there were great expectations among meteorologists and much optimism over the opportunities for extension of applied meteorology and rapid growth of weather services in private business. The War had brought out new possibilities in meteorological applications and had greatly expanded the interest in and the number of meteorologists engaged in this field of science.

The ensuing years have in fact brought many new applications into use and have also brought very considerable growth in meteorological activities and services in business and industry. There have been growing pains but there has also been real progress. If the growth in applied meteorology and the increase in the private practice of meteorology have not been wholly up to expectations, there are several inherent reasons which probably could be discussed profitably in another time and place.

Although most of us in the Weather Bureau are fully occupied with the increasing volume of regular duties and have little time to promote the meteorological interests of others, there are numerous occasions when we can encourage the development of private enterprise in meteorology and cooperate with private meteorologists in their efforts to develop business uses of meteorological services.

The Central Office is now working with the Committee on Industrial Meteorology, of the American Meteorological Society to develop further means of fostering cooperation between government and private meteorologists. Within the next few weeks, an updated Circular Letter on this subject should be ready for distribution. The recommendations contained in the Circular Letter will be the result of studies and reviews of the many factors involved, including expressions of the public interest in the national meteorological service extending back to the findings of the Compton Committee in 1940. The Central Office also hopes to distribute soon a leaflet on consulting meteorology now being prepared by consulting meteorologists.

FWR

Topigrams

Washington, D.C.
October, 1961

The supplemental appropriation bill, passed by Congress in the last week of September, included 48 million dollars for operation of the new National Operational Meteorological Satellite System (see TOPICS, June 1961). The Department of Commerce Weather Bureau is designated in the bill as the agency responsible for the establishment and operation of this new space system.

An atmospheric pressure wave, caused by the Soviet Union's nuclear test on October 30, was recorded at many Weather Bureau stations in the United States. In this country, the pressure wave was first reported from Seattle, Washington, about 9 a.m. EST. It was recorded in Washington, D.C., about 9:52 a.m. EST. The disturbance generally consisted of a series of rises and falls in pressure, each of about five to ten minutes' duration, the entire series lasting about 25 minutes. The range of pressure changes amounted from about .02 to .06 inches of mercury.

Since the resumption of nuclear testing in the atmosphere, the Bureau's Atmospheric Radioactivity Research Project has been preparing daily estimates of the probable path of the radioactive debris in the upper troposphere and of areas in the United States that can expect to receive fallout. These estimates are transmitted to the Public Health Service, the Atomic Energy Commission, and other interested agencies.

William Ruder is now Assistant Secretary of Commerce for Administration and Public Affairs, serving under a recess appointment from President Kennedy. Mr. Ruder has been Special Assistant for Public Affairs since early in 1961.

Dr. George P. Cressman, Director of the National Meteorological Center, has been elected President of the World Meteorological Organization's Commission for Aerology. Dr. Cressman served as principal delegate from the United States at the Commission's Third Session, which met in Rome from September 18 to October 2.

All TIROS I photographs are now available to the public, in the form of 100-foot reels, from the National Weather Records Center. Key to Meteorological Records Documentation No. 5.31 contains a complete listing of the TIROS I photographs.

Radiotelephone Station KWJ-56 at Yakutat, Alaska, is now broadcasting Weather Bureau marine forecasts and warnings twice daily on a frequency of 2512 kc. The forecasts, covering Alaskan waters from Dutch Harbor to Dixon Entrance, are provided as an additional service to shipping off southeastern Alaska. Transmissions are at 9 a.m. and 8 p.m. daily.

The experimental seeding of Hurricane Esther on September 16 and 17 caused large amounts of water droplets in the subfreezing layers of the hurricane clouds to be converted to ice crystals. An article on the seeding experiment will appear in the next issue of TOPICS.

Briefs from the CO Staff Conferences

Dr. Reichelderfer reported that the question of coordinating hurricane forecasts was raised in a meeting of the Joint Meteorological Group. It is the Bureau's position that, although we welcome advice and information from any source, the statutory responsibility for preparing basic forecasts on tropical cyclones is placed in the Weather Bureau and cannot be delegated to other agencies. There was general agreement that efforts should be made to emphasize this point in next year's interdepartmental agreement on hurricane matters.

The Bureau must soon decide between purchasing the research aircraft or continuing to rent them. Mr. Grubb suggested that the Bureau support purchase of the planes if it can be done without cost to the operating research programs.

Experience in Hurricane Esther again demonstrated the need for critical evaluation of the sources and magnitude of error in our measurements of the wind and pressure fields in hurricanes at sea. Comparison was drawn of the effectiveness of the advices on Hurricane Carla with those on Hurricane Esther.

It was reported that the U.S. Coast Guard had received criticism from shipping and small craft operators that the Weather Bureau's marine broadcasts during Hurricane Carla were too long and confusing. Mr. Vernon said that the Bureau was aware of the problem and that marine advisories had been shortened in recent years. During Hurricane Carla, however, advisories were being issued for two other storms, so the advisories were necessarily longer.

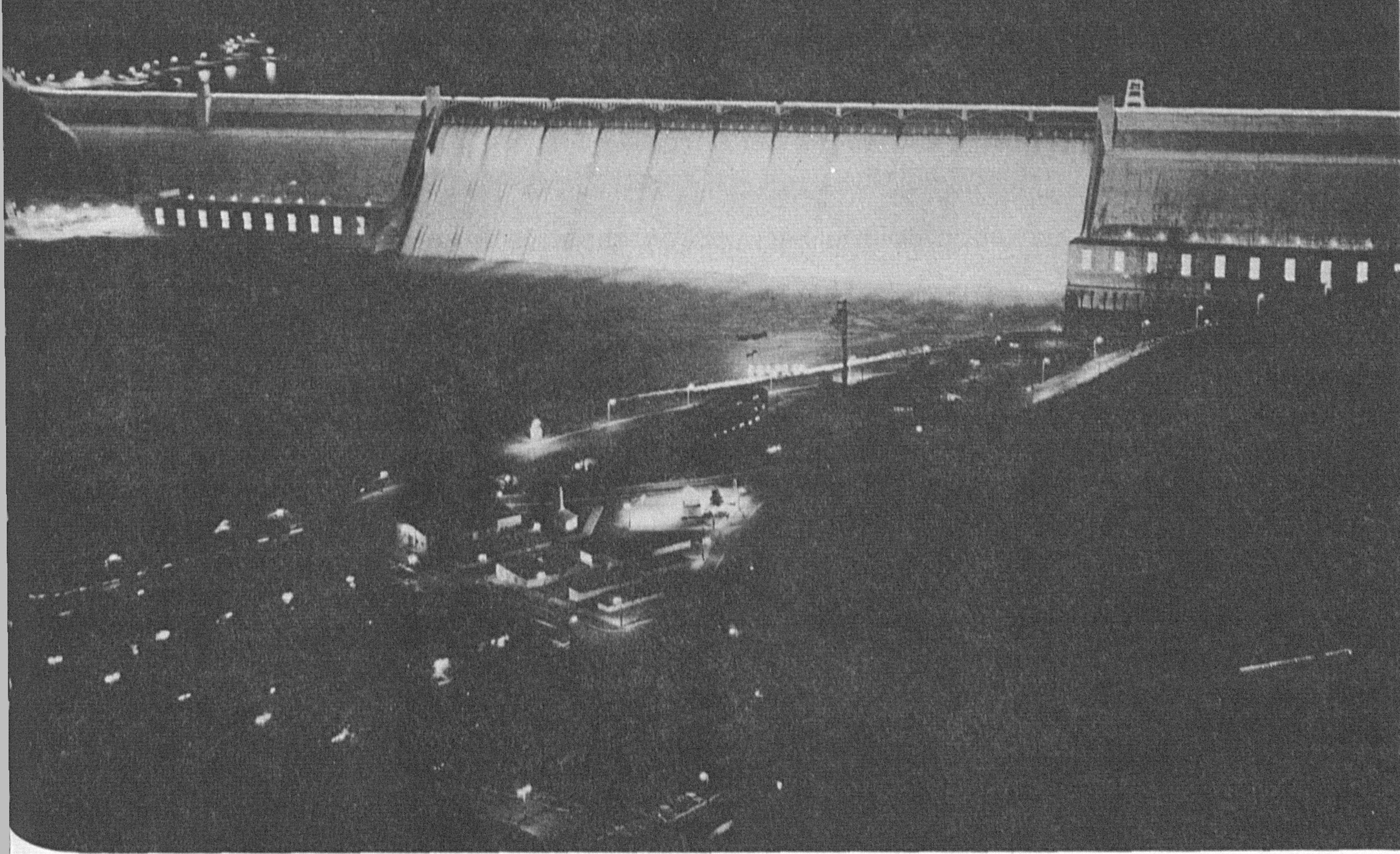
During the next three months, the Bureau of the Budget will study meteorological activities in government. It has been suggested that a committee be established to make an annual evaluation for the Bureau of the Budget of all government projects in the atmospheric sciences.

Mr. Hiatt reported briefly on his trip to Alaska. Primary purposes were to review firsthand the requirements for expanded hydrologic activities in Alaska and to discuss a storm study assignment from the Corps of Engineers on the Yukon River as it pertains to a proposed dam near Rampart. If the latter project goes forward, it will have approximately five million kilowatts installed power and will create a reservoir with a surface area somewhat larger than Lake Erie.

The forthcoming report of the National Academy of Sciences' Committee on Atmospheric Sciences was discussed, and the importance of the report and its impact on the Bureau's long-range plans were emphasized. It appears that the Bureau's plans are consistent with the long-term goals recommended by the NAS committee.

Mr. Kutschenreuter and Dr. Rex, Director of the Office of Forecast Development, reported on OFDEV's first year with a full staff. This office has directed its efforts toward maximizing field use of NMC guidance material.

HYDROLOGY



Water is both the friend and the foe of mankind. Harnessed and properly used, it is one of man's greatest allies. Out of control, it can become a terrifying enemy, destroying life, natural resources, and all of the man-made structures in its path.

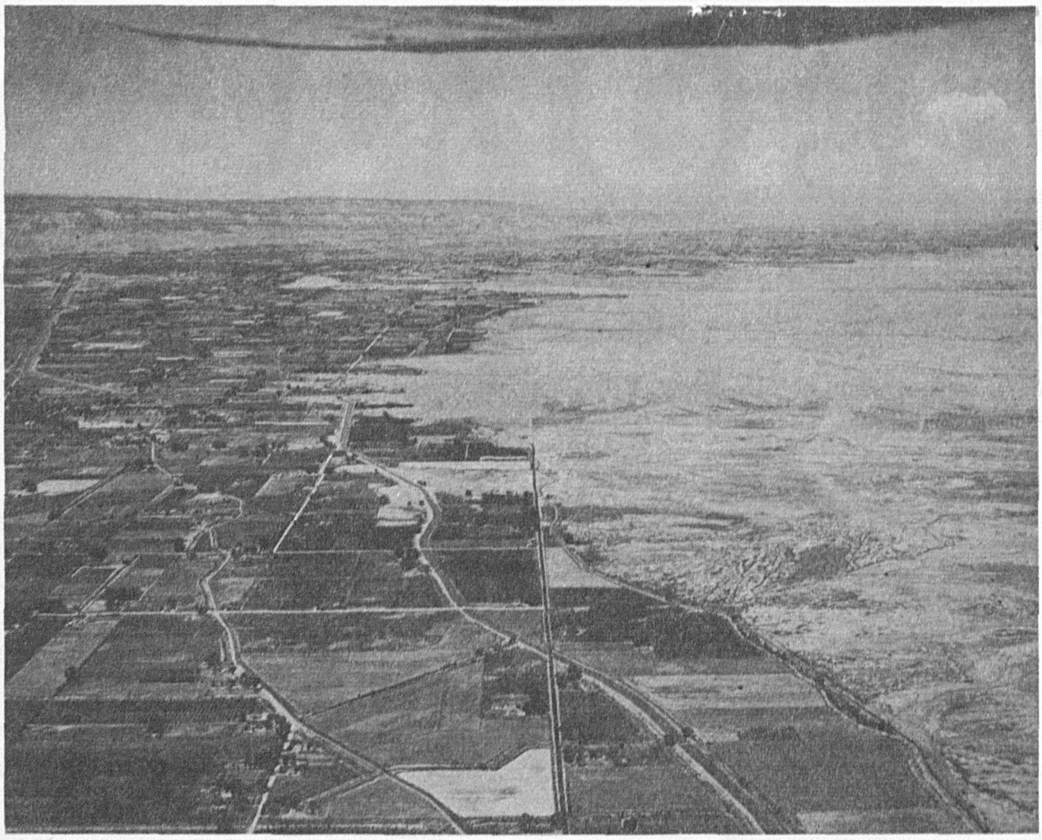
Water is essential to all forms of life on earth. When we see the rivers and oceans, the rain, and the continuous flow of water through our taps, it seems that the supply is inexhaustible. In fact, it is not. The total amount of water on the earth and in the atmosphere remains the same. In a never-ending process, moisture on earth is evaporated and transported into the atmosphere, where it condenses into clouds and precipitation and returns to the earth to begin the cycle anew.

While the amount of water available remains constant, man's uses for it have increased steadily through the ages. Today, water is used not only in the home--for drinking and bathing, in washing machines, for watering lawns, in air conditioners and dishwashers. Large quantities are required by farmers to make arid land productive. Industry uses vast amounts of water for manufacturing and for power.

In modern times, the per capita use of water has doubled with each generation. Furthermore, the population of the United States alone is growing at a rate that will bring an increase of 50 million by 1975. As each man's share of the earth's water supply diminishes, the need for greater understanding of the hydrologic cycle and of water conservation is increasing. Man must learn how to use this resource without wasting it. In the future, he must learn how to distribute water equitably throughout the world--so that deserts may produce food for an expanding population--and so that rampaging floods will not destroy the growing number of cities and industries on river banks or waste essential water that might be used for power and for irrigation.

The earliest records of man noted the periodic floods that occurred all over the earth. Indeed, in many areas such as the Nile Valley, the floods were welcomed as harbingers of prosperity. Here, the floods brought fresh topsoil to the fields along the river and provided water for the crops.

Until the last century, floods



An aerial view of Grand Valley, Colorado, points up the value of water by contrasting the irrigated lands on the left with the desert wastes on the right. (Bureau of Reclamation photograph by Stan Rasmussen)

were met by the general populace with resignation. In most areas, the flood waters followed their natural course to the sea, with few man-made obstructions in their path. Then, with the coming of the industrial age, man began to narrow the natural river channels, building homes and factories on the banks. Bridges, sewers, and other obstructions have been placed in the path of the normal river flow. The many industries that require great quantities of water for their operation naturally locate on the banks of large rivers and cause an increasing density of population in flood-vulnerable areas. Annual flood damages have continued to increase in spite of the protection afforded by a major flood control program.

The earliest studies of the rivers of America were directed toward the improvement of navigation. In 1810, DeWitt Clinton undertook a study of the rivers and lakes in New York State to learn whether they contained enough water to fill the locks of his proposed canal system. The U.S. Army's Corps of Engineers began studying the Mississippi and Ohio Rivers for navigational purposes. It was not until the 1860's that a continuing program of stream gaging was started.

Regular river and flood forecasting service in the United States began in 1871. Originally vested in the Army Signal Service, the program was transferred to the Weather Bureau when it was established in 1891. The Act of Congress creating the Weather Bureau made the Chief of the Weather Bureau responsible for "...the display of weather and flood signals for the benefit of agriculture, commerce, and navigation; the gauging and reporting of rivers..."

In 1891, the Bureau provided river and flood services for the Mississippi River and its tributaries, for the Savannah River, and for the Potomac. 110 river stations and 50 special rainfall stations were in operation. Daily forecasts of river stages, prepared in Washington, were based on measurements at 26 places. According to the 1891 Report of the Chief of the Weather Bureau, the routine forecasts were couched in very general terms, such as "The rivers will rise," "The rivers will fall," or "The rivers will remain about stationary." When flooding was imminent, definite forecasts of expected stages were issued.

The river and flood service was decentralized in 1893, and observers at the principal river stations were given forecast responsibility for their areas. A system of *16 river districts* was established and increased to 37 by 1895.

In 1897, according to the *Report of the Chief of the Weather Bureau*, "The principal rivers concerned in the Weather Bureau system are the Allegheny, Monongahela, Ohio, Kanawha, Wabash, Illinois, Tennessee, Cumberland, Mississippi, Missouri, Arkansas, and Red Rivers of the central valleys; the Columbia, Sacramento, and San Joaquin of the Pacific Coast, and the Hudson, Susquehanna, Potomac, Savannah, Chattahoochee, and Alabama Rivers of the Atlantic and East Gulf coasts."

At times, novel methods of warning the public were used in addition to telegraph, telephone, mail, and the newspapers. The Bureau's Report for 1898 points out that, during a flood on the Arkansas River, "The Little Rock Board of Trade...chartered the steamer 'Irma' and sent her 70 miles down the river, with instructions to stop at every landing and settlement, to blow her whistle and distribute the flood warnings, and to give every person who came to the landing full information in order that every precaution to save life and property might be taken."

Through the early years, the Bureau slowly increased its river services. When necessary, warnings of low water were issued for the benefit of navigation. Improvements were made in river gages, and new stations were added to the network.

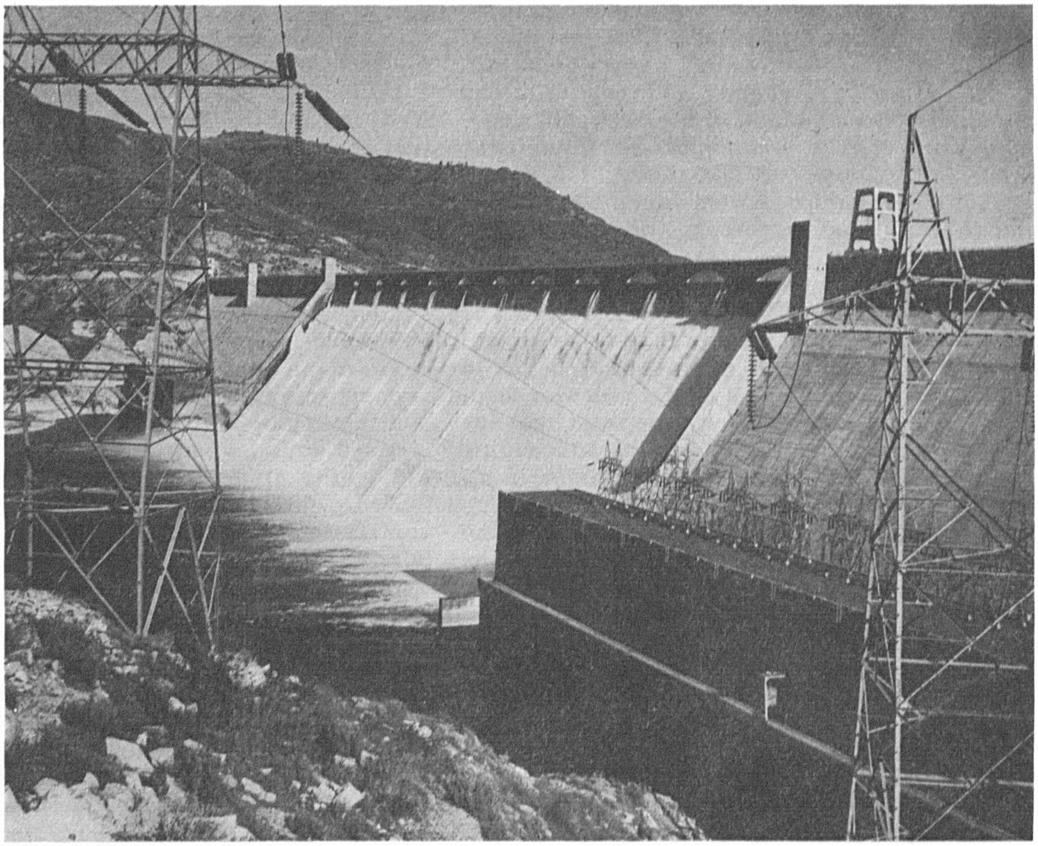
The extensive and disastrous floods of 1903 brought a public clamor for an extension of the flood services. Shortly thereafter, the river and flood service was made a separate division of the Weather Bureau. The service was expanded in Texas, and a new service was begun in the Kansas River watershed, where severe flooding had occurred in 1903. The succeeding years saw great expansion in all parts of the country.

In the second decade of the 20th century, the establishment of irrigation projects in the western United States brought new responsibility to the Weather Bureau. Measurements were made of the snow accumulation in the watersheds to determine its water equivalent, and the River and Flood Division began to prepare advance forecasts of the water that would be available for irrigation each season.

In 1933, a $150,000 allotment from the Public Works Administration enabled the Bureau to install substantial modern river gages, vastly improving its stage and flood forecasts. Under other depression - era projects, the W.P.A. collected and tabulated evaporation records for the entire country and prepared river basin maps showing precipitation and river gaging stations. The availability of such data, in easily used form, was a tremendous aid to the science of hydrology.

From 1891 to the present, a continuing research effort has been directed toward the development of improved rules for forecasting floods in each river system of the United States. In the latter part of the 1930's, the Bureau's hydrologic research program expanded rapidly. Studies were made of the maximum flood potential in areas where there were flood-control projects. To

Flooding in Enid, Oklahoma (Photograph courtesy of Enid PublishingCo.)



Grand Coulee Dam, Washington, with the powerhouse in the foreground (Bureau of Reclamation photograph by E.E. Hertzog)

improve forecasts for headwater and tributary areas, Bureau hydrologists began to attack the problem of determining river stages from rainfall data.

By the middle 1940's, it had become clear that the increasing responsibilities of the regular Weather Bureau stations left little time for preparing river forecasts. New field units, called River Forecast Centers, were established to collect reports and prepare forecasts for entire drainage basins. These Centers, of which there are now 11, are staffed with hydrologists trained in the latest techniques.

Today, the Hydrologic Services Division, through its field units, provides daily reports and forecasts of river stages for the benefit of industry and navigation. Flood forecasts are made for headwaters, tributaries, and large rivers, and plans are being made to meet the increasing need for low flow forecasts. Water supply forecasts, based on snow accumulation measurements, are prepared for many western areas.

The Bureau's hydrologic research program ranges from the search for better methods of river and water supply forecasting to the development of means for predicting the amount of rain that will fall within a given time at a specific location. Many studies are conducted for the Soil Conservation Service, the Department of Agriculture, and the Corps of Engineers. With the new techniques and new instruments made possible by these research efforts, the Weather Bureau's improving hydrologic services will certainly bring about the saving of more lives and property and will enable the American people to use their valuable resources more wisely.

(This article is the first of a series on the Weather Bureau's Hydrologic Services Division and hydrologic activities in the field.)

Gordon Dunn Assists East Pakistan In Planning Typhoon Warning System

Gordon Dunn, Chief District Meteorologist at Miami, spent almost three months in Pakistan this spring, assisting the Pakistani government in planning a typhoon warning service.

Two disastrous tropical cyclones hit East Pakistan in October 1960, devastating coastal areas and drowning more than 15,000 people. After these storms, the government of Pakistan asked the International Cooperation Administration to provide an advisor to aid in developing a modern cyclone warning system. The I.C.A. selected Mr. Dunn to serve in this capacity.

In his report, published by the government of East Pakistan, Mr. Dunn observes:

"Without question, the potential for disaster from tropical cyclones along the coast of East Pakistan is greater than anywhere else in the world due to the funneling effect at the head of the Bay of Bengal and the immense population situated in vulnerable areas subject to inundations."

According to Mr. Dunn, one million people live on four major islands at the head of the Bay of Bengal. These islands, whose maximum elevation is 15 feet, are subject to major storm surges. There are no telephones, no radios, and no electricity on the islands, and evacuation in an emergency is considered impossible.

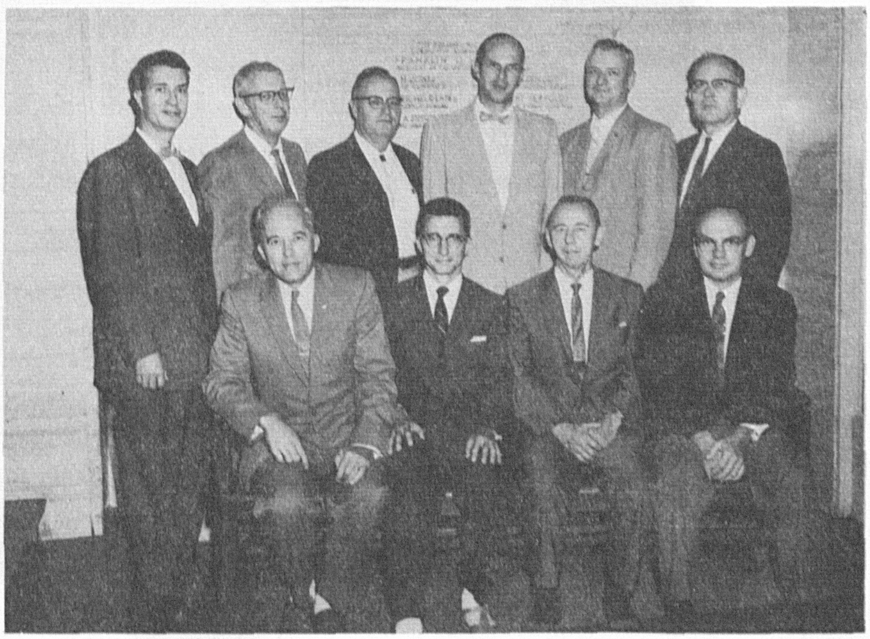
The solution suggested by Mr. Dunn is the building of 1000 earth platforms with a surface at least 25 feet above sea level. If generators and radios were installed to maintain communications with the mainland, rockets and airplanes might be used to spread typhoon warnings. The people could then take refuge on the earth platforms until the flood danger passed.

As a first requirement for an effective warning system, Mr. Dunn recommended the use of aircraft reconnaissance and weather radar. He suggested the relocation of the Regional Forecast Center from Chittagong to Dacca, an inland city where communications are not so likely to be interrupted. An adequately equipped and staffed communications center is needed in the Regional Forecast Center.

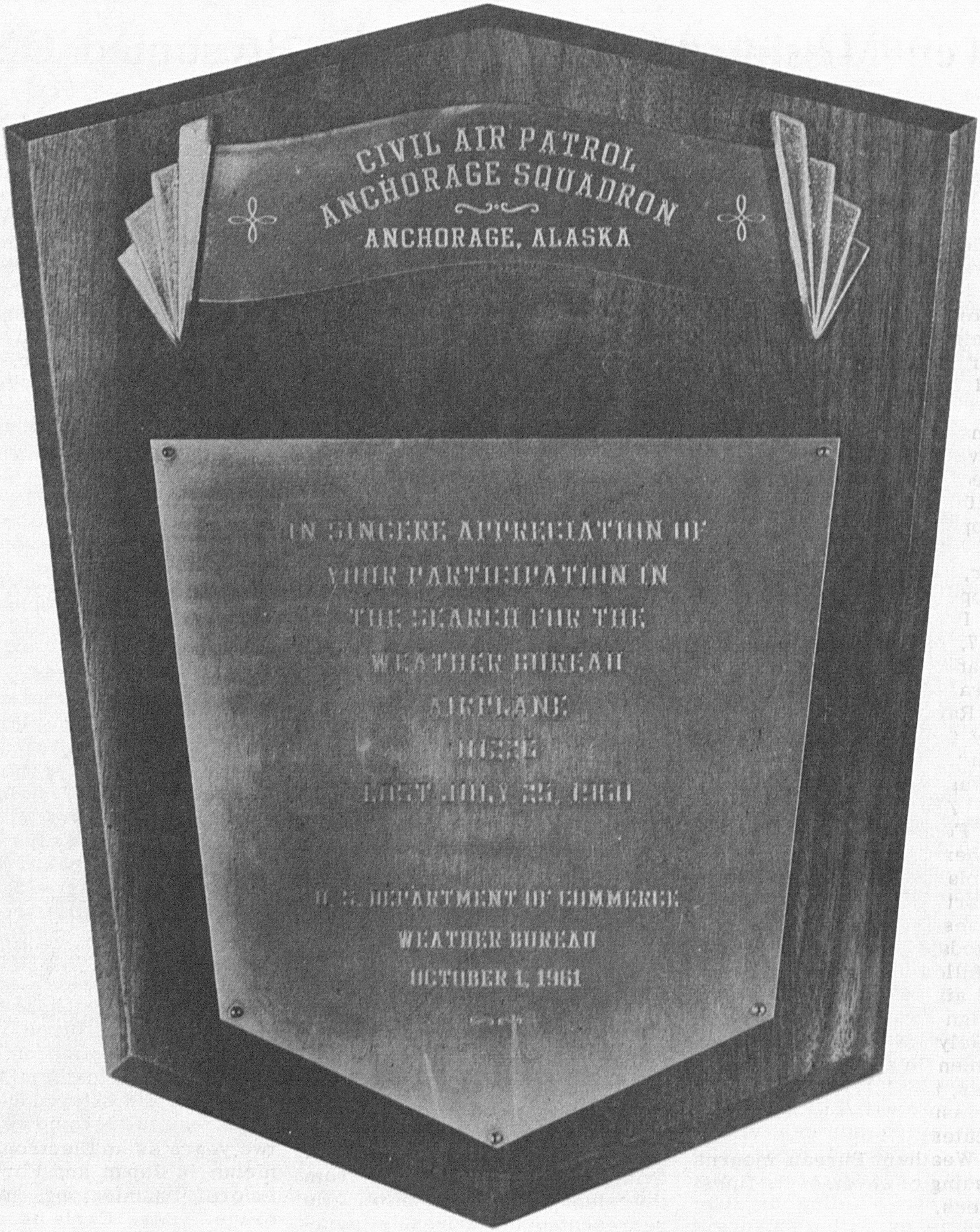
He advised that a severe weather forecasting unit should be established for tropical cyclones, tornadoes, and northwesters. An objective technique for forecasting cyclone movement for the Bay of Bengal, based on surface pressures, should probably be developed on a contract basis.

Among Mr. Dunn's other recommendations were improvement of the upper-air network, arrangements for receiving reports from pilots and from ships, and public education in precautionary measures.

One of the greatest problems in establishing a warning system for Pakistan is communications. Methods must be developed for warning a population that has few radios. Mr. Dunn advised that the communications problems should receive the attention of an expert in this field.



MEMBERS OF THE TWELFTH ADVANCED STUDY GROUP now meeting in the Central Office are: (front row, left to right) Phillip D. Thomas, WBAS, Miami; John T. Riedel, Hydrologic Services Division; Floyd H. Pearson, WBAS, Detroit; Vincent J. Oliver, Group Instructor; (back row, left to right) Albert V. Carlin, Chief, Training Section; Harold N. Burke, WBAS, Cleveland; Wilbert R. Krumm, WBAS, Missoula; Stephen J. Rigney, WBAS, Madison; Ernest M. Rampey, WBAS, Knoxville; and Herbert L. Alkire, WBAS, Baltimore.



On September 29, 1961, this plaque and a certificate were presented to the Anchorage Squadron of the Civil Air Patrol, to express the Weather Bureau's appreciation of the Squadron's efforts to locate the lost aircraft and men. The presentation was made by William E. Hiatt, Chief of the Hydrologic Services Division, on behalf of the Chief of the Weather Bureau. Clyde R. Lewis, Squadron Commander, and J. Vic Brown, Jr., Operations Officer, accepted the plaque for the Civil Air Patrol.

Seven Missing in Alaska Flight Presumed Dead

At 10:16 a.m. on July 25, 1960, the Weather Bureau Beechcraft N122G departed from Anchorage on a flight to Nome. The pilot, George Brewster, and his six passengers were all Weather Bureau employees traveling to Nome for field station inspection and familiarization.

Radar facilities at Anchorage tracked the plane for some distance. Reporting by radio to Skwentna at 10:50, the pilot gave his elevation as 11,500 feet and indicated that he was climbing to 12,100 feet. This was the last report received from the plane.

Later, the plane appeared on the scope of a radar near McGrath. It disappeared from view at 11:07, slightly north of Rainy Pass and headed toward the Cathedral Mountains.

The Rainy Pass area is extremely treacherous, with peaks as high as 11,000 feet. This area was searched intensively by the Air Force, Civil Air Patrol, Federal Aviation Agency, and others. Rumors of low-flying planes and explosions in other parts of Alaska were carefully investigated, without result. Even today, planes flying the route followed by the Weather Bureau aircraft still search for some sign of the wreckage.

On July 27, 1961, after the seven men had been missing for one year, the Secretary of Commerce issued presumptive death certificates.

The Weather Bureau mourns the passing of seven of its finest employees.

Charles Belcher, Jr.

Charles Belcher, Jr., had been stationed at Anchorage since 1953, as head liaison officer in charge of the field inspection program. Following his graduation from the University of New Hampshire, Mr. Belcher worked for a time in private industry and entered the Weather Bureau in 1940 as a Junior Observer at Concord, New Hampshire. After serving at Concord and Newark, he was liaison official at the New York Regional Administrative Office for eight years. From 1950 to 1953, he was stationed at Friendship International Airport in Baltimore and then moved to Anchorage. Mr. Belcher leaves two daughters, Jane Belcher, of Box 3874-K, Star Route B, Spenard, Alaska, and Mrs. Catherine Belcher McCaughey.

Walter H. Brandstetter

Walter H. Brandstetter was a General Meteorologist attached to Civil Defense Regional Headquarters in Everett, Washington. He was a graduate of the University of Wisconsin and served in the Air Force during World War II. Entering the Weather Bureau in 1951, he was stationed first at El Paso and then at Washington National Airport, before transferring to OCDM Headquarters at Battle Creek in 1955. In August 1959, he moved to Everett. Mr. Brandstetter is survived by his wife, Marion M. Brandstetter, of 202 Busch Drive, Snohomish, Washington; two sons, Gary W., 13, and Paul W., 12; and one daughter, Eloise Ann, 10.

George F. Brewster

George F. Brewster was the Weather Bureau's Chief Pilot. As a meteorologist with the Office of Aviation Weather Services his duties included inspection of aviation weather service, from the standpoint of the pilot. He represented the Bureau at aviation meetings and conferences, and during World War II he served as the Bureau's liaison with the military services. Mr. Brewster had been with the Bureau since 1938, when he became a Junior Observer at Bismarck. Later, he was stationed at Detroit, the Arctic, Chicago, and New York. The Central Office had been his headquarters since 1946. Mr. Brewster attended the Science School (Wahpeton, North Dakota), and the University of Minnesota, and graduated from North Dakota State College. He later attended the University of North Dakota and Minnesota State College. Before coming to the Bureau, he was employed as a high school instructor, athletic director, and school superintendent. He is survived by his father Fred A. Brewster, of Wahpeton Rehabilitation Center, Wahpeton, North Dakota, three brothers, and a sister.

Harry C. Carle

Harry C. Carle had been Supervisory Electronic Technician at the Anchorage Regional Administrative Office since 1949. For his outstanding job of supervising the installation and maintenance of electronic systems throughout Region V, he was awarded a Silver Medal by the Department of Commerce in 1957. After attending the University of Chicago, Mr. Carle was a chemist in private industry, and for eight years was co-owner of a company manufacturing mimeograph stencils. From 1943 to 1946, he served as a weather equipment technician in the Army. For two years following his military service, he was director of the maintenance section of the War Department's Weather Electronic School. He entered the Weather Bureau in 1947 and served for two years as an Electronic Technician in Japan and Fort Worth, before transferring to Anchorage. Mr. Carle is survived by his wife, Dorothy T. Carle, of 310 East Dent Street, Ironton, Missouri, and three children: Kathleen E., 10; Patricia J., 8; and William E. Carle, 6.

James W. Grant

James W. Grant, Leading Aviation Forecaster at the Anchorage Weather Bureau Airport Station, had been with the Weather

Seven Presumed Dead *(continued)*

Bureau since 1946. He attended Eastern Oregon College of Education, Brigham Young University, and the University of Washington, and graduated from the University of California at Los Angeles. After a period in private industry and two years as a missionary, he served in the Army Air Corps from 1943 to 1946. Mr. Grant's Weather Bureau career began with six years at Portland, Oregon. From 1952 to 1955, he was Meteorologist in Charge at Lewiston, Idaho. He then moved to Anchorage as Leading Aviation Forecaster. Mr. Grant is survived by his wife, Helen Gates Grant, 534 Columbus Street, Salt Lake City, and five children: James W., Jr., 16; Marilyn, 13; Judith, 10; Susan E., 7; and Robert D., 3.

William B. Lindley

William B. Lindley had been Meteorologist in Charge of the Weather Bureau Airport Station at Anchorage since 1950. He was a graduate of the South Dakota School of Mines and had also attended the University of California at Los Angeles. During World War II, Mr. Lindley served in the Navy as an aerological officer. He entered the Weather Bureau in 1946 and, after a short period of training at Burbank, was transferred to Alaska. He spent two years at Juneau and two years at Fairbanks, before moving to Anchorage as MIC. Mr. Lindley is survived by his wife, Elsie C. Lindley, of 1133 15th Avenue, Anchorage, and a grown son, Richard Jerred Lindley.

Thomas O. McDonald

Thomas O. McDonald was a Classification and Employee Development Specialist at the Regional Office in Anchorage. From 1942 to 1946, he was in the Navy. He joined the Bureau in 1946 at Oakland, California, and served at Honolulu, Boston, Baltimore, Anchorage, and St. Paul Island. Thereafter Mr. McDonald was Official in Charge at Cold Bay for three years and at King Salmon for one year. He returned to Anchorage as a Meteorological Technician and, in early 1960, spent six months in the Central Office for training in personnel management. He had returned to Anchorage in the first part of June. Mr. McDonald leaves his wife, Marilyn J. McDonald, of 6609 West Moltke Avenue, Milwaukee 10, Wisconsin.

DEATHS

Mary E. Bell

Miss Mary E. Bell, who was in charge of Central Office Mails and Files for many years, died on September 16. Miss Bell worked for the Treasury Department, the Government Printing Office, and a commercial bank before entering the Weather Bureau in 1918. She served in the Station and Accounts Division and the Office of the Chief Clerk and transferred to Mails and Files in 1926, remaining there until her retirement in 1948.

Clarence R. Kallquist

Clarence R. Kallquist, Meteorologist in Charge at Chattanooga from 1944 until his retirement in 1959, died on June 22. Mr. Kallquist came to the Weather Bureau in 1922 and served at Due West, Savannah, Groesbeck, Salt Lake City, Seattle, and Portland, Oregon. He was Meteorologist in Charge at New Orleans for six years before moving to Chattanooga in 1944.

Robert T. Lindley

Robert T. Lindley, a retired Bureau employee, died on August 9 at the age of 88. Mr. Lindley entered the Weather Bureau at Milwaukee in 1901 and subsequently served at Nashville, Jacksonville, Asheville, Montgomery, Cairo, and Vicksburg. He was Official in Charge at Vicksburg from 1918 until his retirement in 1942.

Russian Textbook Translated Into English

Dynamic Meteorology, a Russian textbook by V.A. Belinski, has been translated into English under a new program in which United States credits abroad are used for translating and printing foreign books.

When surplus agricultural products are sent from the United States to countries that cannot pay for them, the United States then has "credits" in those countries. Under Public Law 480, a part of these credits has been made available to the National Science Foundation for translations. The National Science Foundation has allotted its credits to various Government agencies.

This program is aimed at the translation of works not already translated by private publishers or by other Government programs. Consequently, emphasis is placed on the translation of older, but still valuable books and publications. At present, Poland, Yugoslavia, and Israel are participating in the translation program.

Dynamic Meteorology is the first of the translations requested by the Weather Bureau to be completed. The translation and printing were done in Israel.

The book is based on a series of lectures given by V.A. Belinski at various Soviet universities and research institutes. It was first published in Russia in 1948 and is used as a textbook for university graduate meteorological courses.

Of the 1000 copies printed, 200 were allotted to the Weather Bureau. These have been distributed to the Weather Bureau Library, all Central Office divisions, and 60 field offices. Other copies are being given to military weather services, universities, and other interested agencies. The remainder are on sale at $6.00 from the Office of Technical Services, U.S. Department of Commerce, Washington, D.C.

Radiosondes Released In L.A. and N.Y. Returned Rapidly

Do weather balloons have a homing instinct? The Central Office is starting to wonder, after receiving so many reports of weather instruments returning virtually to perch on the hands that launched them.

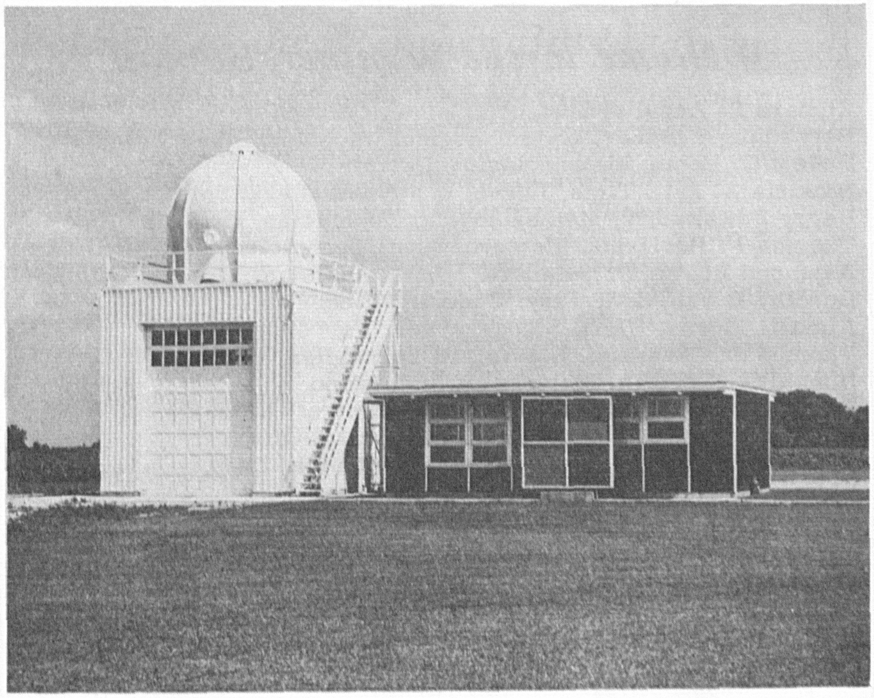
Reports of radiosondes coming home to roost have been published in the past (see TOPICS, May 1960, p. 88), but here is a new twist on the old story, sent in by WBAS, Los Angeles.

A radiosonde was released at 0301 PST, August 17, 1961, from Santa Monica Airport. The balloon burst at 99,000 feet, 90 minutes after release. At 0540 PST it was picked up by a guard at nearby Burbank Airport and handed over to the Burbank WBAS. The Los Angeles WBAS concluded, after mentioning publication of previous incidents involving "homing" radiosondes, "We think that we did a better job in hitting another weather station 14 miles away."

From WBAS, New York, comes an account of a rawinsonde released at 1300 EDT, September 7. The balloon burst 75,000 feet above the city, dropping its instrument at 130th Street and the Belt Parkway, 1-1/2 miles northwest of the release point.

The odd part about it was that the New York police returned the instrument at 1530 EDT--1-1/2 hours after release, and 45 minutes before the coded wind message was transmitted on Service C. "We believe that this is a record time for orbiting a rawinsonde instrument," WBAS, New York wrote.

The New York station had another quick rawinsonde recovery some months ago. An instrument that fell in Westchester County, just north of the city, was speedily returned by a New York Airways helicopter.



Peoria's Inflation Shelter Now Settled in New Location

The recent marked growth in air travel and air transportation has resulted in stepped-up activity around airport terminals. This increased activity has had its effect on the Weather Bureau's upper-air program.

In recent years, employees attempting to release radiosonde balloons in the midst of airport activities have been hard-pressed to find unencumbered launching areas. The problem has become so acute at many airports that the Weather Bureau has "remoted" numerous upper-air facilities.

To provide working and storage space, either an existing structure has been found or a new one has been built away from the terminal area. The old inflation shelter has been moved to the new location, or a new shelter has been constructed.

The recent move of the upper-air facilities at Peoria, Illinois (see TOPICS, April 1961, page 69) is an example of this new trend. The old inflation shelter, which is a metal "prefab" structure, was picked up and moved to a new site, free of tall buildings and other obstructions. At the end of its journey, the shelter was mounted on a new concrete pad immediately adjacent to a new one-story building which provides necessary working space for the rawinsonde specialists and storage for supplies and equipment.

The photograph above shows the new upper-air facilities at Peoria.

Welcome to the Weather Bureau

Richard P. Augulis, Student Trainee, Chicago
Bernadine A. Bauer, Meteorological Technician, San Francisco
Robert G. Behm, Meteorologist, Detroit
Patricia A. Bell, Time, Leave, & Payroll Clerk, Salt Lake City
Harry Edward Bly, Meteorological Technician, Central Office
Thomas F. Borbonus, Meteorological Technician, Central Office
Raymond Brown, Jr., General Supply Assistant, Central Office
Dorothy Burke, Secretary, Central Office
Alma L. Burns, Clerk-Stenographer, Fort Worth
Thomas E. Cavanagh, Electronic Technician, Central Office
Donald G. Coffman, Meteorologist, Fresno
Richard A. Collins, Mathematician, Central Office
Carter C. Cowles, Mathematician, Central Office
Billie Jean Crowe, Clerk-Typist, Oak Ridge, Tenn.
Robert E. Fisher, Meteorologist, Hartford
John Martin Foard, Meteorological Technician, Central Office
Laura M. Foo, Clerk-Typist, Honolulu
Margaret I. Grbich, Meteorological Technician, San Francisco
Mark L. Greathouse, Student Trainee, Portland, Ore.
Arthur F. Gustafson, Meteorologist, Central Office
Robert E. Hamilton, Meteorologist, Kansas City
Gary Arthur Herbert, Meteorologist, Central Office
Stanley Herman, Supervisory Mathematician, Central Office
Harvey C. Hoppe, Electronic Engineer, Central Office
Leslie B. Hottle, Laborer, Sterling, Va.
Arthur M. Hull, Meteorologist, Central Office
Ronald J. Hyrkas, Electronic Technician, Central Office
Robert H. Johns, Student Trainee, Indianapolis
Marguerite L. Johnson, Clerk-Stenographer, Columbia, Mo.
James Lee Kirk, Meteorological Technician, Central Office
Kenneth A. Kraus, Student Trainee, Wilmington, N. C.
Thomas Laufer, Student Trainee, Raleigh
James W. Lish, Meteorological Technician, Salt Lake City
George U. Luke, Electronic Maintenance Technician, Wake Island
Monte M. Mastick, Student Trainee, Portland, Ore.
Martin H. Michels, Meteorological Technician, Philadelphia
Jack J. Mogul, Teletypist, Miami
Carrell M. Parker, Accounting & Fiscal Clerk, Central Office
Carmen M. Pedulla, Clerk-Stenographer, New York
Francis W. Poole, Meteorologist, Minneapolis
William K. Poust, Meteorological Technician, Central Office
Howard F. Rhodewalt, Meteorological Technician, San Francisco
Kenneth B. Seal, Meteorological Technician, Great Falls
Gordon D. Shadoan, Placement Specialist, Central Office
Henry F. Silsby, Jr., Meteorologist, San Juan
John L. Simpson, Meteorologist, Laredo
Thelma M. Smith, Mathematician, Central Office
Clyde W. Spearman, Meteorological Technician, Charleston, S.C.
Robert E. Spycher, Student Trainee, Miami
Stuart Marvin Stern, Meteorological Technician, Central Office
Oliver C. Stokes, Jr., Electronic Engineer, Central Office
Ina Mae Stolte, Meteorological Technician, Denver
Hugh M. Stone, Meteorologist, Pendleton, Ore.
Frank J. Swekosky, Student Trainee, St. Louis
John Milton Swenson, Electronic Engineer, Central Office
Santo J. Tavormina, General Engineer, New York
Yvonne Marie Thomas, Clerk-Typist, Central Office
Roscoe E. Thompson, Mathematician, Central Office

New MIC's Selected For Two Stations

Ottis C. Bobbitt, the new Meteorologist in Charge at the Weather Bureau Airport Station in San Angelo, Texas, has been serving as Principal Assistant at Dodge City since March. During his 31 years with the Bureau, Mr. Bobbitt has been stationed at Brownsville, San Antonio, Washington National Airport, Anchorage, and Salt Lake City. He served in the Facilities and Observations Section of the Salt Lake City Regional Office from 1950 to 1961. Mr. Bobbitt attended the University of Texas and graduated from Sam Houston Teachers College. Before entering the Weather Bureau, he taught physics and mathematics in a Texas high school.

Leroy W. Stankewitz is the new Meteorologist in Charge at the Weather Bureau Airport Station in Roswell, New Mexico. Mr. Stankewitz attended Kilgore Junior College and graduated from Hardin Simmons University. After serving as a forecaster in the Army Air Force, he entered the Weather Bureau in 1946 at Abilene, Texas. He remained at Abilene until 1960, when he became an Aviation Forecaster at Fort Worth.

AP Thanks Weather Bureau For Service C Forecasts

On July 10, 1961, the Weather Bureau began sending the forecasts on Service C without contractions. On the day of the changeover, John A. Aspinwall, the Radio - Television News Editor of the New York General Office of the Associated Press, wrote the following letter to the New York Weather Bureau Office:

"We noted with great satisfaction an important innovation on the Weather Bureau circuit this morning--i.e. the transmission

Pilotless Aircraft Tracked by Radar During Wild Flight

Radar observers at the Burlington, Iowa, Weather Bureau Airport Station performed an unusual public service on September 8, when they tracked a pilotless aircraft for most of its two-hour flight. The radarmen were able to pick up the small L-16 aircraft on their equipment while it was still over the airport, and directed Iowa State Highway Patrol planes to it. The L-16 finally came to earth in an Illinois bean field 30 miles northeast of Burlington without causing injury.

The airplane began its wild flight when the would-be pilot spun its propeller and was surprised to see the engine start up at high speed. He hung on to the plane, trying to hold it back. The plane described erratic circles on the airport grass as its pilot desperately tried to clamber into the cabin and turn off the ignition.

But he had to let go after the airplane dragged him to the concrete runway, severely skinning his right side. "It took off like someone was flying it, almost, and it started climbing," the pilot said.

Burlington's mayor and the civil defense director sent a letter of thanks to the Weather Bureau Airport Station for keeping the pilotless aircraft under surveillance.

Welcome to the Weather Bureau (continued)

James W. Trout, Meteorologist, Central Office
William Wada, Electronic Accounting Machine Program Supervisor, San Francisco
Harold A. Ward, Meteorologist, San Juan
William O. Warren, Electronic Maintenance Technician, New Orleans
Barbara A. Watkins, Clerk-Stenographer, Boston
Ronald P. Willett, Management Analyst, Central Office
Albert F. Williams, Stock Handler, Central Office
Truman J. Wilson, Meteorological Technician, North Platte
Francis J. Winninghoff, Meteorologist, Central Office
Joseph A. Zak, Student Trainee, Philadelphia

Transfers

	From	To
Luis Aldaz	Central Office	Antarctica
Ronald M. Aranita	Wake Island	Honolulu
A.B. Arnett, Jr.	Miami	Kansas City
John C. Ballard	Atlanta	Seoul, Korea
Guy A. Barkley	Little Rock	Knoxville
Joseph M. Bauman	Eniwetok	Kwajalein
Carl R. Bohanan	Athens, Ga.	Little Rock
Donald W. Bowyer	Central Office	Antarctica
Philip A. Calabrese	Anchorage	Central Office
Thomas A. Carey	Salt Lake City	Los Angeles
Ray R. Casada	Nashville	Rome, Ga.
Charley Chapa	Albuquerque	Brownsville
William M. Davis	Raleigh	Columbia, S.C.
Robert R. Dickson	Nashville	Central Office
Louis M. Durr, Jr.	Galveston	Baton Rouge
Nathan Ellis	Philadelphia	Miami
Keith L. Ewing	Great Falls	Pendleton, Ore.
William A. Gribble	Boston	Norfolk
Robert S. Ingram	Sterling, Va.	Burlington, Vt.
Charles B. King	Jackson, Miss.	Wallops Island
Hugo V. Lehrer	Oklahoma City	Asheville
Sanford R. Miller	Bismarck	Kansas City
John T. Moseley	Midland	Baton Rouge
Forrest D. Paxton	Long Beach	Resolute Bay, NWT
Monte F. Poindexter	Central Office	Isachsen, NWT
Daniel A. Schlichtig	Los Angeles	Burbank
Ronald P. Stagno	Houston	Brownsville
Thomas T. Tatekawa	Eniwetok	Kwajalein
Gifford H. Turner	Brownsville	Galveston
Harold Q. Van Dyke, Jr.	Tallahassee	Central Office
Nathan S. Waldrop	El Paso	Oklahoma City
William R. Wright	Augusta, Ga.	OCDM Main Relocation Site
David Lee Yingling	San Francisco	Medford, Ore.

of the early morning state-by-state forecasts in fully written-out form. Please accept our sincere thanks for this very great improvement in your teletype service.

"Abandonment of the old 'short-hand' form of transmission has taken a tremendous load off the shoulders of our deskmen, who heretofore have had to do a laborious job of transcription prior to relaying the forecasts on our national broadcast wire. More important still is the fact that the new system has had the end result of enabling us to deliver the forecasts more quickly to the 2,200 stations which are served by our teletype network.

"I know that all of these stations are as gratified as we are by this very important forward step."

RETIREMENTS

Sidney Aaronson

Sidney Aaronson, a Clerk in the Office of Climatology, retired on October 17. Mr. Aaronson came to the Weather Bureau in 1920 as a Messenger in the Telegraph Division. He has worked in the Central Office throughout his career and has been with the Office of Climatology since 1947. Mr. Aaronson attended George Washington University and served in the U.S. Army Air Corps during World War II. His address is Park Lane Apartments, 2025 Eye Street, N.W., Washington 6, D.C.

Gayle Scott Adams

Gayle Scott Adams, Meteorologist in Charge of the Weather Bureau Airport Station in San Angelo, Texas, retired on October 24 after 34 years with the Weather Bureau. Mr. Adams attended Rice Institute and became a Junior Observer at Dallas in 1927. He was later stationed at Groesbeck, Texas, and served at Houston for 19 years. Since 1947, he has been MIC at San Angelo. Mr. Adams' address is 222 North Jackson Street, San Angelo, Texas.

Harry F. Choun

Harry F. Choun, a Meteorologist at the Kansas City Weather Bureau Office, retired on October 13. Mr. Choun entered the Weather Bureau nearly 41 years ago and was stationed at St. Joseph, Mo., Wagon Wheel Gap, Colo., Del Rio, Tex., Houston, Tex., Madison, Wis., and Denver before moving to Kansas City in 1940. At Kansas City, he has served as Hydrologist, Airway Forecaster, FAWS Supervisor, and Technical Assistant. During World War II, he was an aerological officer in the U.S. Navy. Mr. Choun's address is 6900 West 66th Terrace, Overland Park, Kansas.

Lewis E. Johnson

Lewis E. Johnson retired on September 9 after nearly 35 years of service in the Central Office Printing Section. Mr. Johnson attended the Baltimore School of Printing and came to the Weather Bureau in 1925 as an Apprentice Lithographer. From 1953 until his retirement, he was Superintendent of the Printing Section. Mr. Johnson's address is 2815 Bayshore Gardens Parkway, Bradenton, Florida.

Fern D. LeBlanc

Fern D. LeBlanc, a Secretary in the Instrumental Engineering Division, retired on September 19. Before entering the Weather Bureau, Mrs. LeBlanc was employed as a nurse and secretary. From 1948 to 1955, she served in the Synoptic Reports and Forecasts Division. She transferred to IED in 1955 and remained there until her retirement. Mrs. LeBlanc's address is 90 Aina Street, Hilo, Hawaii.

James B. Lyle

James B. Lyle, a Weather Data Editor in the Forecasts and Synoptic Reports Division, retired on September 30, 1961. After seven years with the Postal Telegraph Company, Mr. Lyle entered the Weather Bureau as a Telegrapher in 1927. All of his service has been in the Washington area, in the Central Office and at Washington National Airport. Mr. Lyle's address is Calvert Beach, St. Leonard, Maryland.

John B. Markham

John B. Markham, a Meteorological Technician at the Weather Bureau Airport Station in Roseburg, Oregon, retired on October 23, 1961. Mr. Markham is a graduate of Idaho State College. From 1943 to 1946, he was a weather observer in the U.S. Air Force. He entered the Weather Bureau in 1947 at Pueblo, Colorado, and later served at Lander, Wyoming; Tatoosh Island; Ely, Nevada; Sandberg, California; Milford, Utah; and Meacham, Oregon, where he was Official in Charge from 1956 to 1960. Mr. Markham's address is 208 South Rural Drive, Monterey Park, California.

Suggestion Award Winners

Laurel Dahlin	WBAS, Rockford	$50
Herbert Bomalaski	WBAS, Green Bay	25
Albert Comiskey	WBAS, Anchorage	25
Donald Liddy	WBAS, Washington, D.C.	25
Eugene Masson	NWRC, Asheville	25
Raymond Powell	WBAS, Indianapolis	25
Wilson Tschiffely	NWRC, Asheville	25
Perry Wood	DMO, Kansas City	25
Sidney Aaronson	Climat, Central Office	15
Robert Butler	WBO, Pittsburgh	15
William Chapman	WBAS, Des Moines	15
William Clarkson	WBAS, Colorado Springs	15
Myron Kerner	WBO, Guam	15
Harlan Rinard	WBAS, Eugene, Ore.	15
Marie Stroh	WBO, Lincoln	15
Thomas Weitz	WBAS, Burbank	15
Milton Werbin	WBAS, N.Y. Int'l Airport	15
Gemo Yakubovsky	WBAS, Los Angeles	15
Charles McCain	WBAS, Casper, Wyo.	10
GROUP AWARDS:		
George Brancato	WBAS, St. Louis	25
Robert Dickson	RFC, St. Louis	
Harold Crutcher	NWRC, Asheville	30
Mary Warren	NWRC, Asheville	

Meteorological Readings

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate. For more introductory information, see TOPICS May 1957. When submitting answer cards, please mark envelope in lower left corner: "Meteorological Readings."

Assignment No. LII : This article deals with the probable cause of thunderstorms which ignited many forest fires in Idaho and Montana and discusses variations between number of lightning strikes in different types of thunderstorms. "High-Level Thunderstorms of July 31-August 1, 1959," by DeVer Colson, Monthly Weather Review, August 1960, pp. 279-285.

QUESTIONNAIRE

Col. 61 The high-level thunderstorms of July 31-August 1, 1959, over Montana and northern Idaho:
1. were associated with the passage of an upper cold front
2. were associated with the deepening of a cold low pressure area off the northwestern coast
3. were triggered off by increase of surface moisture moving in from the south
4. can be best explained by the increase of moisture and instability in the upper layers

Col. 62 The series of charts in figure 5 shows:
1. the passage of an upper trough
2. no regular changes at all
3. decided cyclogenesis over southeastern Idaho
4. general height increases followed by general height decreases

Col. 63 High-level thunderstorms:
1. may be initiated by passage of an upper cold front and usually give copious amounts of precipitation
2. occur with dry stable air in upper layers and therefore yield little precipitation
3. may be caused by advection of cold air aloft and usually very little precipitation reaches the ground
4. are easily distinguishable from other types of thunderstorms

Col. 64 Each set of thunderstorms:
1. developed and spread in a regular fashion at fairly regularly spaced intervals of time
2. developed rapidly and moved from the northeast
3. developed at irregular times over wide areas and generally moved with the wind circulation
4. showed less precipitation as time wore on

Col. 65 The radiosonde reports for Boise and Spokane, figures 7 and 8, show evidence of:
1. more moisture and less stability in upper levels in afternoon of July 31st at Boise and morning of August 1st at Spokane
2. decided moisture increase at lower levels at both stations
3. cooling at all levels, but more so aloft
4. widespread increase in vorticity, especially during the second day

Col. 66 The dry fuel conditions that had been built up prior to the thunderstorm period discussed in this paper can be attributed to: (check one or more)
1. persistent high pressure ridge between 700 and 850 mb
2. a weakening of the deep cold low pressure usually present off the northwest coast
3. the isolated character of the prevailing storm activity as shown by the occurrence of only 16 percent of the normal number of thunderstorms
4. the very dry character of the last half of July which offset normal rainfall in the first half

Col. 67 According to figure 10:
1. the chances of both lightning strikes and of thunderstorms are greater with increasing precipitable water and decreasing instability
2. lightning strikes are shown to be greater with larger values of precipitable water and decreasing stability
3. lightning strikes are always more numerous than thunderstorm occurrences
4. chances of thunderstorms decrease with increasing instability

Col. 68 The ability of lightning strikes to produce fires is affected by the following: (check all correct answers)
1. whether or not precipitation accompanies the strikes
2. how wet the fuel is
3. whether the strike is cloud-to-ground or vice-versa
4. the relative height of the base of the lightning-producing clouds

Col. 69 In table 1, it is clear that:
1. a seasonal trend in the number of lightning strikes exists
2. 262 lightning strikes occurred July 31 and 694 on August 1
3. even on the 25 days with the greatest number of strikes, the daily range in the number of strikes is great
4. strikes from high - level thunderstorms are of no consequence whatsoever

Col. 70 Which of the following statements are true?
1. Most of the storm clouds on July 31st had a vertical growth of less than 10,000 feet
2. Lightning from these thunderstorms caused more than 200 fires during a 2-day period
3. The greatest number of lightning strikes were reported with the northern set of storms
4. All the thunderstorms developed in the afternoon, local time

46 Years Ago

Headaches of a Weather Observer

In the early years of the Weather Bureau, the slightest error in observations could have grave results indeed. On September 16, 1915, the Chief of the Weather Bureau wrote the following letter to an observer in the "sticks."

Sir:

On August 12, 1915, you made an error in the a.m. barometer reading, it being telegraphed as 29.82 when the correct reading was 29.92. This is the second error of the same character made by you during the past six months.

It is essential that the observation work of the Weather Bureau be maintained at a high standard and especially is this true of barometer readings upon which the forecasters must depend in the preparation of weather forecasts and warnings. An error of one-tenth of an inch is serious and might lead to unfortunate results.

You are hereby admonished to exercise more care in your observation work and cautioned that in the event of another error of the character of that made by you on August 12, 1915, the provisions of Paragraph 401 of the Station Regulations will be applied in your case.

Respectfully,

C.F. Marvin
Chief of Bureau

Five days later, the penitent observer replied to the Chief.

Sir:

Referring to your letter of admonition, dated September 16, 1915, relative to errors in barometer readings, I have the honor to state that I was exceedingly chagrined when I found that I had made the error in my barometer reading on August 12, 1915.

While I do not offer this as an excuse for my error, I wish to say that I was suffering from a severe bilious headache at the time, which possibly was the cause for my inaccuracy on this occasion.

I have always taken considerable pride in the fact that I have made comparatively few mistakes in taking and enciphering observations, and I feel keenly humiliated that I should make one of this character. I beg to assure you that I am carefully guarding against future errors in my observation work.

I fully realize the great importance of correct observations, also the possible effects that incorrect readings might have in the preparation of forecasts and warnings.

By a system of checking I am now using, I sincerely hope I may be able, in the future, to eliminate the occurrence of errors similar to the above mentioned.

Very respectfully,

Assistant Observer

New Guides to Ethical Conduct Will Be Distributed Soon

New guidelines will soon be issued for ethical conduct with respect to such matters as outside employment, holding a financial interest in a firm if one's Bureau job involves purchasing from or contracting with the firm, accepting gifts from persons or firms with whom the Bureau has official relationships, etc.

These guidelines will appear in a revised Chapter VII of the Employee Handbook. Weather Bureau Manual Chapter I-D-82 has also been revised to include them and will soon be distributed to all offices. Every employee should read each of these documents carefully and consider whether any of his interests and activities are, or might be considered to be, in conflict with the regulations and principles presented therein.

Superior Performance Awards

O. Kenneth Anderson,
WBAS, Louisville
Laurel Dahlin,
WBAS, Rockford
Gennaro D'Auria,
WBAS, Hartford
Clyde Downes,
WBAS, Fort Wayne
Sam Duke,
WBAS, Wilmington
Darrel Foat,
OMR, Central Office
Keith Gregory,
WBAS, St. Louis
Harold Lowman,
WBAS, Annette
Roland Raetz,
RFC, Tulsa
Mary Rutherford,
RAO, Kansas City
William Sapp,
PWP, San Francisco
Lois Weddle,
WBAS, Anchorage
John Yates,
RFC, Tulsa

Length of Service Awards

35-Year Awards

John W. Hayes,
WBAS, Fort Myers
William B. Drawbaugh,
WBAS, Allentown

30-Year Awards

Graham L. Allen,
WBO, New Orleans
Zeal Borem,
WBO, Los Angeles

25-Year Awards

Roger A. Allen,
OMR, Central Office
John J. Davis,
Personnel, Central Office
Elmer R. Nelson,
Hydro, Central Office
Tor J. Nordenson,
Hydro, Central Office
Robert H. Sourbeer,
NHRP, Miami
Ernest B. Williams,
WBAS, Detroit

15-Year Awards

Vivian C. Bowles,
NSSP, Kansas City
Jack K. Brown,
WBAS, Nashville
Robert E. Burwell,
WBAS, Columbus
Willard V. Compton,
IED, Central Office
Leon G. Conover,
WBAS, Bismarck
Harry W. Diamond,
RAO, New York
Neal W. Hughes,
WBAS, Concord, N.H.
Jack B. Icenhower,
NWRC, Asheville
Leland G. McCollough,
F&SR, Central Office
William M. Mills,
NWRC, Asheville
Raymond W. Mosher,
AWP, Boston
Fred E. Ploeger,
WBAS, Norfolk
Anita M. Poole,
WBAS, San Francisco
Wallace W. Reed,
WBAS, Albuquerque
Andrew J. Treat
WBAS, Norfolk
Pauline R. West,
NWRC, Asheville
Warren K. Wilhelm,
NMC, Central Office

Forecasters' Forum:

Predicting Snow Accumulation

Forecasters are keenly aware of the extreme difficulties in the forecasting of a threatening snowstorm situation. With temperatures expected to hover around the freezing mark, the problem is made especially acute. Reliance on strict categorical forecasts in such situations often requires frequent amending of the forecast. Such a sequence all too often fixes in the mind of the public the opinion that "even the forecaster does not know what is going to happen." As presently constituted, only a very small percentage of the recipients of Weather Bureau forecasts are really at all aware of the dilemmas which face the forecasters. This is quite understandable when we consider the fact that, by and large, the recipients of the forecasts are not given the benefit of knowing the alternatives which essentially remain locked in the forecaster's mind.

I believe that many mutually beneficial results would come from the addition of appropriate portions of this "locked up" information to the categorical (or most probable) portion of the forecast. For one thing, the receiving public would gradually become more appreciate of the forecaster's problems. Perhaps more important and specifically in regard to a threatening major snowstorm situation, people receiving the forecast would be better prepared to make decisions if, in addition to knowing the most probable sequence of events, they also knew something of the most severe conditions the forecaster could see developing.

Historically, many major snowstorms develop and intensify so rapidly that it becomes a difficult task for the forecaster even to keep his predicted snow amounts ahead of the actual accumulation. All too often, such storms just do not behave in a "categorical" manner. Invariably, by the time they "show their true colors" it is already too late to adequately warn areas in the path of the storm. If, while a storm is in an incipient or developing stage, an indication of the more severe possibilities were included in the issued forecast such storms would no longer "strike without any warning."

The following are a few examples of phrases that might be added to the categorical forecast to take care of the alternate possibilities of more (or less) severe conditions. Basically this would involve wording appropriately for public consumption the essence of the material in the guidance material regarding alternate possibilities.

1. This developing storm has similarities to types that in the past have, on occasion, resulted in considerably heavier snow accumulations.

2. If the temperature should remain a few degrees lower, several inches of snow are a distinct possibility.

3. There is a possibility that this storm may pass a little farther to the north. This would result in less snow accumulation.

If this type of information were included as part of the forecast the public would no longer need to react with shocking surprise and consternation to a change in the forecast--they would have been prepared for the change by the wording of the previous forecast.

F.K. Schwarz
Hydrometeorological Section

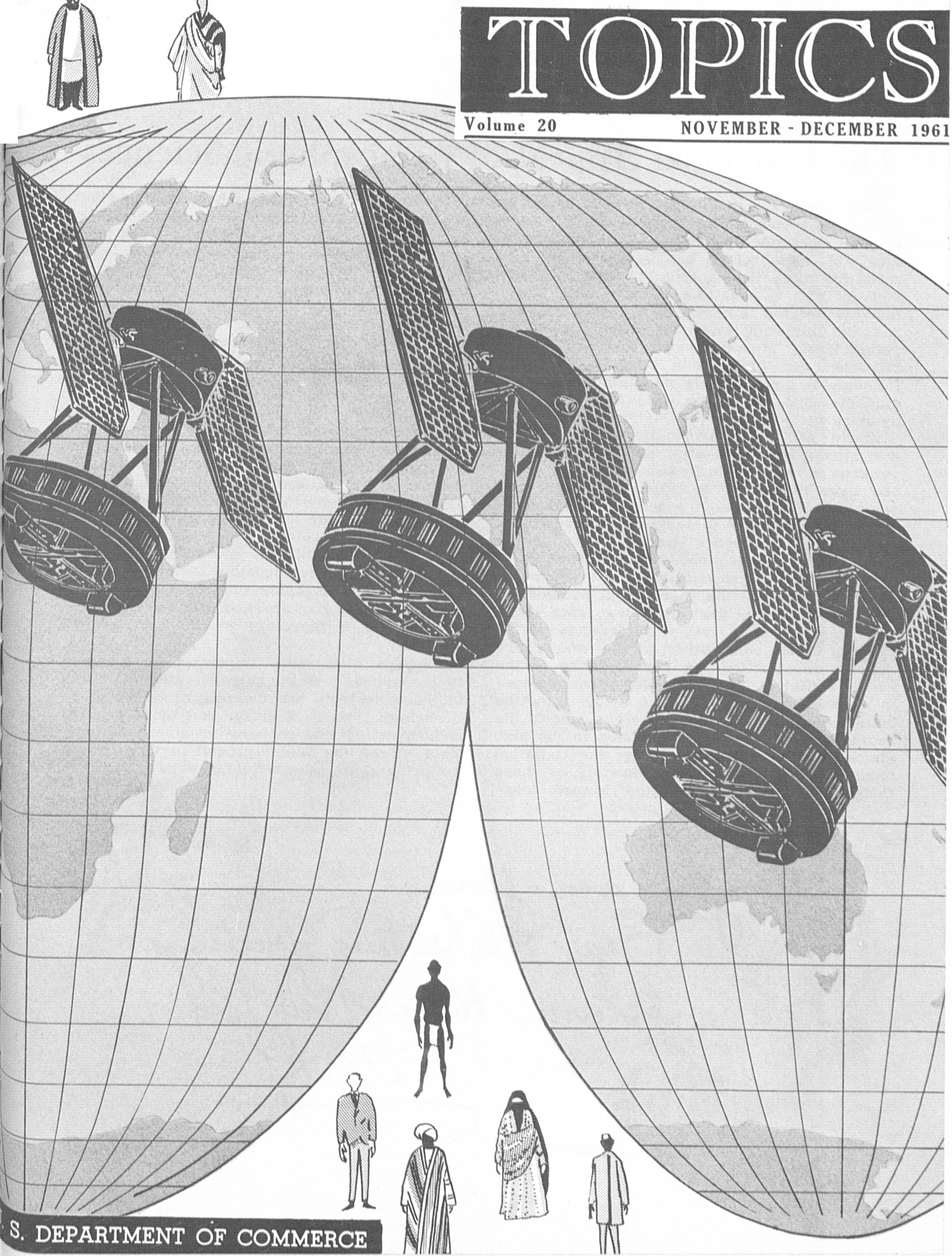
Volume 20 OCTOBER 1961 Number 10

CONTENTS

WEATHER BUREAU TOPICS is published monthly to inform all employees about newsworthy operations and work programs of the Bureau; to give background on instructions; to carry news of new personnel assignments, retirements, deaths, and similar information about employees; and to serve as a medium through which ideas and views may be exchanged to promote efficiency and teamwork in attaining our common goals. While the contents, unless otherwise specified, reflect the Central Office viewpoint, they are not instructions but are presented for information. Opinions, discussions or comments by readers are invited; they should be marked for the attention of the Editor, TOPICS. WEATHER BUREAU TOPICS is distributed for official use only.

TOPICS

Volume 20 NOVEMBER - DECEMBER 1961



S. DEPARTMENT OF COMMERCE

Editorial

The Universal Appeal of Atmospheric Sciences

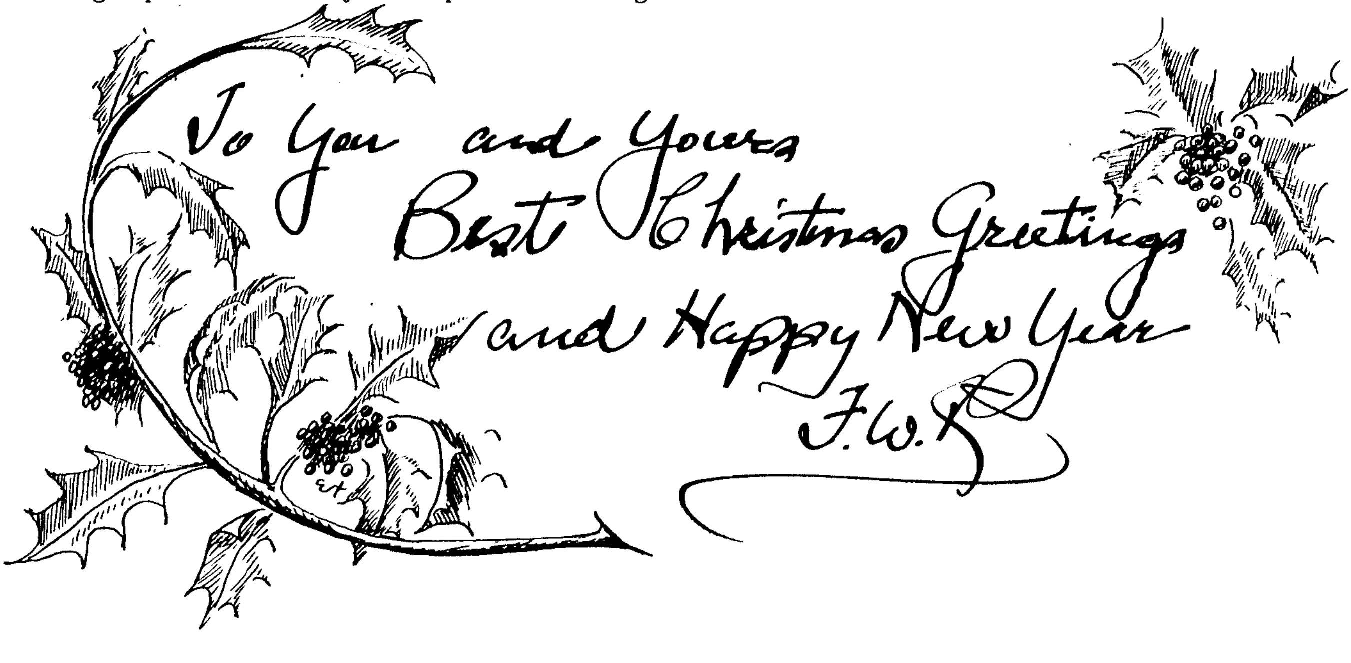
New discoveries in science lead not only to new and unexpected applications but also to new light on old truths. The "global nature" of meteorology has been well recognized for more than a century. But the findings of the International Geophysical Year, the discoveries already made by satellites, and the hints of vast new knowledge to be gained from comprehensive study of TIROS radiation and cloud data point to the need for review and probable modification of conclusions that for years have been regarded by many meteorologists as "truths."

Above all, the universality of interest in the atmospheric sciences and the universal patterns revealed in many atmospheric phenomena have been re-emphasized in recent research. These can be seen, for example, in the general circulation and its relationship to the transport and diffusion of the many contaminants which modern industry is pouring into the atmosphere in ever-increasing amounts. Do the gases from combustion of fuels and the dust particles from many activities on the earth's surface result in changes in the composition of the atmosphere and its reaction on the heat balance of the earth sufficient to bring long-term changes in climate? Do fluctuations in the radiation belts beyond the gaseous envelope modify the ozone content or other molecules in the high atmosphere in ways that change the radiation balance? Would an understanding of these things provide a major step toward long-range forecasting? Do they have an important bearing on the storminess of the weather? Or on abnormally cold outbreaks from polar regions? These questions are of interest to man and to his economic and social activities throughout the world. Until recently, the answers have seemed far beyond reach. Now the new possibilities for probing the atmosphere and the surrounding space have probably brought many of these unknowns closer to understanding.

In a resolution recently presented to the United Nations by the United States, it has been proposed that all peoples cooperate in the development of outer space possibilities for peaceful uses and that studies of the atmosphere be focused on solving some of the problems of meteorology and extended weather forecasting. The supporting statements pertaining to the resolution refer also to development of the possibilities of weather modification--whatever those possibilities may be. The attention and emphasis now being placed on these subjects give promise of the greater importance of meteorology and the atmospheric sciences.

Perhaps even more important for mankind is the emphasis on the common interest of man in these subjects and the role of meteorology in bringing about a closer and more general understanding and cooperation among nations. This offers the meteorologist further reason for pride in his chosen field of work.

F.W.R.



Topigrams

Washington, D.C.
December, 1961

On December 11, the Political Committee of the United Nations General Assembly unanimously approved a resolution calling for increased cooperation in "furthering the peaceful use of outer space." The resolution recommends that all member states work with the WMO in weather research and analysis, in order to advance meteorological knowledge and perhaps develop techniques of modifying the weather. It asks all countries to furnish to a central registry information on any objects launched into space. The resolution was sponsored by the United States, Australia, Canada, and Italy. If the proposal is approved by the General Assembly it will be referred to the WMO, which will prepare a report for consideration by the U.N. Economic and Social Council.

The Third Session of the Commission for Synoptic Meteorology will be held in Washington from March 26 to April 20, 1962. Arrangements are being made with the State Department for conference facilities, including interpreters, translators, and documentation for the plenary sessions and the three Working Committees.

"A Method of Preparing Weather Forecasts for 3 to 7 Days," by Y.B. Khrabov, is the second book to be translated for the Weather Bureau under Public Law 480 (see TOPICS, October 1961, page 176). Copies of the translation will soon be distributed to Central Office divisions and to most field forecast offices.

The continuous FM weather broadcasts at Providence, Rhode Island, (see TOPICS, September 1960, page 147) will be continued through October 1962. The experimental program is being evaluated to determine the feasibility of establishing such a service on a nationwide basis.

A teletypewriter loop in the mid-South, part of the Bureau's expanded agricultural meteorological program, was activated on October 1, 1961. The network gives specialized agricultural weather information to radio and TV stations and newspapers for mass dissemination in the Bootheel area of Missouri, eastern and southern Arkansas, western Tennessee, northern Mississippi, and northeast Louisiana. With a pilot project already operating in the Mississippi-Louisiana Delta, the agricultural program began this fall in three farming regions--the mid-South; an area including southeast Alabama, southwest Georgia, and part of northern Florida; and the lower Rio Grande Valley--and will begin in western lower Michigan late this winter.

Workshop Participants

Argentina
Wrondesco Almejun

Brazil
Robert F. Caracciolo
Roberto V. Pereira

Canada
Paul Johns
James A.W. McCulloch

Republic of China
Moon-Heng Pi

Denmark
Hans Sondergaard Buch

El Salvador
Helmut Lessman
Albert Pallmann

Finland
Aili Nurminen

France
R. Jalu
A. Villevielle

Federal Republic of Germany
Fritz Brandt
Werner Buschner

Honduras
Virgilio Torres Molinero

Iran
Jalal Tabatabai Vakili

Ireland
James M. McMonagle

Israel
Lothar Ben-Oz
Michael Levi

Italy
Sabino Palmieri
Marco Piloni

Netherlands
F.H. Schmidt
C.G. van der Ham

Netherlands Antilles
A. Bruinenberg

New Zealand
J.F. Gabites

Nigeria
Godwin O. Patrick

Norway
Jack Nordo

Pakistan
Muhamad Rahmatullah

Portugal
Francisco Dos Santos Regencio Alves

Republic of South Africa
D.R. Masson

Sudan
G. Mustafa

Thailand
Thaworn Pongsapipat

United Arab Republic
M.H. Gidamy

United Kingdom
C.J. Boyden
D.G. James

West Indies Federation
Michael E. Nancoo
G.M.D. Rudder

Meteorologists From 27 Nations Study U.S. Satellite Program

On Monday, November 13, 37 meteorologists from 27 countries gathered in Washington for the opening of the International Meteorological Satellite Workshop. The ten-day workshop was organized jointly by the National Aeronautics and Space Administration and the United States Weather Bureau to inform meteorologists everywhere about the techniques for using satellite data. Early in August, invitations were extended to the meteorological services of more than one hundred nations.

The workshop had the cooperation and endorsement of the World Meteorological Organization, the International Union of Geodesy and Geophysics, the Committee on Space Research, the International Civil Aviation Organization, the American Meteorological Society, and the National Academy of Sciences. Several of these organizations sent observers: Dr. Kaarle Langlo represented WMO; U. Schwarz, ICAO; John R. Sievers, National Academy of Sciences; Dr. F.H. Schmidt, IUGG; and Dr. Harry Wexler, COSPAR.

In the opening remarks on the first day of the workshop, it was announced that the observations and data obtained by meteorological satellites launched by the United States would be published for use of all peoples and that weather satellites were expected to be in operation in the near future with continuity that would provide data for regular daily use in weather forecasting. "Working together," it was pointed out, "we can dedicate our efforts to an early realization of the use of space for peaceful and practical benefits for all mankind whose activities everywhere are so dependent on weather."

Comparing this international meeting with one of the first international meetings of meteorologists organized by Matthew Fontaine Maury about a hundred years ago, it was stated that space satellites will provide worldwide weather observations to an extent undreamed of a century ago and that the present advances may well mark the beginning of great new developments in meteorology.

Among the speakers at the opening ceremonies were Mr. James E. Webb, Administrator of NASA, and Dr. Harry Wexler, who spoke for the Weather Bureau in the absence of the Chief of Bureau who was attending meteorological meetings in another part of the country.

The first two days of the workshop were devoted to a series of short lectures by NASA and Weather Bureau scientists. The talks covered the TIROS satellites and their instrumentation, the data acquisition system, picture gridding and interpretation, use of TIROS data in current synoptic analysis, research results, and the plans for future meteorological satellite systems.

On Wednesday and Thursday, November 15 and 16, the participants visited several NASA and Weather Bureau installations, including Goddard Space Flight Center, the TIROS data acquisition station at Wallops Station, Virginia, and the Meteorological Satellite Laboratory and the National Meteorological Center in Suitland, Maryland.

Three days of laboratory sessions followed, in which the visiting meteorologists used real satellite data to prepare weather analyses. In this way, they gained practical experience in the use of satellite data distributed through international meteorological channels.

On the final day of the conference, the participants had an opportunity to discuss their special problems with scientific staff from the Weather Bureau and the National Aeronautics and Space Administration.

TIROS Pictures Now Poor; Satellite's Photographs Aided Many Nations

Photographs received from TIROS III have gradually deteriorated in quality. Because of the difficulty of determining the character of cloudiness over land areas, nephanalyses during October were restricted to ocean areas. Since October 30, no nephanalyses have been transmitted to field stations.

The data acquisition station at Wallops Island, Virginia, will be shut down for a short time beginning December 11 to convert to new frequencies in preparation for the launching of TIROS IV. During this period, the west coast readout station will continue to interrogate TIROS II and III.

November 23 marked the first anniversary of the launching of TIROS II. The photographs received from this satellite are good, considering the age of the equipment which was designed for an operational lifetime of about three months.

When the third TIROS was launched by the National Aeronautics and Space Administration on July 12 of this year, it was called the "Hurricane Hunter Satellite." Living up to its name, TIROS III photographed 18 tropical storms in all stages of development.

On September 10, the satellite made meteorological history by discovering Hurricane Esther in its formative stages. Altogether five hurricanes and one tropical storm were seen by TIROS III in the Atlantic. Two hurricanes and a tropical storm were photographed in the eastern Pacific. Nine typhoons -- from Kathy through Tilda--were followed in the central and western Pacific.

Fifty advisories on these storms and on other significant weather developments were sent by telephone, telegraph, or radio to Japan, the Philippines, Mexico, Hong Kong, Formosa, and Guam, as well as to Honolulu, San Francisco, Miami, New Orleans, and San Juan. In this way, the Weather Bureau has used the satellite information to provide warnings of unusual or previously undetected weather to all nations likely to be affected.

On 17 days, information revealed by the satellite photographs led to revision of the surface and upper-air weather charts prepared at the National Meteorological Center.

WMO Official Thanks NASA and WB; Terms Workshop 'Highly Successful'

At one of the last sessions of the International Meteorological Satellite Workshop, Dr. Kaarle Langlo, Chief of the World Meteorological Organization's Technical Division, made the following address to the participants, thanking the United States, the National Aeronautics and Space Administration, and the Weather Bureau for organizing the workshop:

Due to other commitments, I have unfortunately not been able to be with you the last few days and, since I am leaving for Europe tomorrow, I am glad to have this opportunity to speak to you on a matter which I believe every participant from whatever country or organization feels in the same way I do.

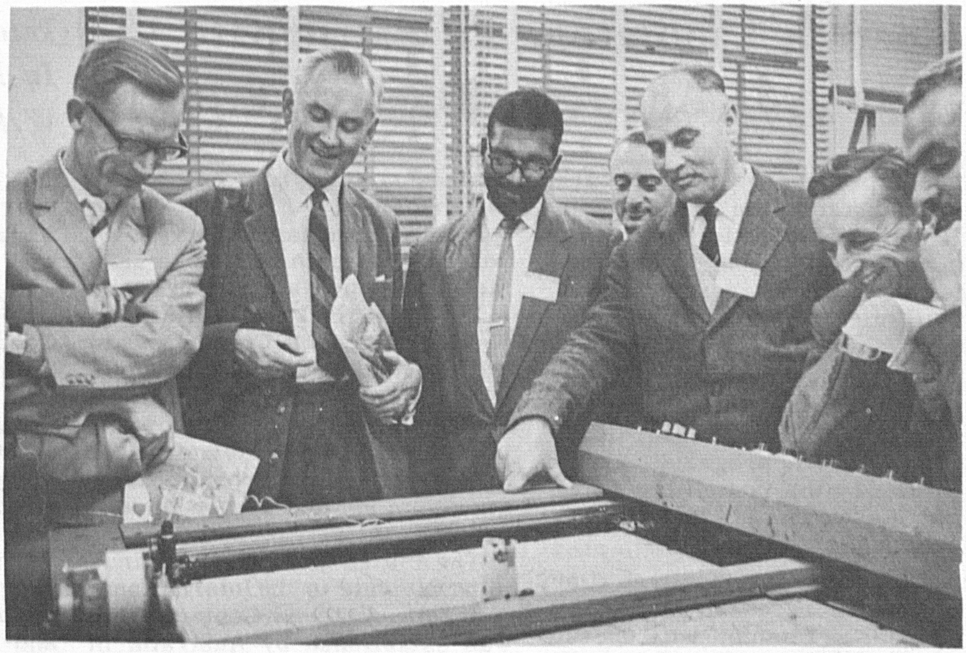
I am not only speaking on behalf of the World Meteorological Organization and of the International Civil Aviation Organization, but I am also speaking on behalf of all meteorologists who wish to see the science of meteorology be given its proper place and recognition among the sciences and who do not wish to see the development of meteorology unduly hampered by its long traditions.

During the past days, we have been listening to well-prepared, well-presented, and very interesting lectures. We have been instructed in how to use satellite data in practice; we have been carried by planes and buses to visit important installations concerned with meteorological satellites and rockets. We are all very impressed with what we have seen and heard, and we all wish to express our warm gratitude to everyone who has been concerned with these arrangements.

But we also wish to say more. We have had the opportunity of participating in free discussions of the problems involved in using satellite data; we have perhaps given the impression that we wish more to be done or we wanted other experiments to be carried out. I should like to make it crystal clear that such comments should not in any way overshadow our main sentiment, that is, our warm gratitude and appreciation to the United States, to the National Aeronautics and Space Administration, and to the Weather Bureau for the tremendous efforts that have already been made to advance the meteorological science to the benefit of all countries.

As you know, the activities of the World Meteorological Organization are to a large extent dependent on the efforts made by its Member States, and it is indeed a pleasure for me to express once again our sincere thanks to the United States for what is has done in the field of satellite meteorology, measured not only in dollars and personnel but in the initiative and enthusiasm which cannot fail to bring our science forward. I would be grateful if the representatives of our host country present here would convey these notes of thanks to all concerned with the organization of this highly successful workshop on satellite meteorology.

The Weather Bureau's data plotter fascinated the visiting meteorologists.



Workshop photographs by the National Aeronautics and Space Administration.

At Goddard Space Flight Center, satellite models were displayed.

Floating Laboratory To Participate In 1962 Antarctic Research Program

The present season of research in Antarctica, the first since the 12-nation Antarctic Treaty took effect, is the largest and most far-reaching ever undertaken by the United States.

The U.S. Antarctic Research Program is funded and administered by the National Science Foundation and is coordinated with Antarctic programs of other nations by the Committee on Polar Research of the National Academy of Sciences.

This year for the first time, a floating research laboratory, the USNS Eltanin, will operate in Antarctic waters. The Eltanin, an ice-strengthened ship suited for operations in polar seas, will carry scientists of many disciplines, including oceanography, meteorology, physics of the upper atmosphere, marine biology, and submarine geology.

With more than 30 scientists aboard, the Eltanin will be the largest U.S. scientific station in Antarctica. It is expected to leave on its first cruise in January and operate for ten months of the year, with individual cruises lasting from one to two months.

Weather Bureau observers aboard the Eltanin will make surface and upper-air observations to be forwarded to the National Weather Records Center and to the International Antarctic Analysis Center; energy balance determinations; precipitation measurements; ozone determination; and sampling for carbon dioxide, strontium 90, and carbon 14 concentrations.

The United States will continue to participate in the International Antarctic Analysis Center, which was established by Australia in 1959 to analyze and study weather patterns in the Southern Hemisphere south of the 30th parallel. The work of the IAAC adds to our basic understanding of Antarctic circulation and its relation to the entire atmosphere.

The National Science Foundation grants also provide for the continuation of the meteorological programs at Byrd, Ellsworth, Hallett, Pole, and Wilkes Stations, and of the study of atmospheric-oceanic-glaciologic interaction in and around Antarctica.

Dr. Cressman Elected President Of WMO Commission for Aerology

The Third Session of the WMO Commission for Aerology met in Rome from September 18 to October 2, with 87 participants representing 41 nations and six international organizations.

Dr. George P. Cressman, Director of the National Meteorological Center, was elected President of the Commission. In addition to Dr. Cressman, the members of the American delegation were Dr. Henry G. Houghton of the Massachusetts Institute of Technology and Dr. Karl R. Johannessen of Air Weather Service Headquarters. Dr. J. Murray Mitchell, Jr., of the Office of Climatology, served as advisor to the U.S. delegation.

Dr. Cressman presented two papers at the Session, one on the TIROS satellite program and one on numerical weather prediction. Jerome Namias, Chief of the Extended Forecast Branch of the National Meteorological Center, addressed a seminar on long-range forecasting.

International Research In Indian Ocean Area Will Begin in 1962

A major new international research program, the International Indian Ocean Expedition, will begin in the spring of 1962. The expedition is sponsored by the Scientific Committee for Oceanic Research (SCOR) of the International Council of Scientific Unions.

As originally planned, the expedition's main purpose was to study oceanography and marine biology, but a large meteorological program has now been added.

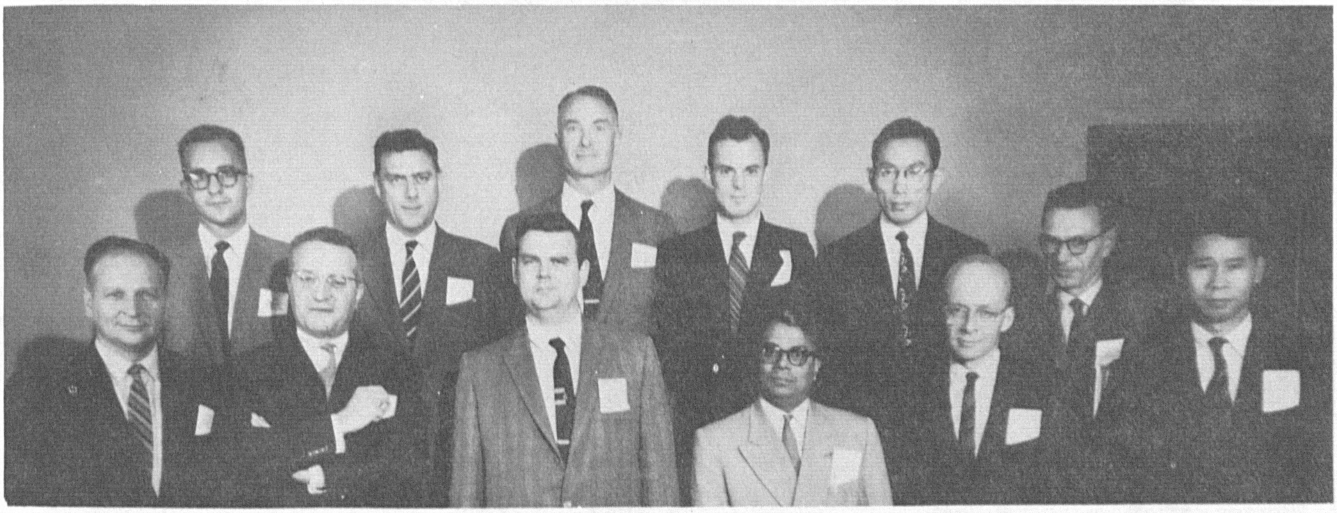
The two-year meteorological program will serve the operational needs of the expedition and will investigate large-scale atmospheric circulation over the Indian Ocean, including the transfer of heat, water vapor, and momentum across the ocean-atmosphere boundary. It is hoped that the research program may lead to improved methods of forecasting the weather in the Indian Ocean area.

To gather the data needed for these studies, weather services of nations bordering the Indian Ocean will enlarge their observational programs along the coast and at sea. Additional networks will be established to measure radiation, ozone, evaporation, and rainfall at sea.

The Weather Bureau plans to use at least two of its research aircraft to gather data in the Indian Ocean area during the summer of 1963. An automatic weather station will be anchored in the Bay of Bengal, reporting standard weather elements.

A National Aeronautics and Space Administration ship is expected to be located near 22° S. and 73° E., making upper-air soundings of temperature, wind, and radiation.

The sponsoring committee has recommended the establishment of an International Meteorological Center at Bombay, to collect data, prepare current weather analyses and forecasts, and conduct research.



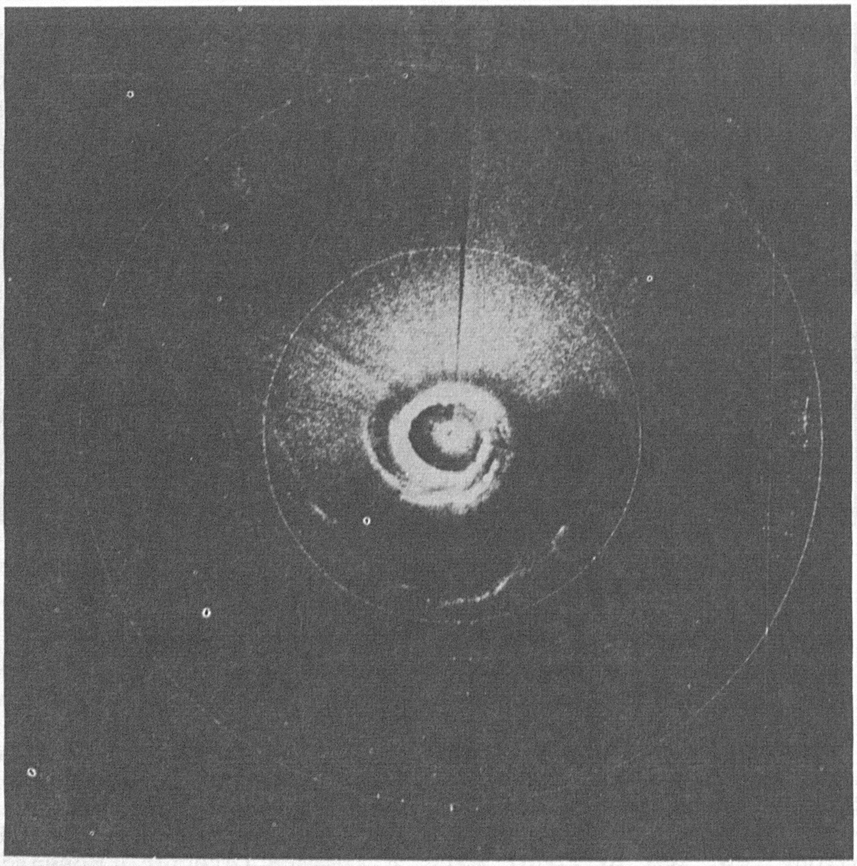
Ninth Weather Radar Conference Held in Kansas City

The Ninth Weather Radar Conference of the American Meteorological Society was held at Kansas City, Missouri, from October 23 through 26, 1961. It was under the co-sponsorship of the Weather Bureau and the Kansas City Seminar of the AMS.

Conference sessions covered many topics, including radar hurricane studies, use of radar in forecasting, characteristics of convective storms, hydrological and climatological applications of radar, severe local storms, radar measurement of air motion, clear air echoes, computations of reflectivities and attenuation, meteorological echo analysis, and instrumentation and data processing.

The conference this year had a truly international character. Some of the representatives from other nations are shown above: (front row, left to right) Dr. Walter Hitschfeld, McGill University, Montreal; André Perlat, Deputy Director, French Meteorological Service; C.L. Crozier, Canadian Meteorological Service, Toronto; H. Mitra, Indian Meteorological Service, New Delhi; Dr. K.L.S. Gunn, McGill University, Montreal; and Miyuki Fujiwara, Illinois State Water Survey, Champaign; (back row, left to right) Marcell Wein, McGill University, Montreal; David Bargman, Deputy Director East African Meteorological Service, Nairobi, Kenya; Dr. John F. Gabites, Director of Research, New Zealand Meteorological Service, Wellington, N.Z.; Paul Hamilton, McGill University, Montreal; Nobuhiko Kodaira, Meteorological Research Institute of Japan, Tokyo; and Dr. W.G. Harper, Meteorological Office, Malvern, England.

An honorary membership in the American Meteorological Society was presented to former President Harry S. Truman. Left to right are Kenneth E. Spengler, Executive Secretary of the AMS; Donald S. Foster, SELS, Kansas City; Mr. Truman; Dr. Thomas F. Malone, president of the AMS; Harrie E. Foster, RADU, Kansas City; and Major Albert Ehrlich, USAF, Kansas City. Mr. Truman was to have been the principal speaker at the radar conference, but was unable to be present.



Before seeding

An hour before seeding, 10-cm. radar showed Hurricane Esther's eye wall to be continuous, with heavy precipitation. The Navy WB-3 carrying the radar was flying at 11,000 feet in the center of the eye. The circles in the photograph are 50 miles apart; the eye is 12 miles in diameter.

After seeding

Twenty - three minutes after seeding, the forward wall of the eye had begun to disappear from view of the 10-cm. radar as the liquid water was converted to ice.

Seeding of Hurricane Esther Successful; Program Will Continue for Several Years

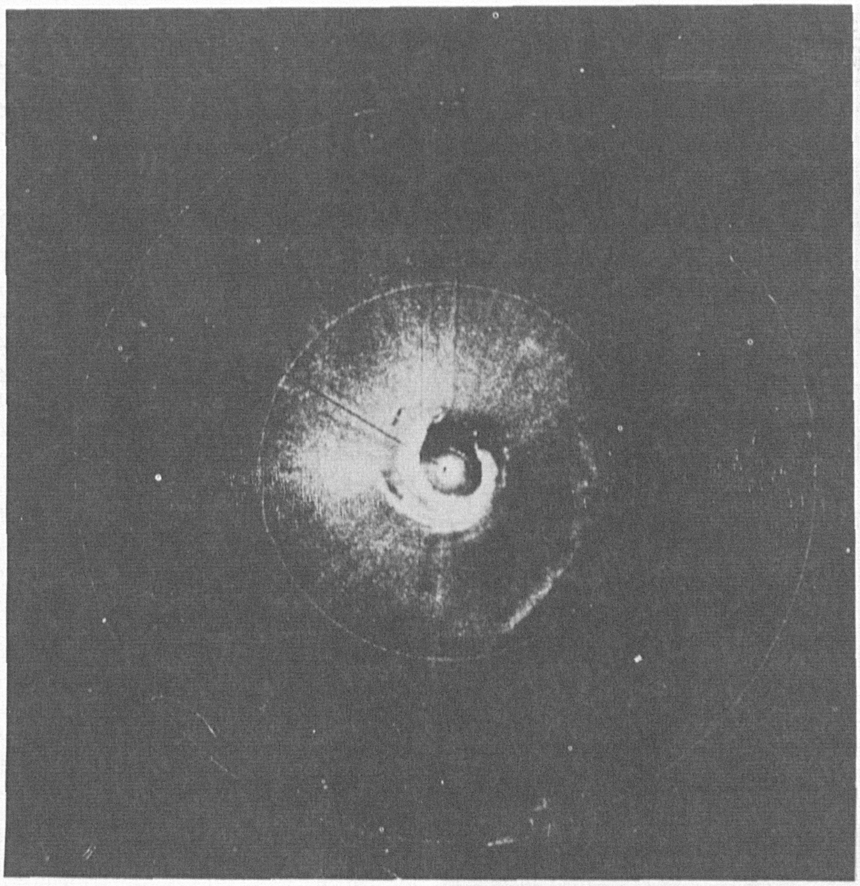
Esther was the first "subject" in a series of hurricane-seeding experiments sponsored jointly by the Weather Bureau and the National Science Foundation. The research, which will probably continue for several years, will explore the possibilities of weather modification in hurricanes.

At the same time, meteorologists at New York University and the National Hurricane Center in Miami are studying the theoretical aspects of this problem. The N.Y.U. project is also sponsored by the National Science Foundation.

The objectives for this past season were to test a silver iodide seeding technique to determine whether large amounts of a supercooled liquid water cloud could be converted to ice at will and under turbulent flying conditions; this is the first step in the modification process.

This year's test involved a single, virtually instantaneous injection of silver iodide. The ultimate plan envisages repetitive seeding at hourly intervals.

On September 16 and 17, radar and visual observations showed Esther's typical spiral rainbands encircling and converging upon the circular eye, whose diameter was 15 to 20 miles. The eye itself was clear above the 7,000 foot level. Forming the cloud floor of the eye was the familiar pattern of small cumulus and stratocumulus spiraling around a central hub cloud, the entire mass of which was almost completely separated from the eye wall by an open space through which the sea was visible. Overhead, the deep blue sky was partially obscured from time to time by fingers of cirrus spiraling cyclonically toward the low pressure center from a region above the visible portion of the high wall. Near the storm core, the wind decreased very little with height, and the pressure



ly sees ice crystals and snow only faintly, if at all, whereas 3-cm. radar usually sees them quite well. The conclusion is that the disappearance of the forward portion of the wall to the 10-cm. radar was due primarily to the change of liquid water to ice.

Other evidence showed that the amount of liquid water had drastically changed. Before the seeding began, the DC-6's and the B-57 had encountered enormous amounts of icing. At 20,000 feet, the DC-6 had its indicated air speed reduced from 190 knots to less than 120 knots in a very short period of time during its circuits before seeding. The B-57 encountered heavy icing and some turbulence on both the north and south walls of the eye before seeding.

After seeding, the icing at the 20,000-foot level was almost eliminated in some sectors. At the B-57 level, the icing was absent on the north wall, but was present in abundance on the south wall.

gradient changed very little through the low and middle tropopause. In the areas above the freezing level, little snow was found in the clouds surrounding the eye; large amounts of supercooled water were present even to the 45,000-foot level, where temperatures ranged from -45° C. to -57° C.

Seven planes joined in the seeding experiment, which staged from Puerto Rico on September 16 and 17. These included the four aircraft of the Weather Bureau's Research Flight Facility, one Navy A-3D and WV-3, and an Air Force U-2.

The portion of the storm selected for observation was a pie-shaped area extending 60 miles to the right of the storm center. The two DC-6's and B-57 of the Research Flight Facility patrolled this sector for three hours before and two hours after the operation to record any changes in the properties of the storm. The B-26 carried out a separate mission, obtaining data from a segment of a spiral rainband.

The A-3D released the silver iodide into the cloud tops near the point of maximum winds, along a track 90° to the right of the storm path, beginning at a point four miles inland from the cloud wall and extending eight miles outward into the rainy vortex. The silver iodide smoke was injected rapidly downward from the cloud tops to the freezing level, traveling through an atmospheric layer six miles thick.

After the seeding, the 10-cm. APS-20 radar on the Navy WV-3 aircraft saw a rapid transition occur as the seeded sector of the north eye wall disappeared from view. A 3-cm. APS-45 on the WV-3 observed no gap in the eye wall, nor any appreciable change in the eye.

10-cm. radar characteristical-

Probably 400 cubic miles of water cloud were converted to ice in a period of about 40 minutes, releasing energy (in the form of latent heat of fusion) equal to approximately 200 million kilowatt-hours of electrical energy or to about eight atomic bombs of the 20-kiloton variety. This is actually less than one-tenth of one percent of the energy released by the hurricane in the same 40-minute period.

The mean wind in the layer where the silver iodide was imbedded averaged about 70 knots and should have carried the crystals all the way around the storm in about 50 minutes. However, less than half of the eye wall disappeared from view of the 10-cm. radar, indicating that the crystals were simply swept up and out before they could circulate around the eye. Within two hours after the seeding, the eye wall had built back into full view of the 10-cm. radar.

Weathermen From 13 Nations Trained by Bureau in 1961

Each year, a number of weathermen from other nations come to the United States for training in meteorology and related subjects under the direction of the Weather Bureau. In 1961, the following 30 meteorologists, some sponsored by the United Nations and some by the International Cooperation Administration, received Weather Bureau training:

Argentina

Luis M. Ostiglia
Enrique D. Podesta

Brazil

Fabio de Alcantara
Robert de F. Caracciolo
Roberto V. Pereira

Chile

Jaime B. Lavin

Ethiopia

Gizaw Attlee
Kebede Tato

Greece

Dionyssios Metaxas

India

Harendra Mitra

Korea

Yongdai Park

Lebanon

Adnan Hajj
George T. Maalouf

Philippines

Jesús F. Flores

Sudan

Geili Mustafa
A.-Aziz Salih Saeed

Thailand

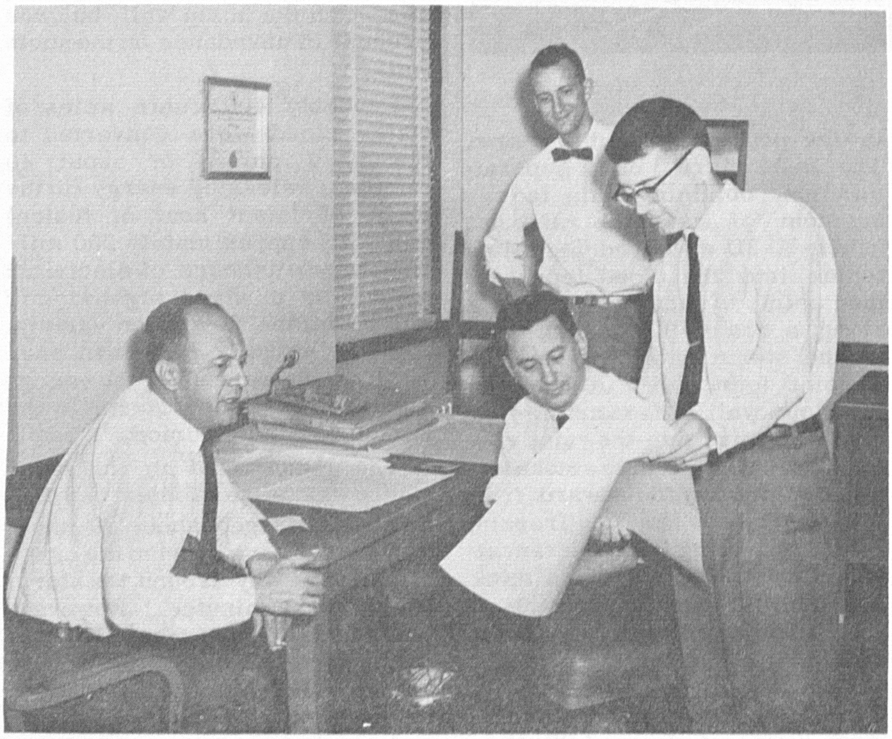
Kajit Buajitti
Raviwong V. Bunnag
Dhawee Montrivade
Srigula Nondhasee
Thaworn Pongsapipat
Surin Sangsnit

Viet Nam

Dinh Trong Chau
Do Dinh Cuong
Nguyen Huu Hau
Nguyen Kim Mon
Nguyen Huu Thieu
Ha Quang Thuan
Tran Cao Vinh

Yugoslavia

Danilo Furlan



Captain Roberto Pereira (left) and Captain Robert Caracciolo (seated), the Chief and Deputy Chief of the Weather Service Branch of the Brazilian Air Force, discuss techniques of forecasting severe weather with Bernard W. Magor (holding chart) and Robert F. Krebs, of the Weather Bureau's Severe Local Storms Forecast Center in Kansas City.

Jessie S. Taylor Dies; Award-Winning Observer Served Bureau 61 Years

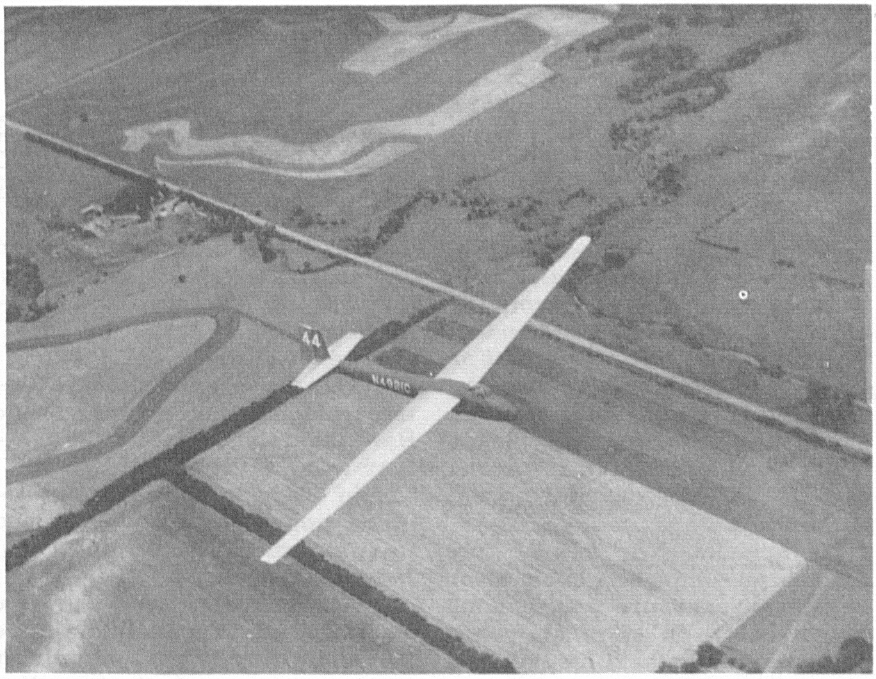
Mrs. Jessie Stevens Taylor, cooperative weather observer since 1900 at Southport, North Carolina, died November 18, 1961. Mrs. Taylor had taken daily weather observations longer than any other woman in the United States. In addition to her service as cooperative observer, Mrs. Taylor had been storm warning displayman at Southport since 1921, when she took over this duty from her father, who had been displayman since 1906.

President Eisenhower wrote Mrs. Taylor a letter of commendation in 1955 for her long and faithful service to the nation. Also that year, Mrs. Taylor received a silver medal for meritorious service from the Department of Commerce, in recognition of her "outstanding service in warning the public of the approach of Hurricane Hazel."

Mrs. Taylor remained at her telephone throughout the night of October 14, 1954, warning coastal residents as Hurricane Hazel threatened. As a result of Mrs. Taylor's efforts, no lives were lost in Southport, although the hurricane destroyed hundreds of homes in the area.

Born in Chicago on September 22, 1879, Mrs. Taylor moved to Southport in 1888. In addition to her work for the Weather Bureau, she was active in church and civic affairs. She was married to Charles Edward Taylor from 1909 until his death in 1944. Mrs. Taylor is survived by four children and seven grandchildren.

In a message to the Taylor family, Dr. Reichelderfer expressed the feelings of the many friends of Mrs. Taylor in the Weather Bureau: "...A fine lady and wonderful public servant, she contributed much to the climatological and safety programs of the Weather Bureau. We shall always regard her as one of our most distinguished cooperative observers and her good works will continue to live with us."



Sailplane in flight over Central Kansas (Photograph by John Zimmerman, Wichita Eagle-Beacon)

Forecaster Briefs Glider Pilots In U.S. Soaring Championships

WBAS Wichita assisted the 28th annual U.S. Soaring Championships, held August 1 thrugh 10, 1961, at Wichita National Airport. As at several previous contests, the official meteorologist was Ted Lange of WBAS Fort Worth, detailed to Wichita for the event.

With the help of the Airport Station he conducted weather briefings for the glider pilots and prepared adiabatic, surface, and upper-level charts. WBAS aided wind forecasting for the meet with PIBAL launchings each morning. Also, Wichita's WSR-57 radar provided valuable supplementary information.

The championships were the first held at a busy large city airport. Full cooperation of meet officials with airport personnel and the FAA control tower enabled normal airport traffic to continue without interference.

Although the efficient work of the weathermen helped the contest run smoothly, the weather itself was not highly cooperative. Sailplanes were launched on nine of the ten days, but minimum conditions for contest soaring were met on only five days, the minimum allowable for an official meet.

Meteorological Readings

Introduction: Meteorological Readings is an organized program of reading assignments for all Weather Bureau personnel who wish to participate. For more introductory information, see TOPICS May 1957. When submitting answer cards, please mark envelope in lower left corner: "Meteorological Readings."

Assignment No. LIII: This article presents new means for sea-level pressure and 700-mb height based on 12 recent years of upper-air data. Comparisons are made with the normals currently used (Technical Paper No. 21) and differences from these normals are emphasized. "Mean Circulation Patterns Based on 12 Years of Recent Northern Hemisphere Data," by James F. O'Connor, Monthly Weather Review Vol. 89, No. 7, July 1961.

QUESTIONNAIRE

Col. 61 The basic set of charts in this study are derived from:

1. thirty separate daily analyses for each monthly mean chart
2. a full 12-year average in all areas
3. eight years of independent data in comparison to the 1952 normals
4. the longest discontinuous period of relatively accurate hemispheric analyses for 700-mb. available

Col. 62 According to figure 13:

1. Easterlies predominate at least a full month longer than they did in the 1952 normal for the area between 20° N and 35° N
2. The polar westerlies have decreased less on the average than the temperate latitude westerlies
3. It is evident that the 1952 normals were in error
4. The sub-tropical regime clearly shows a surface wind minimum in July

Col. 63 In comparing the mean and normal (1952) circulation features at 700 mb, the following are noted. Mark any or all correct answers.

1. The mean data show a 700-mb trough in the vicinity of the Hawaiian Islands during the summer rainy season.
2. In the mean data troughs replace ridges near Spitzbergen and in western Russia throughout most of the year.
3. The normals (1952) show the Pacific High is tricellular in the fall and winter months, bicellular in the spring, and single-celled and strongest in July.
4. The 12-year means show the Baffin Island Low not as deep, the North American East Coast trough further west in December and the Siberian Arctic Low the deepest system in the Northern Hemisphere in April.

Col. 64 In this article the author concludes:

1. The 1952 normal charts are as accurate as the 12-year means in depicting 700-mb features.
2. Nearly all of the differences are due to errors in the earlier normals.
3. Revision of normal charts is advised as more recent and accurate data are available.
4. Methods of reduction to sea level may account for thickness (1000 to 700) differences of as much as 400 feet.

Col. 65 Which one of the following is not a distinguishing characteristic of the sea level 12-year averages?

1. a Low over southern China in July
2. a closed Low southwest of Iceland in June
3. a weak High over the Philippines in July
4. a Low in the Bering Sea in November

Col. 66 The means presented in this paper are:

1. based on 12 years of independent data
2. based on less than four years of data over much of Africa and Asia
3. considered least reliable over the interior of southeast Asia
4. considered least reliable over ocean area

Col. 67 In connection with the Siberian Arctic Low at 700 mb the 12-year means show:

1. an eastward displacement in December
2. a single deep center in April over Baffin Island
3. a reversal from the earlier normals for January regarding the relationship to the Kamchatka Low
4. none of the above

Col. 68 The thickness departure charts show:

1. 1000 to 500 mb thickness departures
2. totally meaningless results due to differences in reduction methods
3. rather pronounced cooling over Alaska in February
4. generally positive thicknesses in the Pacific from November to June

Col. 69 The North African coastal trough behaves in almost precisely the same fashion as:

1. the Russian trough
2. the Bengal trough
3. the Alaskan trough
4. none of the above

Col. 70 The author's primary evidence offered in support of secular trends concerns:

1. significant departure areas explained synoptically by others
2. pairs of (dynamically reasonable) opposite height departures the occurrence of which by chance is highly unlikely
3. the unlikelihood of all the differences being due to errors in previous normals
4. the known increase in blocking patterns of recent years

Length of Service Awards

40-Year Awards

Marvin A. Baldwin,
WBAS, Spartanburg
George L. Canaday,
WBO, New Orleans

35-Year Awards

Claude R. Bird,
WBAS, Salt Lake City
Cecil R. Guern,
WBAS, Great Falls
Leroy F. Hafer,
O&SF, Central Office
Jewel K. Hargis,
WBAS, Alexandria, La.
Floyd H. Pearson,
WBAS, Detroit
Harris M. Perry,
WBO, Cape Henry

30-Year Awards

Robert C. Borders,
WBAS, Yakima, Wash.
Marion E. Crawford,
WBAS, Atlanta
George C. Denman,
WBAS, Milford, Utah
Fred J. Trilety,
WBO, Cincinnati
Chester E. Wilcox,
WBAS, Binghamton
Wendell H. Woodward,
WBAS, Seattle (Sea-Tac)

25-Year Awards

Robert G. Carman,
WBAS, Green Bay
Charles B. Carney,
WBAS, Raleigh
William L. Denmark,
WBO, Champaign
Horace C. Dwelle,
WBO, Parkersburg
Bernard Edelman,
F&SR, Central Office
Jesse J. Halsey,
WBAS, Ft. Wayne
Robert G. Hill,
WBAS, Reno
Vincent J. Oliver,
F&SR, Central Office
Lawrence C. Pierce,
WBAS, Harrisburg
John I. Shope,
F&SR, Central Office
Parke P. Starke,
O&SF, Central Office

15-Year Awards

Guy A. Barkley,
WBAS, Knoxville
Thomas J. Bowers,
WBAS, Columbus
Ellis B. Burton,
WBAS, Denver
Lloyd W. Chamberlain,
WBO, Wallops Station
Martha J. Cummings,
F&SR, Central Office
Iris L. Greninger,
WBAS, St. Louis
Jack R. Hicks,
WBAS, Lake Charles
John D. Kelly,
Adm. Ops., Central Office
Frank J. Kocsis,
WBAS, Truk
Vincent J. Maloney,
NMC, Central Office
Marvin G. McQuate,
WBAS, Cheyenne
Donald L. Quick,
WBO, Albany
Loretta F. Roeseler,
WBAS, Denver

Five New MIC's Selected; Other Appointments Announced

Chalmers C. Wooden has been selected to fill the Meteorologist in Charge position at Augusta, Georgia. Mr. Wooden has been stationed at Waco, Texas, since he entered the Bureau 19 years ago. From 1932 to 1942, he was a schoolteacher and principal in Texas. He attended Trinity University, Southwest Texas State Teachers College, McMurry College, and the University of Tennessee, and graduated from North Texas State Teachers College.

The new Meteorologist in Charge of the Weather Bureau Airport Station in Greensboro, North Carolina, Floyd C. Pate, has been MIC at Eniwetok since October 1960. Mr. Pate graduated from Guilford College and taught mathematics and science in North Carolina, before coming to the Weather Bureau in 1930. He has served in Raleigh, N.C., Shreveport, La., Montgomery, Ala., Caribou, Me., and Lynchburg, Va., in addition to Eniwetok. At Caribou and Lynchburg, he was MIC of the station.

Lloyd W. Tourville is the new Meteorologist in Charge of the Weather Bureau Airport Station at Pt. Mugu, California. Mr. Tourville was in the Air Force from 1942 to 1946 and later earned a bachelor's degree at American International College and a master's degree at Florida State University. Entering the Weather Bureau in 1955, he served in Alaska at Fairbanks, Cold Bay, and Anchorage. Since 1959, he has been with the Meteorological Satellite Laboratory.

Robert J. Waite, the new Meteorologist in Charge of the Tulsa, Oklahoma, Weather Bureau Airport Station, has served in Thomasville, Georgia, since 1960 as weather consultant to OCDM Region 3. Mr. Waite attended Clarion Normal School, the University of Texas, and the College of the Pacific, and received his bachelor's degree from the College of Wooster. He became a Junior Observer at Cleveland in 1930 and was stationed at Winslow, Anchorage, Miami, and New Orleans, before moving to Thomasville. Mr. Waite was a member of the Ninth Advanced Study Group, which met in the Central Office in 1960.

The new State Climatologist for Tennessee is Morton H. Bailey. Since entering the Weather Bureau in 1948, Mr. Bailey has served at Melbourne, Florida; Rome, Georgia; Corpus Christi; Birmingham; the Central Office; and the National Weather Records Center in Asheville.

H.C. Dwelle is the new Meteorologist in Charge of the Weather Bureau Office in Parkersburg, West Virginia. Other new appointments recently announced include: S.G. Holbrook, State Climatologist, Oklahoma; Douglas L. Davis, OIC, Cold Bay, Alaska; William L. Exley, OIC, St. Paul Island, Alaska; and LeRoy W. Borg, OIC, Bethel, Alaska.

Welcome to the Weather Bureau

Edwin S. Addison, III, Meteorologist, Grand Rapids
LaRue F. Amacher, Meteorological Technician, Central Office
Arthur J. Anderson, Meteorological Technician, Albuquerque
Charles Carter Anderson, Jr., Systems Accountant, Central Office
Eugene E. Beall, Electronics Maintenance Technician, Tampa
Benjamin Berkofsky, Digital Computer Systems Operator, Central Office
Helen Y. Bossard, Management Analyst, Central Office
Carl F. Bott, Meteorological Technician, Winnemucca
Rhudolph Burkett, Electronic Maintenance Technician, Detroit
Richard L. Burris, Meteorological Technician, Amarillo
Maurice W. Carter, Meteorological Technician, Memphis
Carl P. Caterino, Maintenance Supervisor, New York
William H. Clark, III, Mail Clerk, Central Office
Donald P. Clemons, Meteorological Technician, Burrwood, La.
Mary Lou Clenny, Clerk-Stenographer, Kansas City
Doyle Conner, Mail Clerk, Asheville
Lawrence Conner, Meteorological Technician, Winslow, Ariz.
John J. Corbett, Meteorological Technician, Boston
John David Davenport, Teletypist, Central Office
Roger A. Davis, Meteorological Technician, Central Office
Richard Donald Decker, Meteorologist, Miami
Brigitte G. DePonte, Accounting & Fiscal Clerk, Anchorage
Evalyn M. Docekal, Clerk-Stenographer, Kansas City
Marcus M. Dunlap, Electronic Maintenance Technician, Minneapolis
Harold J. Emery, Meteorological Technician, Columbia, Mo.
William A. Evans, Meteorological Technician, Winslow, Ariz.
L.J. Everitt, Mechanical Engineer, Central Office
Frank C. Farrington, Meteorological Technician, Meacham, Ore.
Edwin B. Fawcett, Supervisory Meteorologist, Central Office
Robert B. Feldman, Meteorological Technician, Las Vegas
Frederick E. Fowler, Meteorological Technician, San Antonio
William O. French, Jr., Supervisory Meteorologist, Central Office
Charles G. Garrison, Meteorological Technician, Amarillo
Keith Giles, Meteorologist, Central Office
Patricia M. Goins, Secretary, Helena, Mont.
Gerald D. Goodwin, Meteorological Technician, Goodland, Kans.
W. Ferguson Hall, Meteorologist, Central Office
Jerry A. Hanks, Meteorological Technician, Central Office
Katherine E. Hanson, Voucher Examiner, Anchorage
Gladys S.F. Hart, Accounting & Fiscal Clerk, Fort Worth
Robert Alfred Heintze, Management Analyst, Central Office
Frances H. Hennessy, Meteorologist, New York
Florence I. Howard, Clerk-Typist, Kansas City
Ronald J. Hyrkas, Electronic Technician, Central Office
Charles W. Inskip, Meteorologist, Central Office
Berenice K. Ioerger, Clerk-Typist, Wichita
Charles H. Jenkins, Meteorological Technician, Burrwood, La.
Francis B. Kehir, Meteorological Technician, Boston
Bessie H.S. Kim, Secretary, Honolulu
Adam B. Kochanski, Meteorologist, Central Office
Joseph J. Lacey, Meteorological Technician, San Francisco
Filomena LaMotte, Secretary, New York
Lillian C. Langdon, Meteorological Technician, Central Office
James L. Lee, Meteorologist, Amarillo
Anthony D. Lentini, Meteorological Technician, Ely, Nev.
John H. Lentz, Meteorologist, Jackson, Miss.
Charles D. Lett, Electronic Technician, Buffalo
George Henry Lynn, Meteorologist, San Antonio
Nathan Mandel, Position Classification Specialist, Central Office
Robert W. May, Administrative Assistant, Central Office
George H. McCormick, Instrument Maker, Central Office
Jake E. McKnight, Meteorological Technician, Memphis
Katherine Mellonas, Clerk-Typist, Central Office
Eleanor T. Mendez, Clerk-Typist, Honolulu
Joseph M. Meserve, Meteorologist, Central Office
Richard E. Mitchell, Meteorological Technician, Norfolk
Salvatore R. Moltisanti, Clerk, New York
James E. Morris, Electronic Maintenance Technician, Little Rock
Joseph T. Musumeci, Meteorological Technician, San Francisco
Theresa F. Niland, Clerk-Typist, Central Office
Terrell L. Noffsinger, Supervisory Meteorologist, Central Office
Richard K. Nolf, Meteorological Technician, Boston
David H. Owens, Meteorological Technician, Midland
Mary J. Palumbo, Accounting Technician, New York
Annabelle Pauer, Teletypist, Miami
Dean A. Peckham, Meteorologist, Central Office
Earl R. Posima, Meteorological Technician, Kansas City
Jo Ann Poynor, Clerk-Typist, Fort Worth
Charles W. Prescott, Meteorologist, Vicksburg

Transfers

	From	To
Takis A. Abramides	New York	Oklahoma City
Paul Loring Adams	Resolute Bay	Central Office
Kotan E. Airam	Yap	Majuro
Jerry P. Allred	Ely, Nev.	Resolute Bay
Elwyn E. Anderson	Idaho Falls	Washington, D.C.
Gerald E. Andress	Columbus	Cleveland
Evan W. Armstrong	Albuquerque	Canton Island
June G. Bacon	Central Office	New York
Morton H. Bailey	Asheville	Nashville
Robert L. Baldwin	Anchorage	Fairbanks
George H. Barnes	New York	Portland, Me.
John J. Barter	Sterling, Va.	New York
Henry C. Bigelow	Seattle	Tatoosh Island
David I. Blumenstock	Honolulu	San Francisco
Ottis C. Bobbitt	Dodge City	San Angelo
James E. Boudreaux	Canton Island	Kwajalein
Leon A. Brock	Tampa	Athens, Ga.
Andrew H. Brown	Birmingham	Anchorage
Merle J. Brown	Salt Lake City	Honolulu
Alfona S. Christianson	San Francisco	Seattle
Dale O. Collins	Central Office	Salt Lake City
Richard R. Cronkwright	Greenville, S.C.	Galveston
John D. Croslin	New Orleans	Houston
Denzil R. Davis	Vicksburg	Tallahassee
Jesse David Dean	Central Office	Antarctica
Robert F. DeLong	Daytona Beach	Key West
William L. Denmark	St. Louis	Champaign
Robert J. Dietlein	New York	Birmingham
Vernon F. Dvorak	Central Office	Pt. Mugu
Earl J. Edmondson	Athens, Ga.	Jacksonville
Charlie O. Evans	McGrath, Alaska	Bismarck
Travis D. Flatt	Brownsville	Albuquerque
Wilson Floe	Canton Island	Kwajalein
George M. Foster, Jr.	Nome	Wallops Island
Robert Frazier	Norfolk	Central Office
Edward J. Geer	Ely, Nev.	Winslow, Ariz.
Harold Paul Gerrish	Miami	Jacksonville
Charles A. Giannetta	Central Office	Buffalo
Walter L. Gibson	Eniwetok	Buffalo
Robert A. Gilcrest	Tulsa	Central Office
Burton D. Goldenberg	Newark	Antarctica
Westley K. Goodsell	Central Office	Resolute Bay
William V. Greco	Sault Ste. Marie	Huntington
Clifton W. Green	Wichita Falls	Oklahoma City
Robert P. Green, Jr.	Greensboro	Huntington
Donald J. Haddock	San Antonio	Weslaco, Tex.
Rheinhart W. Harms	Champaign	Milwaukee
Harry D. Harper	Barter Island	King Salmon
Frederick C. Hochreiter, Jr.	Juneau	Philadelphia
Jay Hull	Key West	Central Office
Neil J. Ingram	Hilo, Hawaii	Canton Island
James L. Irwin	Shreveport	Tulsa
Dean Neldon Jackman	San Francisco	Salt Lake City
Ray E. Jensen	Fargo	Brownsville
Albert L. Kellerstrass	Raleigh	Cincinnati
William G. Kiffe	Central Office	Seattle
William H. Kohnke	Salt Lake City	San Francisco
Stanley J. Lacy	Medford	Central Office
David B. Lamb	Seattle	Fort Huachuca
Frank E. Lambrecht	Anchorage	Medford
Milton K.K. Lau	Canton Island	Eniwetok
Clarence B.H. Lee	Wake Island	Honolulu
Richard E. Lettin	Montgomery	Tallahassee
John Henry Maloney, Jr.	Truk	Wake Island
Andres Martinez	Buffalo	San Juan
John P. McCallister	Kansas City	Fort Worth
James P. McCurdy	Chicago	Central Office
Edward A. Miechowicz	Cleveland	Buffalo
Marvin E. Miller	Indianapolis	Cincinnati
Robert E. Muller	Grand Rapids	Detroit
Louis Novotny	Central Office	Point Mugu
George Y. Okoji	Johnston Island	Eniwetok
Albert Oliver	Hartford	Charleston, W. Va.
William P. Palmer	Tatoosh Island	Seattle
Floyd C. Pate	Eniwetok	Greensboro
Jack L. Paup	Brownsville	Fort Worth
Monte F. Poindexter	Isachsen, NWT	Antarctica
George E. Polka	Columbia, Mo.	Wallops Island
Martin C. Predoehl	Burbank	Central Office
Robert C. Pritchard	Johnston Island	Montgomery
B.H. Quattlebaum, Jr.	Birmingham	Memphis

A meeting of Southeast Area State Climatologists was held at Chattanooga, Tennessee, from October 25 to 27. Attending the meeting were (seated, left to right) W.L. Thompson, Regional Administrative Officer; C.K. Vestal, Area Climatologist; N. Kronberg, South Carolina; K.D. Butson, Florida; J.T. Harden, Virginia; R. Sanders, Louisiana-Mississippi; A.V. Hardy, North Carolina; (standing, left to right) O.K. Anderson, Kentucky; J.E. Stork, WRPC Chattanooga; J.A. Riley, Jr., F&SR; H.S. Carter, Georgia; J.W. Measells, F&SR; A.B. Long, Alabama; J.T.B. Beard, WRPC Chattanooga; L.A. Joos, Central Office representative; M.H. Bailey, Tennessee; S.G. Holbrook, Oklahoma; and V.D. Steves, WRPC Chattanooga.

12 Employees Study Agricultural Meteorology

Twelve Weather Bureau employees are assigned to training in agricultural meteorology in connection with the Bureau's expanded program of weather services to agriculture.

Attending courses at Rutgers University during the Fall 1961 semester are Robert M. Black, WBAS, Des Moines; Charles L. Conway, DMO, Washington, D.C.; Herbert C. Dahl, WBAS, Indianapolis; Donald V. Dunlap, WBO, Trenton; Maurice H. Faubion, WBAS, Springfield, Mo.; Charles R. Gray, WBAS, Meridian, Miss.; Leonard F. Hand, NMC, Washington; Alex J. Kish, WBAS, Jackson, Miss.; Michael J. Scarpa, NMC, Washington; David J. Stevlingson, WBAS, Boise; Walter L. Stirm, OCDM, Battle Creek; and Vincent J. Valli, WBAS, Windsor Locks, Conn.

RETIREMENTS

Henry Levy

Henry Levy, a Meteorological Technician at the Weather Bureau Airport Station in Baltimore, Maryland, retired on October 31 after 41 years of Bureau service. Mr. Levy came to the Weather Bureau in 1920 as a Messenger Boy at Baltimore and has been stationed there throughout his career. In 1928, he received a Bachelor of Laws degree from the University of Baltimore. Mr. Levy's address is 3803-B Parkview Avenue, Baltimore 7, Maryland.

Esther G. Lord

Mrs. Esther G. Lord, a Clerk-Stenographer in the Training Section of the Personnel Operations Division, retired on November 13. Mrs. Lord entered the Weather Bureau in 1942 as a Junior Clerk-Stenographer in the Statistical Investigations Division. In 1944, she transferred to the Training Section, remaining there until her retirement. Mrs. Lord's address is 3708 Underwood Street, Chevy Chase 15, Maryland.

Norabelle Sperry

Miss Norabelle Sperry, a Clerk at the Weather Bureau Airport Station in Bismarck, North Dakota, retired on November 9. Miss Sperry worked for the State of North Dakota before entering the Bureau in 1945. She transferred to the Department of Agriculture's Soil Conservation Service in 1954 and returned to the Weather Bureau in 1956. Miss Sperry's address is c/o Mrs. Ed Lee, RR #1, Bismarck, North Dakota.

Briefs from the CO Staff Conferences

Reporting on the implementation of the National Operational Meteorological Satellite System (NOMSS), David Johnson said that the Meteorological Satellite Laboratory, two Weather Bureau stations, the Programming and Processing Section, and the Documentation Section are fully operational. Remaining satellite activities are in the process of development. The work now in progress includes revision and expansion of "Technical Plan for Nimbus Data Utilization," negotiation of a contract for a quick design study of the data-processing subsystem for the first Nimbus, development of computer codes for processing Nimbus data at Suitland, and planning for archival data processing, storage, retrieval, and reproduction. $600,000 has been transferred to GSA for construction of a second floor on the new wing at FOB-4 to house NOMSS activities.

Dr. Cressman reported on the Third Session of the WMO Commission for Aerology (see page 192). During the Session, Dr. Sutcliffe, the outgoing President of the Commission, expressed concern about so many large international research projects originating outside the WMO, only to come to the WMO later for support and participation by Member countries. As a result, Member nations are brought into a program too late to have much say in its implementation, but are called upon to establish new observing stations, new facilities, and other activities. A number of meteorological services are quite concerned about this trend.

In transmitting the Weather Bureau's 1963 budget requests to the Bureau of the Budget, the Secretary of Commerce said: "We feel certain the Weather Bureau (satellite) program holds great promise as a revolutionary new observational system, and we are asking the Bureau to commence study of the longer range implications of satellite observations on the present observational and forecast network." The Office of Planning was assigned to make such a study and was asked to report periodically on its findings.

In a discussion of R&D funding, Dr. Wexler suggested that the Bureau might obtain more funds for research by combining scattered projects into attractive and logical packages. Hurricane research and satellite meteorology are two such packages that have been readily supported. Mr. Gleiter reported that the trend at the Budget Bureau has been toward the big package approach with costs projected over a five-year period, rather than reviewing on a year-by-year basis only. Dr. Landsberg suggested that funds should still be provided somehow for use on problems that need immediate attention, because it is difficult to foresee exactly what we will want to study three, five, or ten years in the future.

The growing importance of the National Coordinating Committee for Aviation Meteorology was discussed. It was pointed out that, in order to strengthen our programs, the Bureau should bring major problems in aviation meteorology to the Committee's attention.

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