

ESSA NEWS

U.S. DEPARTMENT OF COMMERCE ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

Twister Cuts Eight-Mile Path Through Lubbock, Tex.; Lubbock Weather Bureau Staff Praised for Warnings

A massive tornado ripped through Lubbock, Tex., on Monday, May 11. It hit the center of the city about 9:40 p.m. CDT, devastating everything along its 8-mile path. The width of the path ranged from 1/4 of a mile to a mile and a half.

Latest figures show 21 persons dead; injuries to more than 300 (40 are still hospitalized, 4 in critical condition). Damage was estimated at \$150 million.

Early weather warnings, an alert citizenry, and teamwork between the staff of the Lubbock Weather Bureau, city and civil defense officials, the Texas department of public safety, and television and radio stations, were credited with keeping the death toll from being in the hundreds.

A special ESSA team headed by Donald House, Chief, Atmospheric Science Services Div., Office of Plans and Programs, was dispatched by Dr. White to the disaster scene to evaluate the warning system. Other members of the team included Sam Grimm, Chief of the Weather Bureau's Emergency Warning Section; Robert Beck, Office of Plans and Programs; and Herbert Lieb, Deputy Director of Public Information. The team was joined at the scene by Harold McCrabb and Joe Sassman of the Weather Bureau's Southern Region.

Jay Harris, Executive Editor of the Lubbock-Avalanche Journal, told the survey team that the Lubbock Weather Bureau office did an outstanding job of keeping on top of the tornado situation and also cited early warnings in an outbreak that occurred three weeks earlier.

"It was not possible for the Weather Bureau to have done a better job (in the Lubbock tornado). It was remarkable," Mr. Harris said.

Mr. Harris was serving as night editor on Monday, May 11, when the tornado hit. His eyewitness account, published in the Lubbock-Avalanche Journal, is reprinted on page 4, with his permission. A summary of the actions taken by the Lubbock Weather Bureau Office prior to the onslaught of the tornado appears on pages 6 and 7.

In a May 19 letter to Harold Frost, Lubbock Weather Bureau Office meteorologist in charge, Dr. White, ESSA Administrator said:

"The ESSA survey team, which spent the last few days in Lubbock surveying the performance of the ESSA weather warning system in connection with the Lubbock tornado, reported orally to me today. All members of the survey team with whom I spoke had nothing but the highest praise for the actions taken.

"You and your staff are to be commended in the highest possible terms for your truly outstanding achievement in doing everything humanly and technically possible to warn the citizens of Lubbock of the approach of what turned out to be among the most devastating tornadoes in our history.

"The citizenry of Lubbock, and indeed all of the citizens of this nation, will always be indebted to you and your staff for a magnificent achievement in the face of enormous danger. Please accept my deep appreciation for a job well done."

Bids for Construction of AOML Headquarters To Be Solicited



The new building to be constructed for AOML will be on Virginia Key, Miami, in the foreground above.

Bids for construction of the ESSA Research Laboratories' Atlantic Oceanographic and Meteorological Laboratories on Virginia Key, Miami, will be solicited soon, and construction is expected to begin this year.

The laboratories, headed by Dr. Harris B. Stewart, are now dispersed in numerous temporary locations in Miami. The planned facility will bring together under one roof the employees from various scientific disciplines--the Physical Oceanographic Laboratory, National Hurricane Research Laboratory, Marine Geology and Geophysics Laboratory, Experimental Meteorology Laboratory, and the Sea-Air Interaction Laboratory.

They will draw upon the collective strength of several ESSA groups in the Miami area, including the Research Flight Facility, the Weather Bureau's National Hurricane Center, and the Coast and Geodetic Survey's Engineering Development Laboratory.

Virginia Key was chosen as the Laboratories' site in 1967, after an investigation of 115 East Coast locations. The Dade County Commissioners provided land on the Key for the facility without charge.

Dade County also provided space at nearby Dodge Island for several ESSA Coast Survey ships--the USC&GSS DISCOVERER, the USC&GSS RESEARCHER (to be commissioned next fall), and a coastal survey ship. All will play an important role in the work of the laboratories.

Four ESSA Publications Take Top Awards in FEA Contest

Four ESSA publications won Blue Pencil Awards in the Federal Editors Association's 7th Annual Contest for government publications issued in 1969. "Clouds," by Carl A. Posey of the ESSA Office of Public Information, took first prize for leaflets in two or more colors. Another first prize winner was a press release, "ESSA Initiates Skywarn Campaign To Lower Tornado Death Toll," by Ann K. Cook of the ESSA Office of Public Information. ESSA Monograph 2, the 416-page "Mathematical Geodesy" by the late Martin Hotine, placed second in the category for technical publications in one color, of more than 50 pages. The monograph was editorially produced by the Editorial Branch, Scientific Information and Documentation Division, with John Bernick serving as its technical editor. "ESSA World," published by the ESSA Office of Public Information, took third place in the one-color popular magazine competition.

ERL Scientific Delegation Attends Soviet Symposium

Dr. Wilmot N. Hess, ERL Director, led a delegation of nine U.S. scientists to the International Symposium on Solar-Terrestrial Physics held in Leningrad, May 11-19, where he is scheduled to present a paper on his work with artificial aurora. Many of the scientists will remain in Russia for a meeting of the Committee on Space Research (COSPAR), which began May 20. Accompanying Dr. Hess were: Robert W. Knecht, ERL Deputy Director; Dr. Leroy R. Alldredge, Director, Earth Sciences Laboratory; Alan H. Shapley, Director, Office of Programs; Ben B. Balsley, Aeronomy Laboratory; Wilfred K. Klemperer, Lawrence R. Megill, Herbert H. Sauer, and Ralph J. Slutz, Space Disturbances Laboratory.

C&GS Pacific Tide Party Adds One Tide Station to Tsunami System

The C&GS Pacific Tide Party incorporated a new tide station at Marsden Point, New Zealand, into the Tsunami Warning System last month. The Party also inspected tide stations at Johnston Island, Kusaie, Majuro, Kwajalein, and Ponape.

School for WB Technicians Dedicated



Seated at upper left: Dr. George P. Cressman, WB Director; Roy L. Fox, Central Region Director; and Lawrence Eide, Acting Superintendent of the WBTTTC, listen as an Army Band performs during dedication ceremony..

The Weather Bureau Technical Training Center (WBTTTC)--an expansion of the National Meteorological Maintenance Training Center--was officially dedicated in Kansas City, Mo., May 5. The expanded facility will offer to Weather Bureau meteorological technicians and Bureau electronics and facilities technicians a number of classes designed to sharpen their skills in providing a variety of weather and weather-related services. Sixteen students selected from the regional offices are enrolled in the first weather service operations course for meteorological technicians, which began May 5 and ends June 4. Subsequent courses

are scheduled to begin July 7, September 8, and October 20. Donald Whitman heads the full-time, three-man teaching staff in the Meteorological Section.

The Center's electronics technician training curriculum includes 30 courses taught by seven instructors. These classes are scheduled to fit the demands created by new equipment and the need for highly trained maintenance personnel from the Weather Bureau, cooperating agencies, and foreign governments. Charles Webster is senior instructor for the Engineering Section. Acting Superintendent of the Center is Lawrence K. Eide.

C&GS Men Lauded for TICUS 1 Work

Six men who worked on the procurement, testing, and commissioning of an automated remote-recording tidal current measuring system have been commended by Rear Admiral Don A. Jones, Coast Survey Director, for "having seen the job through successfully." The system is known as TICUS 1, Mark 2. Commended were: Charles D. Kearse, Carl W. Reed, Donald R. Schmidt, and Thomas R. Bartholomew, all of the Office of Systems Development (C&GS); William F. Seibold, C&GS Ship Facilities Group; and Lt(j.g.) Lowell R. Goodman of the USC&GS Ship FERREL.

CSC Retirement Act Is 50 Years Old Today

The Civil Service Retirement Act, under which about 950,000 persons receive annuities, is a half century old today.

Four New C&GS Charts Available

The Coast Survey has published four new small-craft nautical charts for the Gulf Intracoastal Waterway on the west coast of Florida extending from Carabelle to West Bay.

Munson Attends Tsunami Warning Meeting

Capt. Robert Munson attended the second meeting of the Intergovernmental Coordinating Group/Tsunami Warning Group for the Pacific at the University of British Columbia, Vancouver, May 12-15. The first meeting was held in Honolulu in 1968. Captain Munson presented a report on International Tsunami Information Center developments during the last two years.

70-Year Record Is Crushed by Tornado

By JAY HARRIS
Avalanche-Journal Staff

It finally happened to Lubbock.

A savage tornado striking out of green soupy skies left death and destruction across a city that for more than 70 years had some how escaped terrible twisters which often dotted the area landscape. The scene was set during a late muggy afternoon when thunderheads built up south and southwest of the city.

By 7 p.m. reports of hail and scattered rainfall were coming in from rural communities only a few miles from the southern city limits. But no one was overly alarmed at the time.

By 7:30 p.m. the storm system had taken on a complete different hue and the Lubbock weather bureau was issuing a severe storm alert for hail across the counties.

Members of the Lubbock Firemen's association were playing host to a number of the city's news media at an annual dinner. Suddenly the word was flashed to City Manager Bill Blackwell and Fire Chief Herschel Sharp, who told them that the weather bureau radar had detected a hook—indicating a tornado cloud—in the storm which was building on the southeastern city limits.

The boiling purple, green and black clouds started moving slowly to the northwest, in itself an unusual direction for storm clouds in the Lubbock area.

Emergency personnel, city officials, and others were alerted to go to emergency operations command post in the basement city hall and other points as reports of baseball-sized hail on loop 289 and Parkway Drive started filtering in.

Police and Highway Patrol units drove into the center of the storm's fury shortly after 8:30 p.m. with several of them being stopped in their tracks by blinding rain and hail.

The storm moved little, but continued building and stirring for the next hour. The Weather Bureau placed the city and immediate area under immediate alert.

Around 9:30 p.m. the rain and hail which was little larger than golf ball-sized in downtown Lubbock seemed to slacken. Then about 9:40 the storm's southern

arm started moving across the heart of the city.

The winds spared much of hundreds of residences in the southern and southwestern parts of the town. By the time it reached the vicinity of 19th street and University Avenue the city was at its mercy—and in deep trouble.

Apparently the huge funnel started skipping across ground or roof top level headed straight for the downtown area.

Telephone and power lines snapped. Electrical arches shocked through the night sky. Pounding hail and rain accompanied the roar described so often by those who have lived through a tornado.

By the time the storm had reached Broadway and Avenue Q, it apparently was sweeping everything in its path.

The spiraling giant ripped service station signs, fronts of buildings and slammed into the off-duty fire and police personnel plus crews from the Lubbock County sheriffs' office, Reese Air Force Base, City of Lubbock and American Red Cross first aid and disaster experts pitched in to help.

Even just plain property owners, many of them with property damage and injuries—were pressed into service, directing traffic, watching devastated stores and helping in any way they could.

As the storm lifted, looting became widespread, but law enforcement officers were too busy shuttling dead and injured and attending to more important duties.

Businessmen were urged over emergency broadcast facilities to protect their own firms.

The northern half of Lubbock was a shambles.

Water was running knee-deep in many downtown sections.

A temporary morgue was established in Smiley Wilson Junior High School.

Attorney Bill Moss, working on the 10th floor of the First building, thought he heard a freight train.

"People say a tornado sounds like a freight train," he said, turning on his transistor radio. Hearing tornadoes were actually in the area, Moss headed for the basement. "The building started shaking and I took the stairs instead of the elevator. As I was going down, the stairs pulled several inches away from the walls," he said.

Parts of Southwest Lubbock, which escaped the storms' fury, were without electricity. Street and traffic lighting on 34th St. west of Ave. Q was out. Some damage to tree limbs was apparent in the area of Monterey High School, where LP & L Electricity shut off about 9:50 p. m.

The lights at the east side of Jones Stadium, which were erected for the Coaches' All-America football game in June and cost \$100,000 were down.

Hardest hit areas of the city included the area north of 34th St. and east of University Ave. to downtown Lubbock. Also hit hard was the area surrounding the airport and the country club addition.

"The looting started before the wind stopped," Lubbock policeman C. H. Cranford said. "Heaviest hit was the industrial area on Texas Avenue."

The L-spaced Texas Motel on north Ave. Q was demolished, the owner said, but everyone staying in the unit was evacuated. No injuries were reported there.

Memorial Baptist Church at 39th St. and Elgin Ave. was offering shelter to anyone who needed it late Monday night.

Shallowater, northwest of Lubbock, escaped tornado damage but hail and high winds knocked out all power at 9:35 p.m.

More than an inch of rain flooded the town, accompanied by golf-ball size hail. No injuries or serious damage was reported there, however.

The storm apparently touched down on the 2400 block of 19th St., building up intensity until it reached the center of the downtown area.

Trees were uprooted, limbs blown off and small buildings wrecked in the residential area east of the Tech campus.

Phyllis Freeland, who lives at 2319-B 14th St., said she and some companions were trying to get to a basement in the house next door when the storm hit.

"It sounded like a hurricane," she said. "The wind was blowing so hard, we could hardly stand and debris was flying all around."

Farther downtown, the damage was more extensive. Southwestern Bell Telephone Co. said 25,000 telephones were out along with 600 long distance lines.

Trees blocked 14th St. near Carroll Thompson Junior High School, and glass and bricks lit-

tered downtown streets. Some buildings were literally wrecked, while others seemed hardly scratched. Margaret's, one of Lubbock's most exclusive dress shops, was in shambles, while the Broadway Church of Christ across the street seemed to have weathered the storm with little damage.

Downtown, the First National Bank-Pioneer Natural Gas Building was virtually windowless, while a parking garage across the street, although flooded, remained intact.

First Methodist Church, also nearby, seemed to have sustained only minor damage, but it wasn't a completely good night for churches as the First Presbyterian Church in the 1500 block of 14th St. was wrecked.

Alongside the First National-Pioneer building, where drive-in booths were turned into twisted metal and piles of concrete, the Southwestern Bell Telephone building was also hard-hit. Windows were gone and debris, apparently blown from somewhere on the structure, covered the streets.

In contrast to the reports of looting, were the instances of people helping one another.

People came forward to assist anyone at all with a need, even if only for such a small thing as a dry match or a cigarette.

Newsman wading in knee-deep water and clambering over the debris from structures along the two blocks of Ave. J to Radio Station KFYO were hailed by Salvation Army personnel, driving a station wagon with its interior literally piled high with hastily constructed sandwiches. "No filet ever tasted better," said one bone-weary, sopping A-J staffer, biting into a plain bread and cheese sandwich.

Twenty of the injured were treated at Highland Hospital. The hospital's only vacant bed was filled about 10:30 p.m.

200 Injured In Hospital

George Brewer, administrator of Methodist Hospital in Lubbock said early today he had more than 200 injured at his hospital.

Congency plans were being made to transfer the injured to area hospitals unless the water and power shortages were solved.

Disaster officials were surveying the space situation at local hospitals at 2 p.m.

Damage to warehouses at West Texas Air Terminal north of Lubbock had caused sprinkler systems to start running, adding to the water depletion problem.

A Torn City Staggers Back After Vicious Tornado



SCENES COMMON THROUGHOUT CITY—Photos here are typical of tornado damage throughout the city. Destruction downtown was widespread while homes and businesses in outlying sections were ripped apart, in many instances complete losses. Hundreds of workmen labored through Tuesday and today, clearing debris in

an effort to get the city back to something resembling normal. These scenes were from widely scattered sections. (Staff and Associated Press Photos)

Lubbock Weather Log :

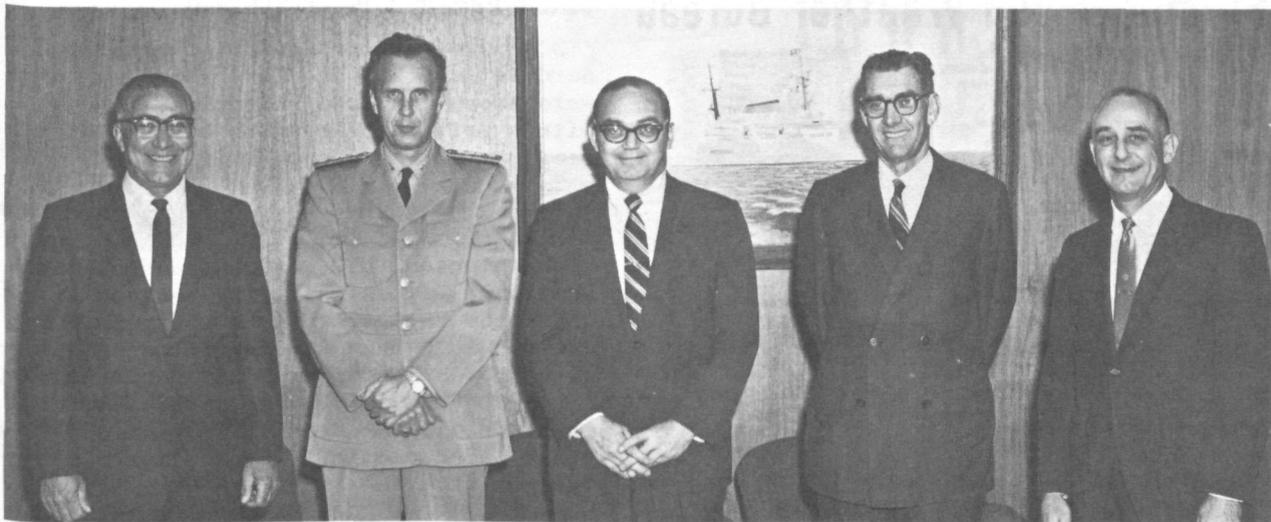
Staff issued warnings until forced to take cover

The following is a chronological resume of the important events and actions taken by the Lubbock Weather Bureau staff during the critical hours of May 11, 1970. All times are Central Daylight Time. The items marked with an asterisk (*) were entered on ESSA Weather Wire by the Lubbock staff.

1. 6:55 p.m. - LBB radar detected moderate thunderstorm 15 miles south of the LBB airport or about 5 miles south of the Lubbock city limits near the community of Woodrow.
- *2. 7:00 p.m. - Moderate thunderstorm with diameter of 10 miles indicated by LBB radar at 6:55 p.m. transmitted in LBB radar summary.
- *3. 7:30 p.m. - Revised forecasts for LBB and vicinity: Eastern half of Zone 21; Zone 22, and Southeast half of Zone 24.
4. 7:45 p.m. - LBB radar detected moderate thunderstorm 10 miles south of the LBB airport near south city limits with thunderstorm increasing in intensity.
5. 7:47 p.m. - Called Amarillo, Tex., (AMA) WBO via FTS and talked to radar man. AMA radar indicated TOPS near 46 thousand feet and increasing. 12/0000Z raob from AMA indicated a tropopause of 48 thousand feet and the tropo at 11/1200Z was 41 thousand feet.
- *6. 7:50 p.m. - Severe Thunderstorm Warning Bulletin issued for Lubbock, Crosby, Eastern Hale and Floyd Counties using quick action form. Long form of Severe Thunderstorm Warning Bulletin with specific details sent near 8:00 p.m. Also, Civil Defense was given warning via telephone. Switchboard operator was to notify Mr. Payne.
7. 7:52 p.m. - Marble size hail reported by Department of Public Safety to LBB WBO in 1300 block of 58th Street in Southeast Lubbock.
8. 8:05 p.m. - Public reported golf ball size hail 3 miles south of Lubbock city limits.
- *9. 8:08 p.m. - A severe weather statement was issued giving reports of public reporting golf ball to egg size hail three miles south of Lubbock city limits at 8:05 p.m.
10. 8:10 p.m. - Golf ball to grapefruit size hail reported by public to LBB WBO at 8:10 p.m. five miles south of the Lubbock proper...in vicinity of Lubbock Downs (about two or three miles south of city limits)..
- *11. 8:10 p.m. - Item No. 10 issued via Severe Weather Statement, Severe Thunderstorm warnings continued in effect for Lubbock, Western Crosby, Eastern Hale and Floyd counties until 9:00 p.m....
12. 8:10 p.m. - Funnel cloud seven miles south of LBB airport reported by off-duty police to LBB WBO.
13. 8:13 p.m. - Police reported to LBB WBO baseball size hail southeast part of the city of Lubbock.
- *14. 8:15 p.m. - Tornado Warning Bulletin issued for Lubbock, Western Crosby, Eastern Hale and Floyd counties until 9:00 p.m. Quick warning form used. Item #13 included with additional note that a hook formation was noted on LBB WBO radar WSR-1 at about the same time seven miles south of the LBB airport apparently moving Northeast.
- *15. 8:15 p.m. - Tornado warning including additional details on long form sent again via ESSA Weather Wire and relayed by phone to Civil Defense Director Bill Payne.
16. 8:33 p.m. - Public reported to LBB WBO baseball size hail vicinity of loop 289 and Aouff Road. This is about five miles south of airport.
- *17. 8:42 p.m. - Severe Weather Statement issued by LBB WBO included numerous reports of large hail reported in LBB area in past 30 minutes. Radar WSR-1 indications of hook at 8:40 p.m. five miles SSE of LBB airport.
- *18. 8:40 p.m. - Severe Thunderstorm Watch Bulletin #225 issued by Weather Bureau for all of South Plains valid until 2:00 a.m. CDT Monday night. Areal outline also listed.
19. 8:52 p.m. - Approximate time the Department of Public Safety reported funnel cloud observed three miles east of LBB city limits on Buffalo Lakes Road.
- *20. 8:59 p.m. - Tornado Warning Bulletin continued for persons in Lubbock, Western Crosby, Southern Floyd and and Southern Hale counties until 10:00 p.m.

(continued)

ESSA Officials/Admirals Hold Conference



Dr. R. M. White, ESSA Administrator (center), is flanked by Rear Admirals Don A. Jones, Harley D. Nygren, Allen L. Powell, and Norman E. Taylor.

ESSA officials and Admirals of the ESSA Commissioned Corps held a conference at ESSA headquarters, May 7-8, to discuss a variety of administrative matters, including future planning for the Corps. During the conference, participants were briefed on proposed activities and areas of responsibility. Attending were: Dr. Robert M. White, ESSA Administrator; Dr.

John W. Townsend, ESSA Deputy Administrator; Rear Admiral Harley D. Nygren, ESSA Associate Administrator; Rear Admiral Don A. Jones, Coast Survey Director; Rear Admiral Allen L. Powell, Director, Atlantic Marine Center (C&GS); and Rear Admiral Norman E. Taylor, Director, Pacific Marine Center (C&GS).

Lubbock Weather Log (continued)

21. 9:05 p.m. - Department of Public Safety informed LBB WBO of golf ball size hail vicinity of Farm Road 40 and 1729 (about six miles southeast of airport).

22. 9:08 p.m. - Public reported to LBB WBO baseball size hail at Holiday Inn East and Mackenzie State Park (about four miles south of airport).

23. 9:14 p.m. - Severe Weather Statement issued advising of latest radar report and recent reports of large hail in the LBB area. Mention of Tornado warning continuing in effect for Lubbock, Western Crosby, Southern Hale and Floyd counties included in this statement along with Item 22.

24. 9:15 p.m. - LBB WBO advised Department of Public Safety to notify Idalou Police to sound Tornado Warning.

25. 9:30 p.m. - LBB WBO advised Shallowater Fire Dept. via phone of severe storm five miles south of their area.

26. 9:35 p.m. - LBB WBO Radar WSR-1 indicated Tornado about seven miles

southwest of the LBB airport vicinity of 19th and Brownfield Hwy. This information was relayed by 2-way radio and telephone to Civil Defense. Sirens sounded at 9:35 p.m. Patrolman reported funnel in southern part of city about this same time.

27. 9:35 p.m. - Texas Zone Forecasts for Lubbock and vicinity, Zone 21, Zone 22 issued. Remainder of amended forecasts was to be issued after 10:00 p.m., but due to Tornado hitting downtown Lubbock, loss of communications at 9:49 p.m. prevented transmission.

28. 9:47 p.m. - LBB WBO reported to Lubbock Civil Defense last communications on hooks indicated on radar about 9:45 p.m. about five miles southwest of LBB airport.

29. 9:46 p.m. - Power failure at Civil Defense Headquarters.

30. 9:49 p.m. - LBB WBO lost all communications.

31. 9:55 p.m. - LBB WBO abandoned WBO to take cover from approaching Tornado.

Benedictine Sisters Honored By President and Weather Bureau



Left to right: Sisters Monica, Cabrini, Louise, and Julia, and Mr. Reinhold.

Sisters of the Benedictine Order in Pocahontas, Ark., were recently honored by the Weather Bureau for 75 years of weather observations. Since 1895, the Sisters of the Order have taken temperature and precipitation readings daily at their weather station. Robert C. Reinhold, meteorologist in charge of the Weather Bureau Office, Little Rock, Ark., presented the award "in grateful recognition of the Order's service to the Weather Bureau." Sisters of the Benedictine Order hold the longest weather observing record in the state of Arkansas.

President Nixon, in a letter of commendation to the Sisters, said:

"It has come to my attention that the Benedictine Sisters at Pocahontas recently completed 75 years of daily weather observations for the United States Weather Bureau. Yours is the oldest weather record in Arkansas and one of the oldest and most complete in the country.

"As you may know, recent developments in meteorology have given new importance to historical weather records. In addition to their usefulness for the study of long term climatological changes, the records are helpful in solving problems in agriculture and industry. It is a particular pleasure, therefore, for me to express my appreciation to you and your Sisters at the convent for your excellent service."

ESSA Scientists Confer With British Delegates on Environment

J. Murray Mitchell, Lester Machta, Bernard Zetler, and Lt. Cdr. Robert Swanson were among the U.S. scientists who met with a British Delegation on the Environment at the President's Office of Science and Technology, in April. The British delegation, headed by Sir Solly Zuckerman, England's Chief Scientific Advisor, was in Washington, D.C., to discuss selected environmental issues. The session in which the ESSA scientists participated covered long-term atmospheric changes related to carbon dioxide and particulates, consequences of Soviet diversion of river flow into the Arctic, and effects of tidal and geological changes, particularly involving the North Sea.

Cummings Honored for 45-Years' Service



John A. Cummings (left), meteorologist in charge of the Charleston, S. C., Weather Bureau Office, recently received a 45-year length-of-service award. Samuel Smith, Chief of Administration, WB Eastern Region, made the presentation on behalf of Silvio G. Simplicio, Eastern Region Director. Mr. Cummings entered the Weather Bureau in 1922 as an assistant observer at Macon, Ga. His other assignments were in Missouri, Tennessee, Texas, Utah, and Alaska, with transfer to Charleston in 1951.

National Oceanic and Atmospheric Administration

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Beltsville, MD 20704-1387
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