

## U. S. AIRWAY WEATHER STATION, CARBONDALE, ILLINOIS

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More than ever before does the present World War show the importance and need for a thorough knowledge and understanding of weather and climatic conditions. For a people to prosper and defend itself adequately today such a knowledge is essential. Although weather data are commonly used when planting crops; buying and selling goods; planning road itineraries; or properly heating a house, it took the present war to make all men really weather conscious. During the last decade through commercial and military aviation the "weather eye" public has increased with an accelerated tempo.

Wishing to help with this movement to understand weather, the writers will describe the operation of an Airway Weather Station, and show how such a station can contribute to the educational curriculum.

In April, 1940, a second class Airway Weather Station was established on the Southern Illinois Normal University campus at Carbondale under the supervision of the Geography Department. The Federal Government provided all the technical equipment and supplies while the Geography Department provided office facilities and personnel.

The station contains the following technical equipment: Mercurial barometer, barograph, anemometer and wind vane, wind velocity and direction indicator, maximum and minimum thermometers and holder, whirling apparatus for wet and dry bulb psychrometer, rain and snow gauge, weather shelter.

Before being permitted to take authoritative readings, the three observers selected to take readings had to pass a Civil Service examination and secure Certificates of Authority to take Airway Weather Observations. Two of these observers, Harry Chester and James Chandler are college geography majors, and the third, Thomas F. Barton, Chairman of the Geography and Geology Department, is sponsor of the station.

Every day, between 6:10 and 6:30 A. M. and P. M. and between 12:10 and 12:30 A. M. and P. M., weather observations are taken. Weather recordings are made, computed, coded, and telegraphed to Chicago in twenty minutes. From Chicago this information is made available by teletype for commercial and military airports throughout the United States.

For example at 12:29 P. M. on April 19, 1941 the following message was wired to Chicago in code:

43387 19403 08172 65502 66065 69217 67

The first three digits of the first group of numbers describes the location of the station as to latitude and longitude. The fourth number of the primary group shows that the sky was completely covered with clouds and the last number indicates that at the time of reading visibility was between six and twelve miles. In the same way the numbers in each of the following groups give a quantitative description of weather.

The following weather phenomena are observed, computed, and recorded at each six-hour reading:

1. Total amount of cloud
2. Visibility in miles or feet
3. Wind direction and velocity
4. Present weather (of which there are ninety-nine kinds)
5. Station and sea level pressure
6. Dry-bulb and wet-bulb temperatures
7. Dew point
8. Three hour station pressure change and pressure characteristic
9. Kinds of low, middle and high clouds
10. Cloud height and direction of cloud movement
11. Character, time and amount of precipitation or character and time of thunderstorm
12. Maximum and minimum temperatures.

At the end of each month four copies of the monthly weather summary are made. Of these, three are sent to Kansas City where one is filed, one is sent to the

Weather Bureau at Springfield, Illinois, and the other goes to the Weather Bureau in Washington, D. C. The fourth copy is filed for reference work in the Geography Department.

**Use of Weather Data.**—One of the most important elements of Physical Geography is weather. Almost everybody is interested in local weather conditions but most people believe with Mark Twain that nothing is ever done about the weather. However, at Southern the Geography staff members who use Finch and Trewartha's *Elements of Geography* as a text in the introductory course, are attempting to teach students how to describe, interpret and predict weather conditions. Consequently, by having weather readings every six hours, the Geography instructors have accurate local data to use in classroom presentations.

This information is also used in the college geography laboratory classes having as their objective the understanding of weather and weather instruments. Most students are interested in timely and local statistics that explain the weather drama as it is enacted. From local description and interpretation one can go on to broader generalizations on the subject. From the standpoint of weather instruments, in the laboratory or workshop there are various weather

instruments similar to those used in the station but differing somewhat in that they may be demonstrated from time to time.

Although not completely equipped at present the workshop contains the following instruments: mercurial and aneroid barometers, barograph, thermograph, hygograph, humidaguide, hand sling psychrometer, maximum and minimum thermometers, an indoor-outdoor thermometer, and a rain and snow gauge. Students are taught the mechanism and uses of each instrument as well as how to read it. After an understanding of the instruments is achieved practical functional problems connected with weather elements are studied.

The use of these daily reports not only stimulates interest in weather, but actual observation of the station itself also awakens in pupils a keen interest in weather problems in general. The station has been shown to rural, intermediate grade, junior and senior high school pupils, to college students and to "in-service" teachers. From past experience, one can safely say that most of these students, regardless of grade level, were impressed and stimulated by these trips. In fact, many have set up their own inexpensive weather stations, either at home or at school.<sup>1</sup>

<sup>1</sup> Barton, T. F., "Why Not Build an Inexpensive Weather Station at Your School?" *Illinois Education*, *Ibid.* "Establishing an Inexpensive Weather Station: An Abstract," *Journal of Geography*.