ular thing in Pretoria, in the hotter part of the summer, to see a group of cumuli formed over Johannesburg and the neighboring reef towns by noon, and nearly always most of the cloud rapidly changes to cumulonimbus, while Pretoria is bathed in the mid-day sunlight. These Johannesburg mid-day showers generally finish near their place of origin, the uprush apparently ceasing—a good deal of false cirrus generally remains with other debris. Then later in the day the top of a line squall is seen over the Johannesburg ridge and the line squall advances, usually becoming more continuous as regards the heavy rain portions and developing generally, as it comes, as related above.

Still the rainfall of Johannesburg is a little heaver than at Pretoria, apparently on account of the much more frequent mid-day showers and the heavier precipitation in the damp "easterly" type of weather which usually occurs for a short while in January and for other causes of less importance.

LONG-PERIOD METEOROGRAPHS

By S. P. Fergusson

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In view of an apparent renewal of interest in apparatus of this class it appears desirable to present a summary of available information concerning instruments that will function without attention through relatively long periods of time. Hitherto, almost all long-period meteorographs have been designed for use on mountains that could not be visited often or regularly; examples are the five-element meteorographs of the Janssen Observatory on Mont Blanc (4810 metres), the Harvard Observatory on El Misti, Peru, (5885 metres), and the Mount Rose, Nevada, Observatory (3293 metres), installed respectively in 1894. 1895 and 1909. The last-named instrument is still in operation. But such instruments are valuable wherever data in detail are desired in places where trained observers can not be maintained continuously, and in researches such as the intensive study of thunderstorms (urged by Symons and other authorities) in which may be used the records of a number of meteorographs suitably distributed.

As the name indicates, the meteorograph is simply a group of the familiar mechanisms of barographs, thermographs, etc., arranged to record their indications upon the same clock-cylinder, and the problem of maintenance is chiefly that of providing an ample supply of ink, adequate lubrication for anemometers, etc., and protection against injury from moisture, dirt, insects, etc. When the record covers only a few weeks or months, pens having perhaps ten times the capacity of the pattern used for weekly records and filled with an ink adapted to the conditions prevailing at the place, will be satisfactory, but, when the record must cover an entire year it may be necessary to employ other devices such as large closed pens or (if the elements are sufficiently powerful) small, soft leads such as are used in "Ever-sharp" pencils.

Metallic paper and pencils have been suggested, but can not be recommended; the friction necessary to cause a distinct trace is prohibitive. Ordinarily, the bearings of anemometers can be kept in good condition during long periods by the use of siphon lubricators which deliver an occasional drop of oil through a thread. Long-period clocks are not necessarily difficult to construct; fifteen-day and monthly cylinders for barographs, etc., are regularly manufactured and the "run" of the same trains can be extended indefinitely by adding the mobiles and stronger springs necessary. Variable friction, sometimes troublesome in a large number of mobiles, may be avoided by the use of the elastic train described in the *Monthly Weather Review*, July, 1921.

One of the most important improvements in meteorographs has been made possible by the invention of duralumin, "thermostatic" metal, and Mr. Friez's distance thermograph. Heretofore, in order to secure adequate exposure of thermometers and hygrometers, meteorographs have been placed in standard shelters where, particularly on mountains, the operations of changing records, adjusting, etc., often are accomplished under conditions most uncomfortable for the observer and more or less injurious to the instrument; but, now, the elements for humidity and temperature can be placed in a small shelter secured to the support of the anemometer at a convenient distance above the roof of a weatherproof shed containing the recording appartus. The construction of a meteorograph of this type is simpler than that of older forms, and the installation affords easy access to all parts as well as ample protection against injury from any cause.

Substantial contributions to meteorology could be accomplished by a more general use of meteorographs in research as well as for the purpose of maintaining continuous records.

FLORIDA DURING THE DROUGHT

Mr. A. J. Mitchell, Section Director, Florida Section, U. S. Weather Bureau, has sent us some information on how Florida fared during the recent unparalleled dry and hot season in the Southeast. While better off than the neighboring states (cf. Oct. BULLETIN, pp. 151-154) Florida's experience was not pleasant.

"It was the warmest September of record as well as the driest, except one. The mean temperature, 82.6 degrees, was 3.6 degrees daily above the normal; and it was the highest mean monthly temperature that was ever recorded for the Section, save August, 1915 and 1924, when the temperature was .1 of a degree to .2 of a degree higher. . . . The outstanding maxima for the month occurred over the interior of the western division, where individual stations recorded 103° to 107°, all being exceptional even for midsummer in Florida.

"The excessive heat and the abnormally dry weather during the current month were unfavorable for all crops, the only advantage arising from the absence of needed rains being the opportunity to harvest the cotton, corn, hay and the peanut crops in good condition. The dry weather was unfavorable for cane, sweet potatoes, strawberry plants, truck, citrus fruits and trees; the last named crop suffering quite seriously on some uplands, where fruit dropped and split; some leaves