A Science Service Feature

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? WHY THE WEATHER ?

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PILOT BALLOONS

As far back as the year 1809 Luke Howard, an English meteorologist, was in the habit of sending up small balloons to observe the movements of the air. About 25 years ago balloons of rubber or paper began to be used to a considerable extent for the same purpose on the continent of Europe. A few years later the process was improved by the addition of a theodolite, with which the balloon was sighted during its flight, and its angular positions were then noted.

A balloon used in this way is called a "pilot-balloon", and is the principal means of determining the direction and force of the winds up to heights of several miles above the earth. During the world war hundreds of thousands ofpilot-balloons were sent aloft on both sides of the firing line, mainly for the information of the military aviators.

The technique of pilot-balloon flights has greatly improved in recent years. In the practice of the United States Weather Bureau the balloon, which is of rubber, is inflated with hydrogen immediately before an observation. In this process it is attached to a balance which measures its "lift", and just enough gas is admitted to give the balloon an ascensional speed, under average conditions, of 180 meters a minute. After release, the balloon's angular position is read from the circles of the theodolite at the end of each minute. As its height is known at any time, the angles suffice to determine its distance from the place of observation.

The observer wears a telephone head-set and reports his readings to a recorder indoors. The latter, with the aid of a special plotting-board and a slide-rule, charts thetrack of the balloon so rapidly that within five minutes after the last sight is taken a report of the winds at various altitudes is ready to file in the telegraph office for the benefit of aviators and weather forecasters.

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