AERONAUTICS

Stratosphere Hop Experience Suggests Use of Robots

Automatic Radio Sets Sent Aloft in Small Balloons Transmit Upper Air Data; Might Have Wider Use

See Front Cover

STRATOSPHERISTS Kepner, Stevens and Anderson: Let us all hope that you have the chance to probe the stratosphere again. Although thrilled by your adventures, we hope next time you have a softer and slower landing.

While this elaborately planned National Geographic-U. S. Army flight is having its results written into aeronautic and scientific history, consideration should be given to the possibility of allowing robots, inanimate instruments that speak by radio, to undertake the hazardous task of rising higher than man can go to report on conditions in the stratosphere.

Smaller Cost

It costs relatively a few dollars and it risks no human lives to make free pilot balloon ascensions that may well break the Settle-Fordney altitude record. Light weight, efficient radio transmitters can be carried upward, varying their message according to the pressure, temperature and humidity they encounter. Radio transmitting balloons were successfully used last year in the Arctic to get weather information from high in the air.

Visits to the stratosphere could, in fact, become a daily occurrence. Lieut. W. H. Wenstrom of the Signal Corps, U. S. Army, has been making a study of radio sounding balloons at the California Institute of Technology and has indicated the feasibility of meteorological observations by use of such instruments.

A knowledge of the vertical distribution of pressure, temperature, moisture, direction and velocity of upper air winds is essential to "air mass" meteorology, and these data are expected to lead to precise weather forecasting.

Airplanes carry meteorographs recording pressure, temperature and moisture, are in general use. The direction and velocity of upper air winds are obtained by the use of free pilot balloons which are observed from the ground.

Airplanes carry meteorographs recording pressure, temperature and moisture, up to about 15,000 feet. On their return the data are evaluated and ready for transmission to weather stations within an hour or two after they are obtained. Occasionally a free sounding balloon carrying a recording meteorograph is used, but data can only be obtained when and if the balloon is recovered which may be days after the observations.

With the use of a free balloon to which a small radio transmitter is attached, pressure, temperature, and humidity even in the stratosphere can be obtained. The radio transmitter is ingeniously arranged so that the signal emitted is a function of pressure, temperature, and moisture. Bearings taken on the radio balloon in flight by one or more directional radio receivers on the ground will give its position at any time from which the height of the balloon and direction and velocity of the winds may be calculated.

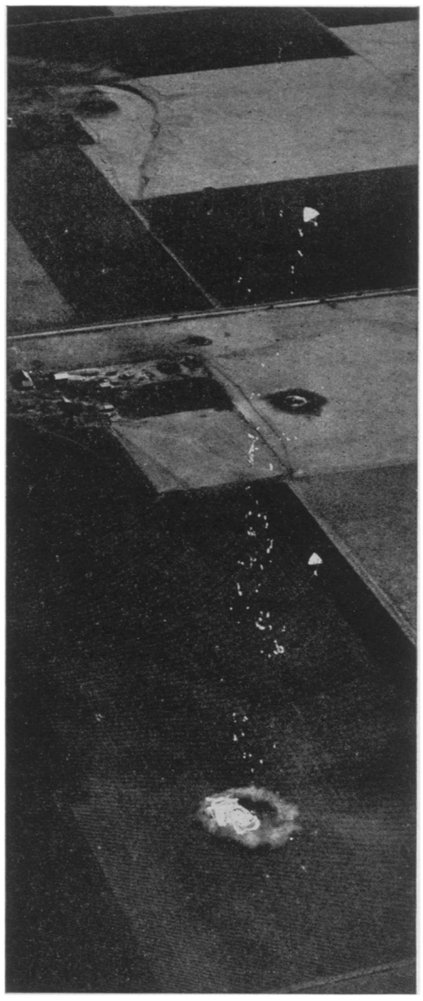
For Bad Weather

At present the cost of production of a radio sounding balloon exceeds the cost of an airplane flight, but Lieut. Wenstrom is very optimistic about the future use of radio sounding balloons. During bad weather when airplane flights cannot be undertaken, meteorological observations are most desirable. A radio balloon can be released in any weather and it will rise to much greater heights than could be negotiated by an airplane with an instantaneous reception of the data on the ground.

Larger balloons carrying more instruments could be sent to the stratosphere for a fraction of the cost of manned stratosphere attempts. The thrill of human life endangered would be lacking. Through repeated flights, through the constant ingenuity of scientists, the information to be obtained would undoubtedly equal and even surpass that which it was hoped to obtain in the recent valiant effort.

A supposed advantage of manned balloons over a sounding balloon for taking upper air data is that the former can be leveled off at different altitudes. In cosmic ray research it is helpful to have a series of readings every 1,000 or 5,000 feet. A sounding balloon rushes upward so fast that many automatic instruments cannot keep up with it.

A bit more thought on some method of dumping ballast at intervals should, however, make possible the desirable steplike flight in a sounding balloon.



WHEN THE GONDOLA HIT!

The crash of the stratosphere balloon "Explorer" at moment it hit the ground. The ring in center is one of dust created by the impact of gondola. Directly above and still in the air are the parachutes of two of the fliers. Between the parachutes are white specks of balloon fabric floating to earth. The farmhouse is that of Reuben Johnson near Holdrege, Neb. The epic photograph was made by Master Sergeant Gilbert from an accompanying Army plane piloted by Lieut. J. F. Phillips. The above photograph and that on the cover are copyrighted by The National Geographic Society.