AERONAUTICS

Stratosphere Fliers Faced Perils in Voyage to Upper Air

Of the Fifteen Who Have Attempted to Reach Man's Highest Altitudes, Only Eleven Have Come Back Alive

THE NARROW margin between the falling stratosphere balloon "Explorer" without fatality to its occupants, Major W. E. Kepner, Capt. A. W. Stevens and Capt. O. A. Anderson, and a disaster that might have killed the daring men emphasizes the hazards of stratosphere ascensions.

Despite the fact that stratosphere ascensions have been linked with governmental agencies and scientists from their inception and every effort made to foresee possible danger, the perils and risks of venturing ten, twelve or fifteen miles into the upper athmosphere hardly make the trip a joyride.

Beginning with Piccard and Kipfer and ending with the take-off of the recent flight, fifteen persons have gone into the stratosphere. All have come back, but only eleven have come back alive.

Prior to Piccard's 1931 flight with its record of 52,000 feet, the altitude mark for free balloons was 35,424 feet. Captain Hawthorne Gray, of the United States, made two attempts in 1927 to break it. His first record of 42,470 feet was declared unofficial because he descended by parachute. On his second trial he was killed. These flights were made in an open balloon, not a closed gondola.

While Piccard and Kipfer reached 52,000 feet in 1931, Piccard repeated the flight in 1932 with Max Cosyns as aid and gained an altitude of 54,166 feet.

Then came 1933—the stratosphere year. In April Commander T. G. W. Settle, U. S. N., received permission to begin construction of a balloon bag containing 600,000 cubic feet volume—100,000 cubic feet greater than the capacity of Piccard's bag.

At the same time Russian balloonists entered the stratosphere picture, to give the flights an international aspect, with plans to build a huge bag containing a volume of 800,000 cubic feet.

On August 5, 1933, to the accompaniment of a World's Fair celebration which lasted almost all night, Commander Settle took off solo but landed a few minutes later in the railroad yards of Chicago. The first "flop" had come into stratosphere flying.

Speeding construction and spurred by the preparations of Commander Settle, the Russian balloon was ready on Sept. 25, 1933. This bag, the U. S. S. R., failed to get off the ground that day, but on Sept. 30 reached an altitude of 62,324 feet. Although a record for altitude, the flight was unrecognized because Russia was not a member of the international aeronautical body sanctioning such flights.

Then in October news leaked out that Russia was planning still a larger balloon, the Sirius, with a volume of a million cubic feet. Before this new Soviet bag was complete, however, Commander Settle, accompanied by Major Charles L. Fordney, U. S. M. C., took off on Nov. 20 and came down the next day in a New Jersey bog after reaching 61,243 feet, an official record.

Up to 1934 the "box score" for stratosphere flights stood at four successes and two failures. Success came twice to Piccard, once to the U. S. S. R. and once to Settle and Fordney.

The year 1934, however, saw the turning of stratosphere luck from good to bad. The Russian balloon Sirius was ready on Feb. 1 and sailed away over fog-enshrouded Moscow. It came back with a record of 67,508 feet but in pieces and without its three occupants. The first fatalities had come to stratosphere ballooning.

Then, early in May, 1934, the German balloon Bartsch von Sigsfeld, engaged in the prosaic task of taking air samples near the bottom of the stratosphere at 32,800 feet, crashed with fatal results to its aerial occupant.

Ton of Instruments Carried

When the trio of stratospherists took off from Moonlight Valley on the National Geographic Society—Army flight, the gondola carried not only the weight of the three men, but also approximately a ton of scientific instruments. The gondola, built of magnesium alloy to be as light as it could be was nevertheless "trimmed" like a scientific Christmas tree with apparatus which covered the inside and outside and even hung by long ropes beneath.

What luck scientists will have in salvaging data from the twisted mass of instruments inside the gondola of the stricken "Explorer" is problematical.

Thirteen major objectives were outlined for the flight in addition to the unattained altitude record. They were:

1. Collection of stratosphere air samples at many levels.
2. Taking of complete temperature and barometric data from the ground to the highest point attained.
3. Aerial photographs to check curvature of the earth, also the customary barometric system of measuring altitude.
4. Cosmic ray data with both electroscopes and Geiger-Muller counters.
5. Wind velocity measurements.
6. Check of solar radiation intensity.
7. Photographs of the sun's spectrum.
8. Determination of ratio between sky brightness and sun brightness; color of sky at high altitudes.
9. Tests on actinic effect of light.
10. Effects of altitude on radio transmission.
11. Effect of radiation, both solar and cosmic, on fruit flies as check on possible mutations.
12. Same for spores.
13. Technical problems of balloon navigation.

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PHYSIOLOGY

Test of Saliva Detects Intoxication

A SIMPLE test of saliva may come into use as a means of telling whether a person is intoxicated.

A method of determining the amount of alcohol in the saliva after alcoholic beverages have been drunk was reported by Dr. Theodore E. Friedemann of the University of Chicago to the Society of Biological Chemists. Dr. Friedemann found that after drinking, the alcohol finds its way as quickly to the saliva as to the bloodstream and in some cases even faster.

This means that it will no longer be necessary to take a sample of blood from a man's vein to determine the amount of alcohol in his system. Testing for alcohol in the blood is sometimes resorted to in settling questions of drunkenness.

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