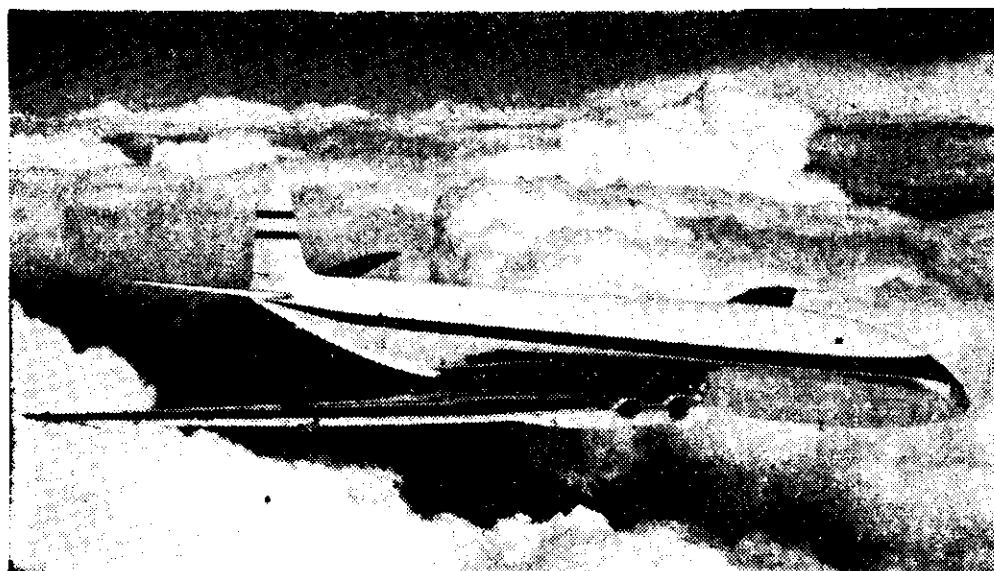


# THE RIDDLE



## of the Stratosphere

**F**LYING with the scientific care, the skill and the courage of their kind, two British test pilots are reported to be trying to solve a riddle of the stratosphere—the riddle of the Comets. One of them, Group Captain John Cunningham, has said of the attempt: "All we can do is to take the aircraft up again and again under the conditions in which the last two crashed. I shall have the radio-telephone on all the time and if anything happens we should be able to tell them on the ground."

The implications of this modest statement will cause many to keep an anxious eye on the news in the coming weeks. What may these courageous men find in the skies of southern England? Will they discover the quirk of nature or man or machine which caused the recent Comet disasters? Is the whole future of jet aviation in jeopardy?

On the basis of the sketchy available evidence a number of theories about the cause of the crashes have been advanced. None is entirely satisfactory. It is possible even that the cause lies outside the scope of aeronautics: the disasters may not have been accidents. A theory advanced by London's *Daily Telegraph*, and supported in some measure by such experts as the jet inventor Sir Frank Whittle, is that the Comets were subject to sabotage.

Certain aspects of the two recent disasters lend disturbing support to this theory. There are, in fact, common factors with the crash of the Star Ariel, the second of two Tudor aircraft to disappear without trace, and with a near-disaster which befell a BEA Viking. These factors are:

- (a) All four incidents occurred over water.
- (b) All occurred about the time the radio operators would be changing frequencies.
- (c) No indication of any trouble was received from the planes.

The Viking incident provides the only clear indication of what these factors may mean. The aircraft was flying the London-Paris route in 1950. Over the Channel, the radio operator indicated he was changing frequency to get in

touch with the control tower of his destination. As he did so, a bomb in the plane's lavatory exploded. The pilot turned back and succeeded in landing the plane at Northolt airport with the rear end of the fuselage almost blasted off.

The inference drawn from this incident was that a bomb containing a small radio receiver coupled to a detonating device was placed in the plane. The receiver was tuned to the frequency to be used by the Viking's radio, and, as soon as the operator changed over, it set off the charge. Such a bomb would be more useful to a saboteur than a time or altitude bomb, as it would not function in the event of the plane returning to base immediately after take-off. This occasionally happens because of some mechanical defect that must be immediately rectified.

At the time of the Tudor crashes there was no mention of a radio-frequency bomb, but an examination of the aircraft, rivet by rivet, failed to reveal any defect. About the time the Star Tiger and Star Ariel crashed, the Tudor was regarded as a fine and very promising aircraft. It was taken off passenger runs because nothing could be found wrong which could have caused such sudden disaster as the evidence indicated.

In determining the causes of these unexplained accidents it is necessary to think of something which happens so suddenly that there is no time for any action to be taken or message sent. Reports indicate that victims recovered from both Comet crashes had no time in which to register fear or pain. There are indications, too, that all were dead before they hit the water. According to newspaper reports they were extensively injured about the lower limbs, and, in the case of the Elba crash, chemicals were imbedded in the skin of the backs of the legs. All these things are consistent with an explosion in the back of the aircraft.

There are, of course, other possible accident causes. It has been suggested that an explosion of the aircraft's belly-tank, a sudden failure of pressurisation, or the disintegration of one of the jet engines could have been responsible. In

view of the safety requirements in design, the first is most improbable, and, after the Comet crash at Karachi last year, the tank was found intact. The second possibility—that of "explosive decompression" due to structural failure—could have sudden and violent effects. The planes' occupants would lose consciousness, at higher altitudes, in a matter of moments. However, it is a rule that the second pilot must wear oxygen equipment constantly. In the event of an emergency he could have brought the aircraft safely back to earth. The chance of the jet turbine rotors flying apart has never been treated lightly. It is the principal reason the Americans design their aircraft with the jets housed in pods under the wings. But, so far, no accident of this

kind is known to have happened, and the possibility of its happening to two planes of the same type in the space of a month seems unthinkable. The second Comet had, in any case, been safeguarded by the shielding of its engines with armour-plating. And, even if the jet engines had flown apart, they would be unlikely to cause *instantaneous* disaster. The effect would certainly be disastrous, but it would probably take at least a few seconds, particularly if fragments from the disintegrating rotor did not immediately enter the fuselage. The chances of their doing so involve only a segment of the rotor's 360 deg. rotation.

In addition to these hypothetical faults in the aircraft, the theory of unusual atmospheric effects cannot be discounted. The pilot of a B36 bomber travelling probably about 350 m.p.h. has reported seeing a meteorological balloon—above him and apparently caught in a jet stream—rapidly outdistancing his

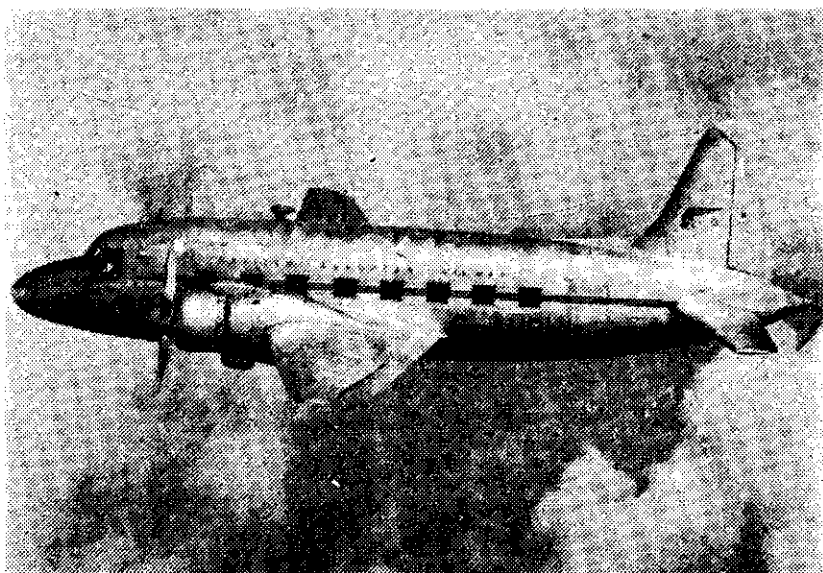
aircraft. Between two such streams there could be dangerous turbulence. This is thought by some to be the cause of the phenomenon known as clear-air turbulence. It has been reported from an airliner flying over the Atlantic in completely clear air. Experiments concerning its effects have been in progress for several years and results to date indicate that it is unlikely to cause structural damage. The question of fatigue is, however, a large one. An aircraft at Farnborough—in fact, a Comet—has been for some time in the process of being systematically shaken to pieces to discover the safe fatigue-life of its components.

In spite of these possibilities, however, superficial appearances seem to strengthen the *Daily Telegraph* theory. Jet aircraft of the R.A.F. and other air forces daily fly in altitudes and conditions similar to those in which the Comets operate, but have encountered no similar run of mysterious disasters. The weapon suggested could be easily made and easily secreted in a plane. Work has to be done on aircraft by numbers of people, and it would be patently impossible to have two or three people checking the actions of every one. Men have even successfully stowed away in large aircraft, and, that being possible, it would be comparatively easy to hide a small bomb.

Whatever the true explanation for the Comet crashes, it is difficult to see what the volunteer test pilots can do that they have not already done numberless times. Before going into service, the planes were tested exhaustively in every possible attitude, altitude and condition of loading. In addition, BOAC alone has had 12,000,000 miles of service operation from the Comets.

Two Comets have been reported as undergoing the tests. One is being piloted by Group Captain Cunningham, who is chief test pilot for the de Havilland Company, and who has had 1300 hours Comet flying, and the other by an unnamed R.A.F. pilot operating from the research station at Farnborough. Each plane will carry a co-pilot and an engineer. On the success or failure of these men may rest not only the prestige of British aviation, but also the whole future of jet aircraft development.

—STAFF REPORTER



VIKING aircraft of the same type as the one which was damaged by a bomb explosion while flying from London to Paris