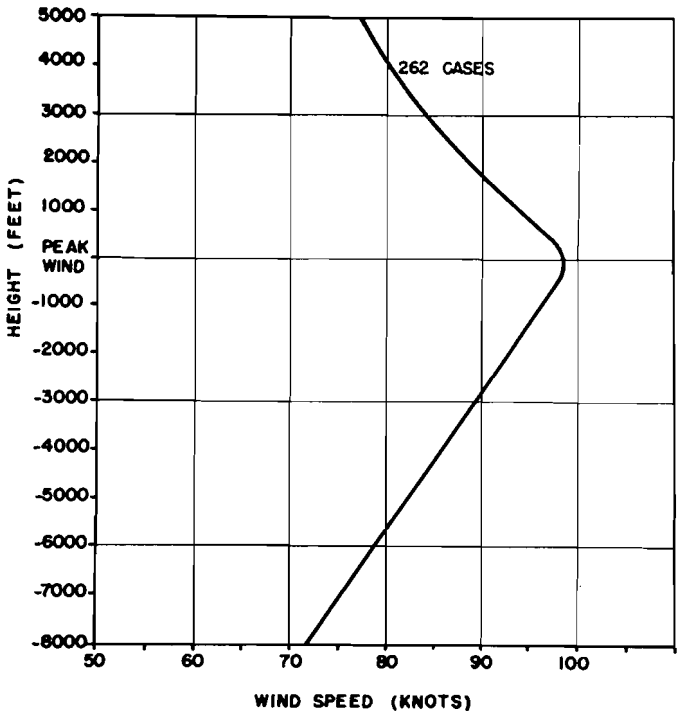

Fig. 3 (Right) — *Average vertical Jet Stream profile over USA. according to 262 Rawin observations (after Endlich and Solot). Vertical wind shear above Jet Stream core exceeds that below.*

Fig. 4 (Below) — *Average horizontal Jet Stream profile based on 42 flights on "Project Jet Stream" aircraft B-47 and B-29 (after Endlich and Solot). Horizontal wind shear immediately North of Jet Stream core exceeds that in the South and increases towards center.*

useful set can be highly recommended for glider contest work. A two-channel version will be used in 1955.

The task, which will be resumed shortly, is two-fold:

(1) The exploration by gliders, of vertical motions in the jet-stream and of such phenomena as the above-mentioned cirrus bands, moving waves, jetlets, pulsations and high level turbulence is of greater value to flight operation if their preferred location can be determined in the *overall* picture of the jet-stream. The latter is the current task of the B-29 and B-47 of the "Project Jet-stream" which traverse the jet-stream between 30,000 and 40,000 feet from their Florida bases. This field-work is directed by Mr. R. Rados of the Geophysics Research Directorate who was with us at last year's flights in the Bishop area. It is planned that the two aircraft will explore the structure, exact position and intensity of the jet-stream over the Western United States and determine how the large scale jet-stream pattern is modified by great mountainous areas such as the Sierra Nevada and the Rockies. Last spring it could be observed how the long, thin cirrus bands originate in the lee of mountains and trail downwind over great distances. This had been first suggested by Robert Symons of Bishop, California.

The formation of so-called "jetlets" was observed twice, which seemed to travel across the jet-stream in minor upper air troughs. In one case the double theodolite PIBAL of Bishop plus a series of pictures by Harold Klieforth of U. C. L. A. and a lucky launch of the Pratt-Read right into this jetlet gave approximate quantative data. In a matter of hours this westerly jetlet traveled south over the Sierra Nevada with wind velocities of about 120 knots at its center at 32,000 feet and a drop to 70 knots on both sides, total being about 50 miles. This was the flight described by Victor Saudek which terminated in Las Vegas after a height of 35,000 feet was reached easily in the jetlet core. In this core the mountain waves seemed to blow up to great intensity and the wave cloud picture allowed observers to follow the southward travel of the jetlet optically from the ground.

There is one more thing that we would like to look into. A recent investigation by the Geophysics Research Directorate (H. Lake) of 600 aircraft reports on high level turbulence collected during 3 days over the U. S. A. indicates that clear air turbulence develops in "stable" areas which are favorable for gravity and inertia waves. The exploration of such periodic motions and their growth to turbulence may give a clue to this still obscure phenomenon.

Of course the long-range aircraft of the "Project Jet-stream" have more chances to encounter such pulsations. But they run into the well-known difficulties of high wing-loading powered aircraft, to measure vertical motions. Also, such work should not interfere with the other tasks which these aircraft have to accomplish and it should make use of the already existing elaborate instrumentation. The fact that the expected wave lengths are of at least the same magnitude as the mountain waves (which are stationary gravity-inertia waves) and that the air speed recorded in these aircraft is extremly accurate, suggested a particular procedure of exploration. This brings us to the second task of our field work in 1954 and 1955.

(2) Calibration of the "Project Jet-stream" aircraft by gliders.

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