

Notwithstanding this, an R.A.F. flyer in a Spitfire shot down a JU-86 last November from above 40,000 ft., while two others scored victories over Junkers planes flying at 50,000 ft. although the men were virtually paralysed by cold.

To appreciate flying at such heights we must begin with the fact that at sea-level we live in an air-pressure of 14.7 lb. per square inch; in other words, we have about 30 tons of air holding our bodies together. But at an altitude of 40,000 ft. it drops to a mere 2.17 lb. per square inch, meaning that the air is six times as "rare" as at sea-level. Which complicates everything. For example, a 1,000 horse-power engine tuned for sea-level won't deliver 200 h.p., at that height. And since a man's "carburettor" can't function any better than an engine's on such a thin diet of oxygen, the first hazard of the Flying Fortress crew is anoxia, or "oxygen starvation," a threat virtually eliminated by the elaborate but fool-proof oxygen equipment provided.

Much like intoxication, anoxia first dulls the senses, then affects the judgment; consequently you are blissfully unaware of your condition as you go from bad to worse. After one-half hour at 18,000 ft. the typical victim's faculties are sadly impaired, yet he is feeling great. He can't do simple arithmetic problems; his handwriting deteriorates into a scrawl, yet he'll be making silly faces at nothing and giggling like a schoolgirl. If you stay at 18,000 ft. for more than a half hour (without oxygen) you begin to see double and you are so deaf you can hardly hear the motors roar; so ossified you can drive an ice pick through your hand and hardly notice it; so senseless you can't distinguish between the tastes of mint and onion. Fits of boisterous laughter or blind rage may seize you. On an early test flight to 20,000 ft. without oxygen, one fellow was on the verge of killing the pilot because the latter's red neck infuriated him beyond reason. The only thing that saved the pilot's life was the fortunate fact that the passenger couldn't find a weapon with which to bash in his head.

You can't even whistle

Up to a certain point anoxia can be combated by breathing oxygen from an ingenious face mask connected to a supply tank. Thus, at 10,000 ft. the flyer will adjust the valve to give him 30 per cent. oxygen, making up for the deficiency in pressure. At 20,000 ft. he will increase the ratio to 50 per cent.—at 33,000 ft. he will have to breathe pure, 100 per cent. oxygen.

From here on up, however, even 100 per cent. oxygen is not sufficient in itself; it must be administered under pressure so as to drive it into the blood stream. This means either a pressure suit or a pressure cabin such as is used on the Boeing Strato-liners with such success. It is this lack of pressure which makes it impossible to whistle (there being no back-pressure against the lips); or which pitches male voices so high.

Not only must oxygen be available for men at their fixed posts, but also for those moving about the ship and, in an emergency, for those who may have to resort to their parachutes. Each Fortress crewman carries his own "bailout bottle" containing a 15-minute oxygen supply. If he has to "hit the silk," he will disconnect himself from the main tank and slip on his emergency mask (worn around the neck) which is hooked up to a 2½ lb. bottle in his trouser leg.

Another worry of the Flying Fortress crews is aeroembolism or "stratosphere bends." Caused chiefly by the release of nitrogen bubbles in the blood stream and tissues, the simplest analogy is the way ginger ale fizzes when you uncap the bottle; the room pressure being lower than that in the bottle, the gas escapes in bubbles.

You become a Ginger-ale Bottle

In a rapid ascent to 30,000 ft. the human body virtually becomes a bottle of ginger ale, and as outside pressure decreases, nitrogen in the blood turns to bubbles. Generally unnoticeable at 18,000 ft. they get so big at around 30,000 ft. that most people suffer from them, and the agony may become unendurable.