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? WHY THE WEATHER ?

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AIR DENSITY AND HIGH FLYING

Much confusion is caused in the public mind by the conflicting reports issued as to the altitude reached in record flights or in flights in which attempts are made to establish new records. These barometric "heights" are subject to considerable error. An altimeter does not really measure altitude, but only air pressure. Two variables, pressure and temperature, enter largely into the determination of altitude; and corrections for temperature are generally based on an inadequate formula.

Every airplane has a definite density "ceiling"; it cannot fly in air of less than a certain density. The level at which this density will be reached will depend upon both pressure and temperature. The limiting density will be actually highest over hot regions in summer where the air is vertically expanded. In such places airplanes can rise to the greatest altitude. In winter, paradoxically the altimeter may indicate a greater height, though the plane is actually lower. For in winter the air is contracted and nearer the surface, and a low pressure is sooner attained. Since the air is colder the airplane can fly in a lower pressure than in summer, because the colder the air at a given pressure, the denser it will be. Hence the altimeter shows a very low pressure, at times corresponding to that usually found at several thousand feet higher than the greatest height ever attained, yet without establishing a new record.

(Tomorrow: Rivers of Fog)

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