

the upper air currents. At the late international meteorological congress held at Paris it was decided to make cloud measurements during the coming year. At each international bureau, daily if possible, two observers at the same instant from fixed points, being at the ends of a measured base line, take observations on the same point of a cloud, and within two minutes again on the same point. This is about the longest time that a given point will remain identifiable.

In another manner the nature of the upper strata of the atmosphere is being explored by means of kites. They are flown tandem, i.e., several kites on one string or rather fine steel wire, as the latter is far more suitable. Self registering instruments are attached to the kites.

Of the observed phenomena of the dynamics of the atmosphere up to the last century none impressed itself so much on physicists as being subject to law as the "Trade Winds." Experience had shown navigators that once they got their ships into the paths of these regular winds, they could be depended on with almost as much confidence as we now place in steam. The primary cause of the atmospheric motions is the unequal distribution of the temperature on the earth's surface produced by the solar heat. We know from observations that there is a large, but not constant, difference in the temperatures of the air at the poles and equator, amounting, at an elevation of but a few feet above the earth's surface, to about 81° F. for the average for the entire year. The heating up of the air at the equator causes its expansion, and consequent increase of bulk, but does not increase its weight or pressure at the earth's surface, it does however elevate the successive isobaric surfaces, i.e. surfaces of equal pressure, and this causes differences of level or gradients, which cannot exist in fluids without a motion ensuing in the direction of the lowest level. The levels of these gradients are measured with our atmospheric sounding rod, the barometer.