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# NOTES, ABSTRACTS, AND REVIEWS.

## THE CLASH OF THE TRADES IN THE PACIFIC.

By C. E. P. BROOKS and H. W. BRABY.

[Abstracted [1] from Quarterly Journal of the Royal Meteorological Society, Vol. XLVII, No. 197, January, 1921.]

The area considered lies between latitudes 5° S. and 12° N. and between longitudes 150° W. and 150° E. Regular observations were taken at several small islands and, in this study, were supplemented by mean values for the open ocean, published on the pilot charts of the United States Hydrographic Office. The discussion is based principally upon conditions prevailing during the period January to June. East of 180° longitude the Trades meet at a small angle and moderate rainfall occurs. Most of this rain falls with a NE. wind; the explanation seems to be that the SE. Trade, being warmer, rises over the NE. Trade. [Query: Does this SE. Trade continue northward as the antitrade?] Occasionally rain occurs with a westerly wind. The reason for this is not clear, but the authors suggest that the westerly winds may be produced by eddies and are therefore local in character. West of 180° longitude the Trades meet at a large angle, almost at right angles, in fact. They do not differ materially in density and therefore mix and form a great mass of rising air. As a result heavy rainfall occurs, much heavier than farther east. The belt along which the Trades meet is of course one of low pressure, with lowest values in the west, where the angle between the two wind systems is large. The exact location of the lowest pressure varies, and it is found that the amount of rainfall is closely associated with the movements of this "mobile center of action." When it is located well to the west, dry weather results; when it moves eastward, increasing rain occurs.

In an addendum the authors point out the parallelism between the "Equatorial Front," formed by the meeting of the Trades, and Bjerknes's "Polar Front," but remark that the former never has the wavy form or the undulating motion, both of which are characteristic of the latter.—*W. R. G.*

[1] For other abstracts see *Nature* (London), Nov. 25, 1920, p. 425; *Meteorological Mag.*, December, 1920, p. 248.

## RECOVERY OF SOUNDING BALLOONS AT SEA.

The recent addresses of His Serene Highness, Albert I, Prince of Monaco, before the American Geographical Society in New York City and the National Academy of Sciences in Washington, in which he discussed the aerial soundings made from his yacht, the *Princesse Alice*, recall the interesting methods employed in recovering the instruments which have ascended to high altitudes and descended again to the surface of the sea. The methods employed in making sounding-balloon ascents at sea consist essentially in sending aloft two balloons in tandem, one more fully inflated than the other. Below hangs the meteorograph and below that a float which, upon returning to the surface, acts in conjunction with the balloon, to keep the instruments above the water and to signal the location of the apparatus. The more fully inflated balloon bursts, thus allowing the other balloon, instruments, and float to descend to the surface of the sea. But how is the location of the apparatus to be determined?

This question was answered in a simple and quite satisfactory manner by Ensign Sauerwein of the *Princesse Alice*.[1] By charting the course of the ship upon the map, and by noting with a theodolite the altitude and azimuth of the balloon, it was possible to determine with precision the distance from the ship of a vertical dropped from the point where one of the balloons burst. In order to ascertain the point where the other balloon will reach the sea, one must know the altitude of bursting, the rate of descent, and the winds at all levels traversed. Of these three factors, the first can be computed from the rate of ascent of the balloon, a matter to be determined by experiment, and the time of bursting can be observed through the theodolite; the rate of descent can be quite accurately computed by knowing the weight of the apparatus and the resistance of the falling mass; the winds encountered on the descent are assumed to be the same as were encountered on the ascent, which is to say that the direction of the point where the balloon will touch the surface is in the same direction as the resultant line joining the starting and bursting points of the balloon. It should be remembered, of course, that the vessel must steam in the direction the balloon is traveling, and thus be able to retain the balloon in sight under ordinary conditions for the entire flight.

It is recognized that this is only an approximation, but the objections which can be raised against it on such a score are answered by the significant fact that the scheme works, and has been successfully employed by the investigators above mentioned. Cloudiness, obviously, introduces difficulties. The balloon when riding above the waves is a conspicuous object, for it usually stands from 100 to 150 meters above the surface and is painted a conspicuous color, thus rendering it visible for many miles. De Bort remarks that in general the above method was sufficiently accurate to bring the ship within 7 or 8 miles of the point of descent, a limit within which the balloon was easily visible. It was only necessary upon sighting the balloon to steam toward it and, with a specially prepared hook, catch hold of the light cord and draw the apparatus aboard the vessel.—*C. Le Roy Meisinger.*

[1] S. A. S. le Prince de Monaco: Sur les lancements de ballons sondes et de ballons pilotes au-dessus des océans. *Comptes Rendus*, Sept. 11, 1905, pp. 492–493. This method of recovering balloons at sea was also used about the same time by Teisserenc de Bort and Lawrence Rotch. Cf. Étude de l'atmosphère marine par sondages aériens Atlantique moyen et région intertropicale. *Travaux Scientifiques de l'Observatoire de Météorologie Dynamique de Trappes*, Paris, 1909, pp. 49–50.

## SIMULTANEOUS VARIATIONS OF TEMPERATURE AND WIND SPEED ON THE EIFFEL TOWER.[1]

By R. DONGIER.

[Abstracted from *Comptes Rendus* (Paris Acad.), Mar. 14, 1921, pp. 699–701.]

By an analysis of the temperature and wind observations made at the several stages of Eiffel Tower and at the Bureau Central, it is found that there are times when there are very rapid successive fluctuations of temperature at the top of the tower accompanied by similar fluctuations of wind speed. The wind suddenly increases from gentle to almost squall force, there is a drop of humidity, and the temperature fluctuates, as noted above. Upon investigation it is found that there is a cold surface layer being overridden by a warmer wind of greater force. There is no mixing of the air, but the

[1] Les oscillations simultanées de la température et du vent au sommet de la Tour Eiffel et leur relation avec la surface directrice (Bjerknes) d'une dépression.