way implies an amendment of the system used for wind, but merely introduces, as required by development and progress, a uniform scale for checking and educating observers in estimating. In addition, the non-initiated are given an accurate numerical measure by which they can train themselves in estimating the wind even without personal assistance or apprenticeship.

If we ever wish to reach a definite practical result in this so important and so frequently raised question we can, and wish. to, take a stand by saying :– Estimates of wind of force 1, 2, 3 to 12 are correct when they agree with the velocity figures of 1, 3, 5 to 33 m/s (line 2). If the m/s refer to the movement of the air at the estimated position (height), we thus become independent of the configuration of the ground and the height above it. We lay down even that :– The Beaufort Scale, line 1, is equal to line 2 in m/s, and all estimates of force — particularly since the invention and use of the anemograph — should be based thereon.

Seamen afloat and meteorological observers on land, by their estimates of wind force during centuries, have provided the bases for this standardisation and these valuable bases should be preserved to them and their posterity in observations and records in such a way that neither time nor generations shall change them. By thus faithfully preserving them in mathematically accurate measurements, of great value to international intercourse, we would best pay homage to the experience and work of all the old observers and seamen.

To make the table more complete I have added the pressure, in kg/m^2, exerted by wind of various velocities on a fixed object. These pressure data, line 9, however, are not standard values.

Generally speaking, it is only in building work that the maximum values of wind pressure are of importance; the old official values of wind pressure of 100 kg/m^2 and 150 kg/m^2 respectively, according to height above ground, are still valid as such.

There are no specifications as to the form of the surface acted upon by wind but, Ministerialrat (retired) BUSCH, an expert, informs me that, at present efforts are being made to determine a change in the old specifications in order to adapt them to recent advances in the knowledge of this subject. According to this, the static pressure should be taken as :–

$$q = \delta \frac{v^2}{2} \quad \text{or} \quad q = \frac{1}{16} v^2,$$

if the density of the air δ be assumed to be 1/8; the maximum values of this static pressure would probably be from 800 to 1000 kg/m^2 in practice. Account would be taken of the shapes of the buildings by multiplication by the coefficients determined by observations of models in wind-tunnels.

MAPS VERSUS CHARTS.

(Extract from *The Military Engineer*, Washington, D.C., Sept.-Oct. 1935, page 400).

There has been confusion in the minds of some map users concerning the designations "maps" and "charts". To some the name "map" is synonymous with "chart". To others there appears to be a difference but they find it hard to define. Perhaps comparatively few have given the matter any thought whatsoever, accepting a map or a chart for their purpose at its worth.

In order to clear up doubts concerning differences between maps and charts, the following article by Thoburn C. LYON, of the Coast and Geodetic Survey, published in a recent number of *Air Commerce Bulletin*, may be of interest. The title of the article is "Airway maps now called Aeronautical Charts".

"Probably all pilots are familiar with the sectional airway maps published by the Coast and Geodetic Survey for the Bureau of Air Commerce. Recently the designation of this series was changed to sectional aeronautical charts, and some of the reasons for this change may lead to a better understanding of their nature and purpose.

As commonly understood, a map is primarily concerned with the land; a chart with the water, especially in its relation to navigation.

The early air maps were little more than topographic maps showing the relative position of details of the terrain. With the coming of improved aircraft and advanced methods of air navigation, however, these publications have undergone a gradual development.

The aeronautical chart of to-day can no longer be considered as merely a map — it is a navigational instrument differing in many details from an ordinary map. Features that once were considered essential have been replaced with others of greater relative importance. Certain items which should be included in a topographic map are now omitted in order not to obscure detail of more value to the navigator; other features are exaggerated beyond topographic justification because of their landmark value. Finally, the addition of the highly developed system of aids to air navigation has made the aeronautical chart exactly comparable to the nautical charts so essential for safety at sea.

Nautical charts are designed to show not only the harbours and channels, but also the complete system of lights, buoys, radio beacons, and other aids which enable the mariner to determine his position and reach his destination safely, even under conditions of poor visibility. Of at least as great importance is the charting of shoals, rocks and other obstructions. Soundings are selected so as to show the extreme variations in depth and the contour of the ocean is developed by depth curves, or shading.

In the aeronautical chart, exactly the same elements are present. The airports and established airways are shown, together with the system of beacon lights, radio range stations, and other aids which enable air pilots to determine position and safely complete scheduled flights even with zero visibility. Here, as at sea, the charting of mountain peaks and other dangers is of equal importance. Elevations take the place of soundings, and the characteristics of the floor of the "air ocean" are developed by means of contours and other conventional symbols.

The distinction that a chart is primarily connected with water areas largely disappears when we realise that the chief difference between air and water is one of density, or specific gravity. The air ocean is just as real as the water ocean, and is just as substantial at air-liner speeds as the water ocean beneath the keel of a battleship.

The aeronautical chart is in reality a navigational instrument representing the bottom of the air ocean.

Maps in general may be looked upon as containing information which is subject to little change, even over a considerable period of time. By way of contrast, the aeronautical charts include more than 2,000 airports and landing fields and some 20,000 miles of fully equipped airways. With such an extensive system of aids to air navigation it is obvious that many changes must occur; new airways are being established and old airways rebuilt with improved equipment, for more efficient operation. Changes of this nature are so numerous that new editions charting these changes are necessary at frequent intervals".

THE DEEP-WATER CIRCULATION OF THE INDIAN OCEAN

by

A. J. CLOWES and G.E.R. DEACON.

(Extract from *Nature* - London, December 14, 1935, page 936).

Until very recently, it has been generally assumed that the deep-water circulation in the Indian Ocean was very similar to that of the Atlantic; in certain features, such as the Antarctic bottom current and the Antarctic intermediate current, the close resemblance between the two oceans is still undisputed. It has, however, been suggested that the North Atlantic deep current — the highly saline deep current which MERZ and WÜST (1922) showed to flow southwards between the intermediate and bottom currents in the Atlantic Ocean — has no parallel in the southern part of the Indian Ocean.