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INTRODUCTION.

The Summary for the year 1895 is based upon data received from about 3,000 stations occupied by regular and voluntary observers of the Weather Bureau, Canadian data received by the cooperation of Prof. R. F. Stupart, and Mexican data received from the Directors of observatories in that country. The statistical tables have been generally prepared by the Division of Records and Meteorological Data, A. J. Henry, Chief of Division. The text and editorial work is by Prof. Cleveland Abbe unless otherwise specifically noted.

GENERAL CLIMATIC CONDITIONS.

ATMOSPHERIC PRESSURE.

The mean pressure for 1895 is shown numerically in Tables I and II. The data there given refer to the mercurial barometer corrected for instrumental temperature and error but not reduced to standard gravity, and, therefore, in accordance with the strict usage of physicists should be called "mercurial barometric means;" the readings by aneroid barometers would differ therefrom by amounts depending upon the local variations of gravity at different latitudes and altitudes. In accordance with the decision of the International Meteorological Congress the term atmospheric pressure should be used only in connection with true pressure or absolute measurements of pressure, that is to say, measurements that are strictly comparable among themselves and are not distorted by any variations of temperature or gravity. The corrections to barometric readings for the effects of temperature, instrumental error, and local gravity should all be applied at the same time in order to obtain the true local pressure instead of the apparent pressure as indicated by the crude readings of mercurials and aneroids. The gravity correction is a constant for each station, its value is so large as to be appreciable in studies based on the daily maps, and is still more important in studies based on the maps of monthly and annual means. The reduction of local pressure to sea-level pressure is a separate step, the method proper for this reduction varies in different countries and under different circumstances, but there is no essential difference of opinion as to the corrections for instrumental temperature and local gravity. The method of reduction to sea level and the omission of the correction for gravity as explained by Professor Hazen in the MONTHLY WEATHER REVIEW for 1894, Vol. XXII, p. 538, have continued in use in the Weather Bureau during 1895, and the figures given in Tables I and II, as also those in Chart I accord therewith.

In order to present the distribution of the true atmospheric pressure as reduced to sea level by the tables and methods of the International Meteorological Congress, the Editor has requested Mr. Park Morrill to prepare Chart IV. The data used by him, namely, the latitude, temperature, dew-point and local pressure corrected for gravity and the methods adopted are given in full in the special contribution by him to this annual summary. The simplified methods of reduction to sea level that it is convenient to adopt in daily telegraphic work are not necessarily those that should be adopted in studying monthly and annual means, therefore the data given in Mr. Morrill's table (A) and in Chart IV of sea level pressures is especially commended to the student.

As the general motions of the lower atmosphere depend intimately upon those of that portion of the air that is within 20,000 feet of sea level the Editor has requested Mr. Morrill to prepare from the same data and by the same methods a system of isobars showing pressures and temperatures at an elevation of 10,000 feet. The resulting isotherms are found by diminishing those of Chart IV by exactly 20° F., but the high level isobars are drawn on Chart V and differ entirely from those for sea level.

These charts cover the stations of the United States and Canada. The Editor has been able to add data for only a few Mexican stations, and forbears from extending the isotherms and isobars over Mexico, but hopes to cover this region more fully at a future time.

The data on Chart I show that the reduced barometric means, not corrected for gravity, were highest in the east Gulf and South Atlantic States, and lowest in Arizona. They were also quite low in Alberta, Assiniboia, and Manitoba, and eastward to Newfoundland. The data on Chart IV show that the mean annual atmospheric pressure was also lowest and highest in these same regions, respectively, but the gradients and many other details differ appreciably from those of Chart I.

The data on Chart V show that the high-level gradients are steeper, and that therefore the currents of air must be swifter, than at sea level, and even if there be a considerable systematic alteration in the adopted temperatures of the columns of air between the upper and lower levels, yet no reasonable hypothesis will alter this conclusion. Consequently the air that descends from above to the earth's surface must have a decided influence upon our winds, as it is known to have upon our weather. It is quite as proper to compare the resultant surface winds on Chart I with these high level isobars of Chart V, as it is to compare the cloud movements with the latter. In the day time the winds at the