SYNOPTIC WEATHER MAPS Part I

HISTORICAL BACKGROUND

The modern series of historical sea-level weather maps for the Northern Hemisphere began with the 12-hour forecast based on the previous 0000 GMT data, and the analyses at the lower constant-pressure surfaces which are continued prior to the 500-millibar analyses. The use of the forecast maintains time-continuity of the major systems, and the use of the lower-level analyses parameters maintains vertical consistency. This "first-guess" field consists of point values at regular intervals on the base map.

The observations are used to adjust the gridpoint values of the "guess" field. The amount of the adjustment depends upon the distance from gridpoint-to-observation, the departure of the observed value from the "guess" value, the number of observations in the vicinity of the gridpoint, etc. The analysis is refined by several iterations through the "guess" field, so that the field is gradually brought to a satisfactory fit with the observations. The data are also used for error analysis as one of the components of the monitoring analyst decides whether to discard those data which failed the tests and inserts information to correct errors.

Later refinements were made to each machine-analyzed chart prior to publication to eliminate detectable errors in analysis, and to smooth and adjust isolines which were found to be inconsistent with the corresponding sea-level charts. Comparisons were also made with other hand-drawn 500-millibar charts, and inconsistencies resolved. These adjustments were made a sufficiently long time after the maps date to allow the use of late reports, when deemed advisable, and for close coordination with the sea-level charts which, themselves, were analyzed after receipt of the greatest possible number of reports.

Height contours were drawn as solid lines at intervals of 200 feet from the beginning of the series through June 1957, at intervals of 50 meters from July 1957 through December 1965, and at intervals of 200 feet from January 1966 on. Isotherms at 5°C intervals were drawn as single dashed lines.