THE WEATHER AND CIRCULATION OF FEBRUARY 1955[1]

ANOTHER FEBRUARY WITH TWO CONTRASTING REGIMES

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1. THE TWO REGIMES

In four out of five years since this series of monthly articles was started in 1950, it was convenient to discuss the weather and circulation of the first half of February separately from that of the second half [1, 2, 3, 4]. A similar situation prevailed again this February. Figures 1 and 2 show that the mean circulation at 700 mb. was quite different during the two halves of the month, particularly over North America and adjacent oceans. The first half of February 1955 was similar in many ways to the preceding January [5], with a belt of fast westerlies at middle latitudes (fig. 1A), a strong blocking High near Greenland, and an abnormally long half wavelength in the northern United States between a strong ridge along the west coast and a deep trough in the Atlantic (fig. 2A). This pattern produced northwesterly flow and below normal temperatures in much of the country during the first and second weeks of the month (fig. 3A and B).

[1] See Charts I–XV following p. 51 for analyzed climatological data for the month.

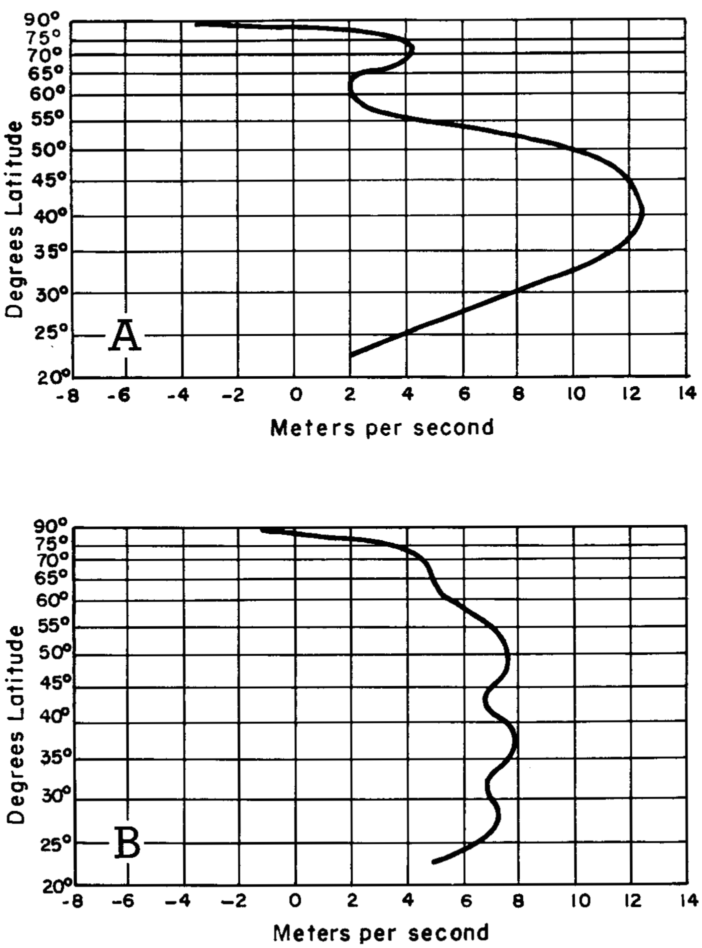

FIGURE 1.—Mean 700-mb. zonal wind speed profiles in the Western Hemisphere for (A) February 1–14, and (B) February 15–28, 1955. Pronounced west wind maximum at 40° N. during first half of month became weak and ill defined during second half of month.

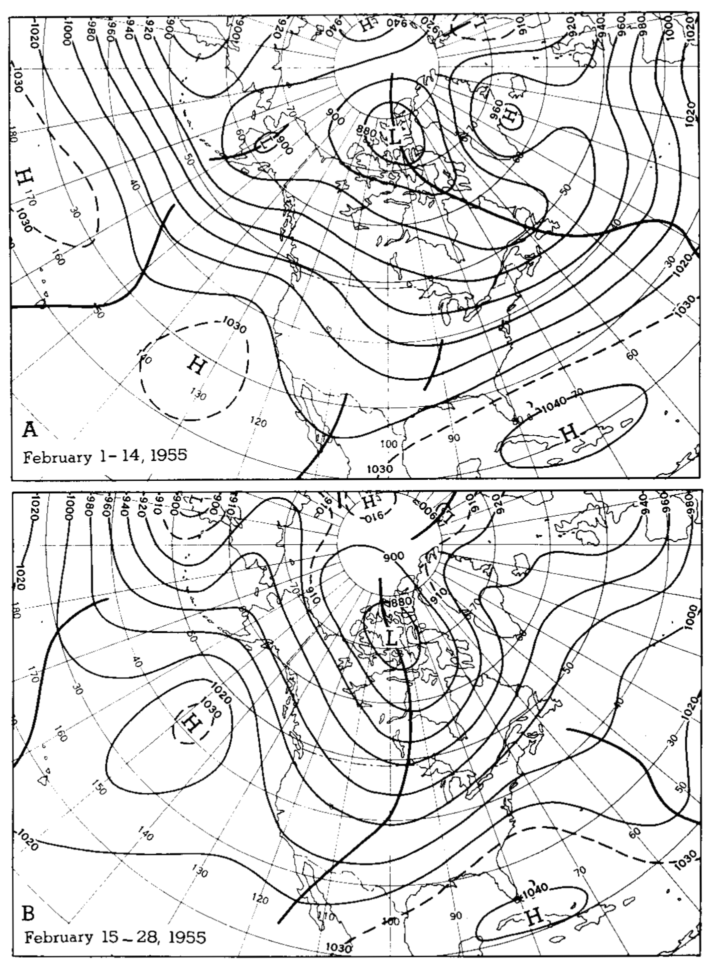

FIGURE 2.—Mean 700-mb. contours (tens of feet) for (A) February 1–14, and (B) February 15–28, 1955. Many features of the pattern retrograded from the first to the second half of the month as amplitudes generally increased and zonal wind speeds decreased.

During the second half of February the mean zonal flow became very weak and ill-defined, and its maximum speed was reduced from 13 to 8 meters per second (fig. 1, compare A and B). This was accompanied by a readjustment of the general circulation at middle latitudes, where wavelengths generally became shorter and amplitudes larger. The trough element which had started to develop in the Mississippi Valley during the first half of the month (fig. 2A) joined with troughs over Lower California and northern Canada to form a single full-latitude trough which dominated the entire North American circulation during the second half of February (fig. 2B). At the same time, the amplitude of adjoining ridges increased greatly, particularly in the eastern Pacific. Between the Pacific ridge and the North American trough strong northerly flow produced below normal temperatures in the western half of the United States (fig. 3C and D). The last week of February was the coldest week of the winter in the Northern Plains, where temperatures averaged 15° to 18° below normal over a wide area which had averaged above normal all winter long [5]. In the eastern half of the United States, on the other hand, strong southwesterly flow ahead of the newly developed trough resulted in the warmest weather of the winter during the last two weeks of February, with extreme departures of +12° in northern New England (fig. 3D). In the Atlantic the closed blocking High which had been over Greenland merged with the subtropical ridge, while the deep trough in mid-ocean sheared off from its Canadian affiliate and filled considerably at middle latitudes.

The contrast between the circulation patterns of the first and second halves of the month is highlighted in figure 4, which shows the departure from the February normal of the mean 700-mb. heights given in figure 2. During the first half of the month the largest hemispheric anomaly, +610 ft., was found in the blocking High over Greenland. In the United States heights averaged somewhat above normal, but departures were generally small and anomaly gradients weak.

The largest 700-mb. height anomaly in the Northern Hemisphere during the second half of February was found in the northeastern Pacific, with extreme departure of +740 ft. centered at 50° N., 154° W. (fig. 4B), northwest of the High center at 700 mb. (fig. 2B). In this area mean heights rose over 600 ft. from the first to the second half of the month. Large positive anomalies in this portion of the Pacific are frequently accompanied by above normal heights in the eastern United States. For example, a correlation of +0.57 has been noted between simultaneous anomalies of wintertime monthly mean 700-mb.

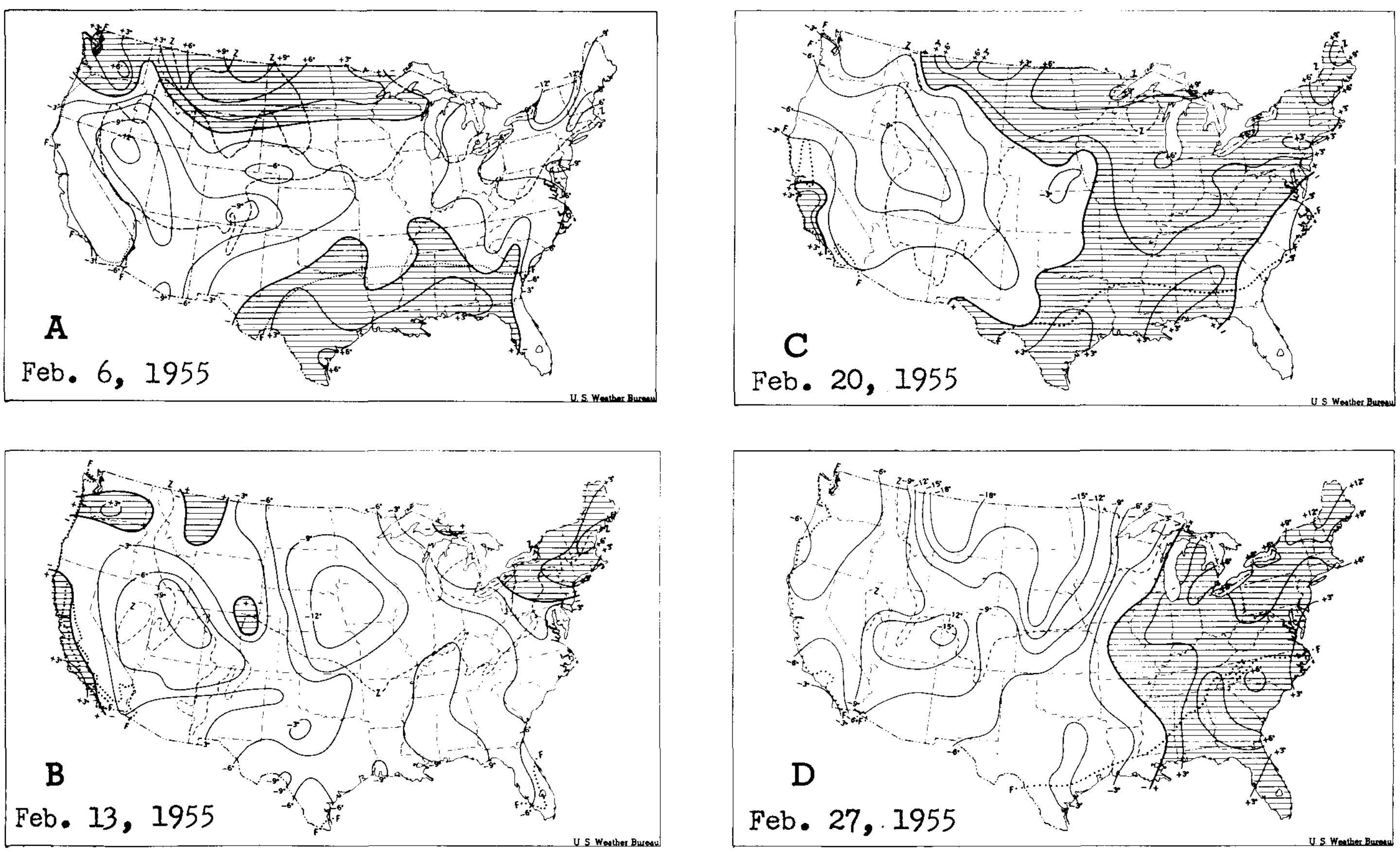

Figure 3.—Departure of average temperature from normal (° F.) for the weeks ending at midnight, local time, on the dates shown. Shading indicates temperatures of normal or above; dotted line shows southern limit of freezing temperatures; dashed line southern limit of zero degrees. Note trend toward warming in East and cooling in Northern Plains. (From *Weekly Weather and Crop Bulletin, National Summary*, vol. 42, Nos. 6, 7, 8, and 9.)

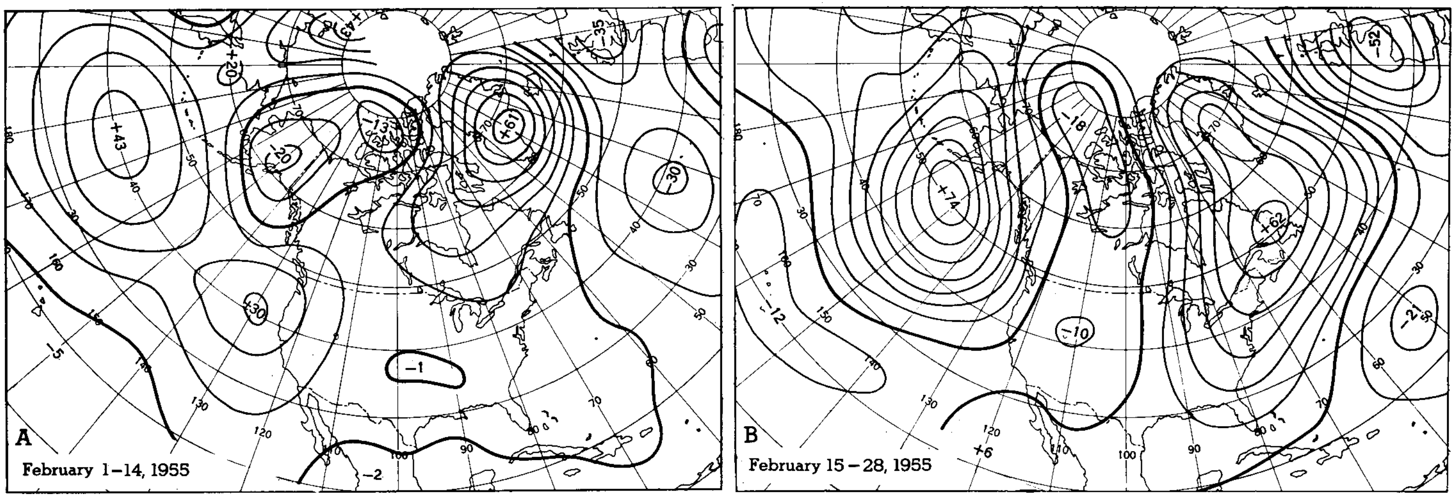

Figure 4.—Departure from normal of mean 700-mb. heights shown in figure 2. Isopleths are drawn for intervals of 100 ft. with zero line heavier and anomaly centers labeled in tens of feet. First half of month was dominated by strong positive anomaly of blocking type over Greenland. Development of strong positive anomaly in northeastern Pacific during second half of month was accompanied by marked falls in height in western half of United States and rises in eastern half.

height at 40° N., 150° W., and 35° N., 75° W. [6]. Even more striking is the marked similarity in pattern between the lines of equal height anomaly in figure 4B and the lines of equal percentage frequency in figure 5, taken from an extensive study of circulation teleconnections by Martin [7]. This figure shows how often 5-day mean 700-mb. heights during the winter months were above or below normal when any axis of maximum anomaly was located at 50° N. between 150° and 160° W., the very area with largest positive height departure in figure 4B. Positive anomalies in this area were accompanied by negative height anomalies in the Great Basin on 90 percent of 5-day mean maps during past winters, while heights were above normal along the east coast 70 percent of the time during the same period. It is not surprising, therefore, that during the second half of February 700-mb. heights increased markedly to well above normal levels throughout the eastern half of the United States, but fell sharply to below normal values in the western half of the country. From this point of view the circulation anomalies observed over North America during the second half of February may be considered to be a resonance effect of corresponding anomalies in the Pacific.

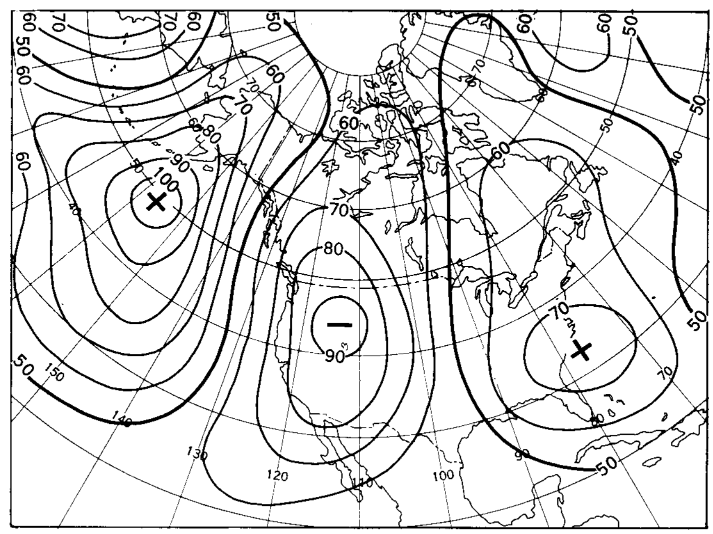

Figure 5.—Percentage frequency of sign of 5-day mean 700-mb. height anomaly for all wintertime cases from 1946 to 1952 when an axis of maximum anomaly at 50° N. lay within the area from 150° to 160° W. (from [7]). Isopleths are drawn at intervals of 10 percent with 50 percent line heavier. Note striking similarity to figure 4B.

2. THE INDEX CYCLE

The non-homogeneous nature of February circulation during five of the past six years may be related to the fact that the primary index cycle of the year usually occurs in that month [6]. The index cycle is a period of several weeks during which the strength of the zonal westerlies at middle latitudes gradually declines from comparatively high to low values and then recovers. A particularly pronounced cycle of this sort was associated by Winston with a large-scale change in circulation during February 1952 [3]. An equally pronounced index cycle accompanied this February's change in weather regime.

Figure 6 depicts the time variation of 5-day mean values of the 700-mb. zonal index computed twice weekly from average heights at latitudes 35° and 55° N. in the Western Hemisphere from mid-November 1954 to mid-March 1955. The index cycle may be considered to begin at the high point of the graph, denoted by the arrow, a value of 13.8 m./sec. observed during the 5-day period centered January 31, 1955. This was 2.8 m./sec. above normal and the highest value observed during any 5-day period since December 11, 1953. For the next 3 weeks the index declined irregularly, reaching values 4 m./sec. below normal in the periods centered February 18 and 21. The minimum of 5.9 m./sec. on the 18th was the lowest index

TABLE 1.—*Monthly mean values of the 700-mb. zonal index (35°–55° N.) in the Western Hemisphere (all units in meters per second)*

Month	Observed index	Normal	Anomaly
December 1954	10.5	11.3	−0.8
January 1955	10.5	11.8	−1.3
February 1955	9.2	10.2	−1.0

observed during any 5-day mean period since July 1954 and the lowest in any winter period since February 1952. Thereafter the index rose in irregular fashion to above normal values during the second week of March, and the index cycle was terminated.

In its overall aspects this year's index cycle was quite typical of the type described by Namias [6]. However, it was somewhat unusual in three respects. In the first place the low point of the cycle, on February 18, was reached about two weeks earlier than the average date of occurrence. Secondly, the falling index stage of the cycle was not accompanied by expansion of the circumpolar vortex in the classical fashion; in fact, the subtropical (20°–35° N.) westerlies were weaker than normal and the polar (55°–70° N.) westerlies stronger than normal at 700 mb. during most of February. Finally, this year's index cycle was preceded by two minor cycles with low points reached on December 20 and January 7 (fig. 6). Although neither of those cycles was as prolonged or intense as the primary cycle of February, they were sufficient to produce below normal monthly mean values of the zonal index at 700 mb. during both December and January (table 1). Since the February value was also below normal, this winter was the first in our records (starting 1943) to have below normal values of the 700-mb. zonal index during all three months of the season.

3. THE 5-DAY MEAN ANOMALY CENTERS

Both the index cycle and the reversal in circulation during February 1955 can be clarified on the basis of figure 7. This figure gives the paths of the two most prominent centers of positive height anomaly during the month, as obtained from a series of partly overlapping 5-day mean 700-mb. height departure from normal charts prepared twice weekly. The center of each anomaly during each 5-day mean period is plotted as an open circle with the middle day of the period in large numbers above and the central intensity in tens of feet in small numbers below. Both the continuity of these centers from map to map and their resultant trajectories were clear and well-defined during February. This was not true, however, during the adjacent months of January, when the centers formed, or March, when they dissipated.

The zonal index, which measures the strength of the westerlies between latitudes 35° and 55° N. in the longitudes from 0° westward to 180°, was mostly above normal during the first week of February (fig. 6) in part because the two positive anomaly centers of figure 7 were out of the index band, with the Atlantic anomaly being north of

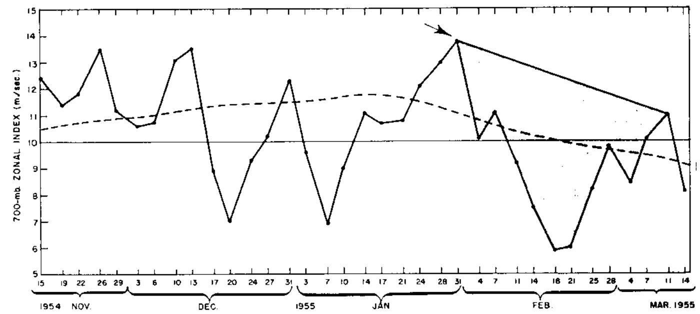

FIGURE 6.—Average strength of 700-mb. westerlies between latitudes 35° and 55° N. over the Western Hemisphere. Solid line connects observed 5-day mean index values (plotted at middle of 5-day period and computed twice weekly), while dashed line shows variation of normal index. Shaded area denotes primary index cycle beginning with the high index period indicated by arrow.

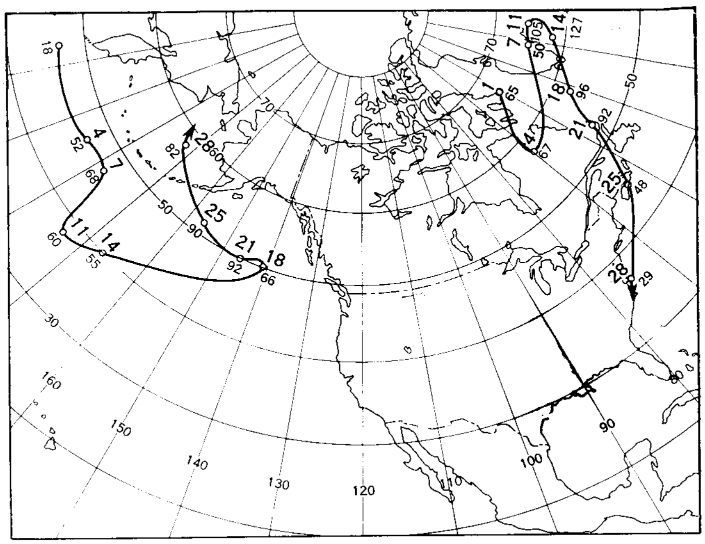

FIGURE 7.—Trajectories of two outstanding centers of positive 700-mb. height anomaly during February 1955. Open circles locate the center of each anomaly on a series of 5-day mean charts computed twice weekly. The large upper number is the middle date of the 5-day period, and small lower number is the intensity of the center in tens of feet. The Atlantic center was more intense than the Pacific center during the first 2½ weeks of the month but less intense during the last week.

55° N. and the Pacific anomaly west of 180°. The index dropped sharply during the next two weeks as the center of positive anomaly in the Pacific advanced eastward into the Western Hemisphere and northward to 50° N. This decline of the index was aided by marked intensification of the anomaly center in the Atlantic, which reached a maximum intensity of 1270 ft. above normal in the Denmark Strait during the 5-day period centered February 14. Falling index was also associated with the slow southward motion of this anomaly to 55° N., near which latitude it was centered during the periods of index minimum on the 18th and 21st. Rapid increase of the index during the last week of the month was accompanied by marked southward displacement of the Atlantic anomaly center,

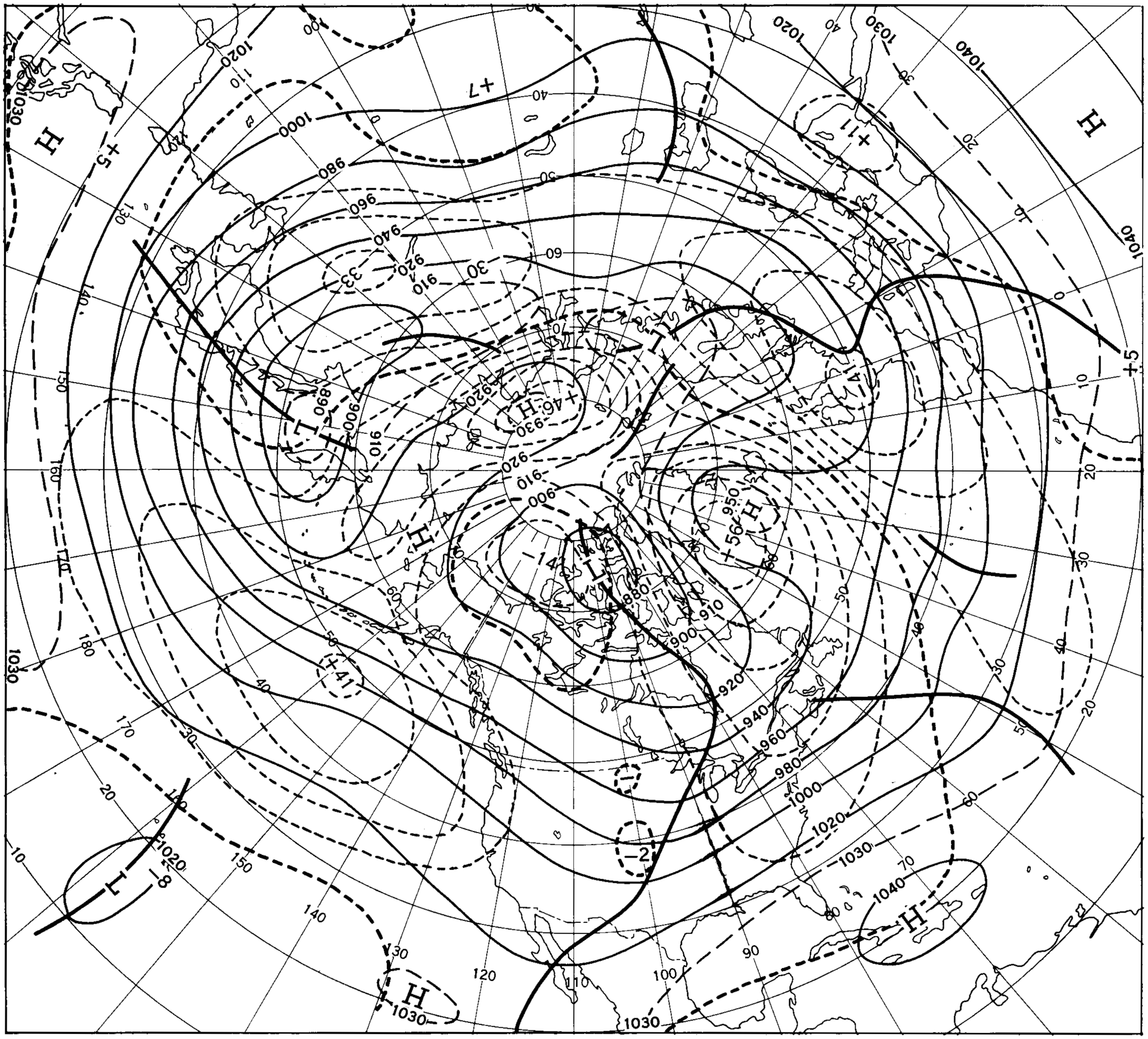

FIGURE 8.—Mean 700-mb. contours and height departures from normal (both in tens of feet) for January 28–February 27, 1955. Outstanding features of hemispheric circulation are blocking Highs over Greenland and Russian Arctic, deep trough in Europe, strong ridge in eastern Pacific, and below normal heights in eastern Asia.

and by motion of the Pacific anomaly center to the northwestern border of our index band.

The 700-mb. circulation during the first half of February (figs. 2A and 4A) reflects the dominant role of the strong positive anomaly which was centered in the vicinity of southern Greenland on every 5-day mean map during the period (fig. 7). At the same time the positive anomaly in mid-Pacific was considerably weaker than the one in the Atlantic. During the third week of the month a transition took place. The Pacific center intensified and entered the critical area south of the Gulf of Alaska where positive height anomalies frequently go with above normal heights on the east coast of the United States, as previously pointed out (see p. 39 and fig. 5). Perhaps in response to this stimulus, the Atlantic anomaly center began to migrate southwestward, from the vicinity of Greenland to Newfoundland and Nova Scotia. By the end of the month this center was located along the Middle Atlantic Coast of the United States, where it was in harmony with large positive departures in the northeastern Pacific. It is interesting to note the marked and steady decrease in central intensity of the Atlantic anomaly as it moved southward, from +1270 ft. on the 14th at 62° N. to +290 ft. on the 28th at 36° N. A similar dependence of intensity upon latitude has been noted by James [8] for daily systems at sea level and by Clapp [9] for 5-day mean 700-mb. height anomaly centers.

4. MONTHLY MEAN CIRCULATION AND WEATHER

The average 700-mb. circulation for the month as a whole reflected the extreme anomalies of the first half of the month (figs. 2A and 4A) in the Atlantic, which was dominated by a strong blocking High over Greenland and below normal heights in the Azores region (fig. 8). In the Pacific and North America on the other hand, the monthly mean map more closely resembled the charts for the second half of the month, when anomalies were largest in these regions, since it was characterized by a stronger-than-normal ridge in the eastern Pacific and a full-latitude trough through the central part of North America. Other noteworthy features of the mean February circulation were a much deeper than normal trough in Europe and below normal heights throughout eastern Asia, south of a blocking ridge in the Arctic.

The monthly mean circulation at the 200-mb. level (fig. 9) closely resembled that at 700 mb. (fig. 8). However the trough over the Japanese Islands and the ridge along the east coast of Alaska at 700 mb. were both displaced westward at 200 mb. In addition, two weak troughs in the Atlantic at low and middle latitudes and the closed High over Greenland at 700 mb. were smoothed out of the 200-mb. picture. The outstanding feature of the isotach analysis at 200 mb. (dashed lines in fig. 9) was the maximum wind speed center over southern Japan, where geostrophic speeds averaged over 70 m./sec. during the month. Another notable feature was the split jet stream in the Atlantic and adjoining continents due to the block over southern Greenland.

The departure of average temperature from normal for the month as a whole (Chart I-B) did not exceed ±2° F in most of the eastern half of the United States, where early-period coldness was balanced by abnormal warmth at the end of the month. Nevertheless, monthly mean temperatures generally averaged slightly above normal east of the Mississippi River as a result of the prevalence of southerly and easterly winds, relative to normal, on the monthly mean charts at both sea level (Chart XI inset) and 700 mb. (fig. 8). In the western half of the country, on the other hand, stronger than normal northerly flow at all levels was accompanied by below normal temperatures during both the first and second halves of the month. Negative temperature anomalies for the month as a whole exceeded 10° F. in part of the Great Basin. Cold weather in this area is a frequent concomitant of a strong high cell in the eastern Pacific, where February pressures averaged as much as 16 mb. above normal at sea level (Chart XI inset).

This month's pattern of temperature anomaly in the United States, cold in the west and warm in the east, is usually accompanied by abundant precipitation and cyclonic activity. It is not surprising, therefore, that precipitation during February was generally above normal in most of the United States east of the Continental Divide (Chart III). This heavy precipitation was associated with the presence of a mean trough in the central United States

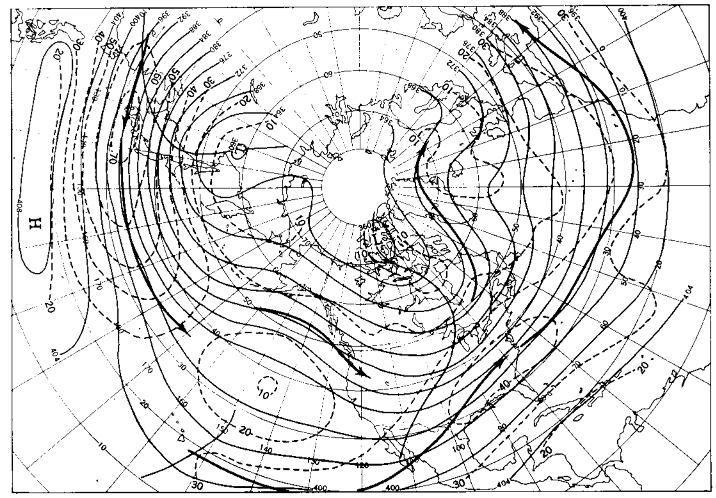

FIGURE 9.—Mean 200-mb. contours (in hundreds of feet) and isotachs (dashed, in meters per second) for January 29–February 27, 1955. Solid arrows indicate the position of the mean 200-mb. jet stream, which was strong and single in the western Pacific but weaker and split in other portions of the map.

at all levels of the troposphere (Charts XI to XV and fig. 9). Stronger than normal southerly flow at sea level and southwesterly flow at 700 mb. ahead of this mean trough transported considerable moisture from the Gulf of Mexico into the eastern half of the country. This moisture was released during widespread cyclonic activity (Chart X) north of the principal jet stream at 200 mb. (fig. 9). During one of these storms, on February 5, New Orleans reported 1 inch of rain in 5 minutes, a new 60-year record for the station. Cyclones were especially frequent in the Central Plains, Ohio Valley, and New England, portions of which had twice the normal amount of precipitation. Much of this fell as snow in northern New England, where Ft. Kent, Maine, reported as much as 58 inches on the ground on February 20. The State with the greatest excess of precipitation in the United States was Kentucky, where Statewide amounts averaged 208 percent of normal.

Moisture from the Pacific and the passage of an unusually large number of cyclones were responsible for heavy snows in the northern half of the Great Plains. More than twice the normal precipitation fell in large parts of Nebraska, South Dakota, Wyoming, and Montana. Upslope action produced by some easterly wind components, relative to normal, at both sea level and 700 mb. was also instrumental in this precipitation. The worst storm of the winter occurred on February 19 when a true blizzard, accompanied by winds up to 70 m. p. h. and temperatures near zero, left up to 14 inches of snow in parts of South Dakota.

In the Southeast, Southern Plains, and Upper Lakes region precipitation amounts were generally subnormal and in some cases less than one-half of normal. In each of these areas the monthly mean vorticity at 700 mb. was more anticyclonic than normal (fig. 10). A fairly good relation between precipitation and relative vorticity at the 700-mb. level on daily charts in the southeastern United

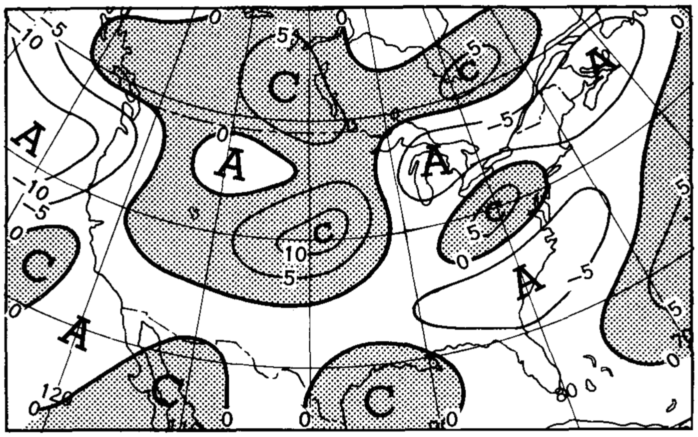

FIGURE 10.—Departure from normal of vertical component of mean geostrophic relative vorticity at 700 mb. for January 29–February 27, 1955, in units of $10^{-6}sec^{-1}$. Areas with greater cyclonic vorticity than normal (shaded and labelled C at center) correspond fairly well with areas of above normal precipitation for month (Chart III). Areas with greater anticyclonic vorticity than normal (labelled A at center) correspond to areas of below normal precipitation.

States was found by Slater [10]. The rain shadow effect contributed to light precipitation in New Mexico, southeast Colorado, southwest Kansas, western Oklahoma, and western Texas, where anomalous mean 700-mb. wind components were northwesterly. In this area of drought less than half the normal precipitation has fallen during the last 7 months.

West of the Continental Divide precipitation was generally subnormal and, in many areas, less than half of normal. Light amounts in this sector were associated with the dominance of dry northerly flow on all but the last few days of the month at all levels from sea level (Chart XI) to 200 mb. (fig. 9). Furthermore, high pressure prevailed at sea level, and mean vorticity at 700 mb. was generally more anticyclonic than normal (fig. 10). The scarcity of cyclones at sea level in the Far West during the month is also noteworthy (Chart X). The driest State in the Nation during February on an absolute basis was New Mexico, with a Statewide average of only 0.35 inch total precipitation. The driest State on a relative basis was Arizona, where Statewide precipitation averaged only 34 percent of normal, and one of the worst duststorms in many years was experienced on the 18th.

One of the highlights of the month's weather on a hemispheric basis was unusual storminess in the Hawaiian Islands, where two Kona Lows, thunderstorms, floods, and strong winds were outstanding features. Total rainfall for the month was above normal on all of the islands except Kauai. The capital city of Honolulu, on Oahu, had more than five times the February normal rainfall, while many stations on the islands of Hawaii and Maui had twice as much rain as normal. The monthly mean circulation responsible for this storminess exhibited an interesting variation with elevation. At sea level (Chart XI) only a weak easterly wave was present. At 700 mb. a closed Low was centered over the Islands, south of the main westerly belt (fig. 8). At 200 mb. an open wave in the westerlies was accompanied by a strong jet stream (fig. 9). Northeast of the Islands, however, a strong ridge prevailed at all levels. As a result, anomalous wind components were easterly in much of the eastern Pacific, a condition well known to be conducive to heavy rain in the Hawaiian Islands. In particular the monthly mean 700-mb. chart was remarkably similar to that found by Stidd [11] to be concomitant with heavy rain on Oahu, since a strong center of positive anomaly was present just south of the Gulf of Alaska at the same time that heights were below normal over the Islands themselves.

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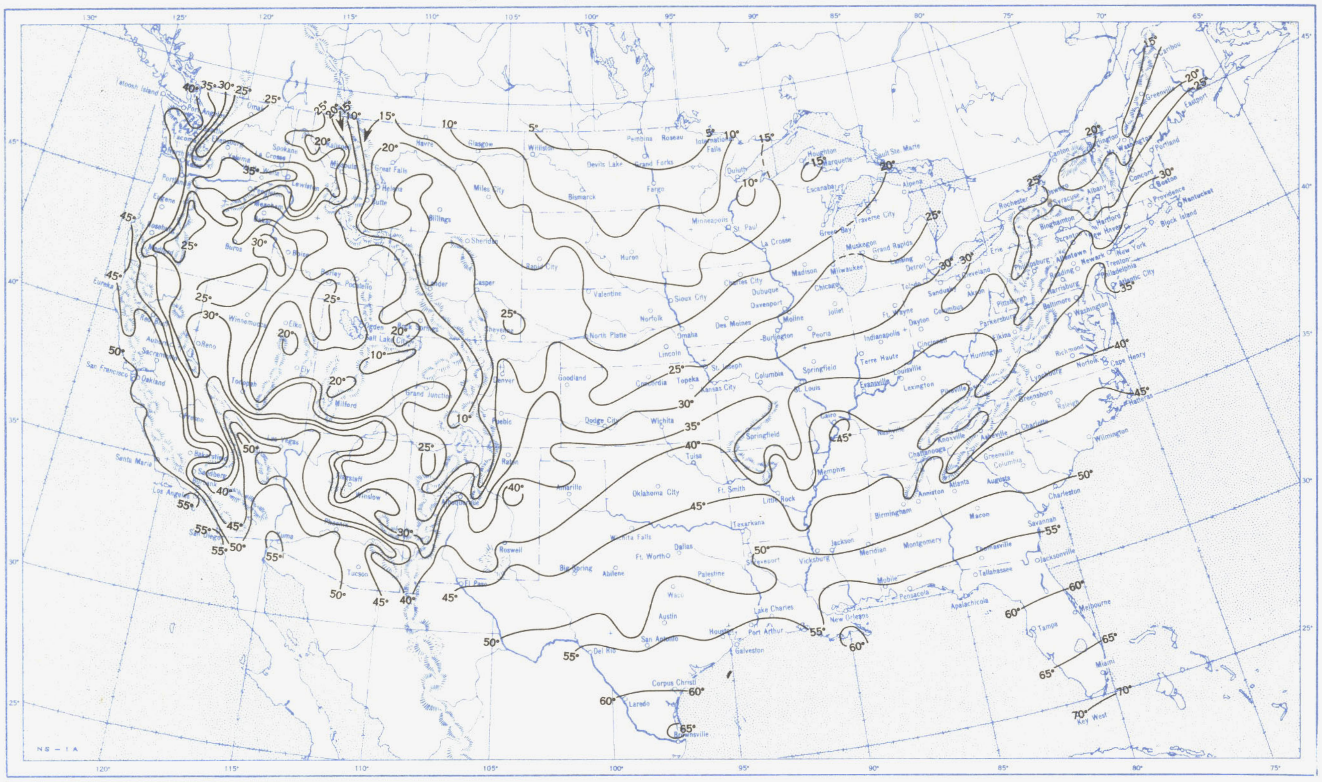
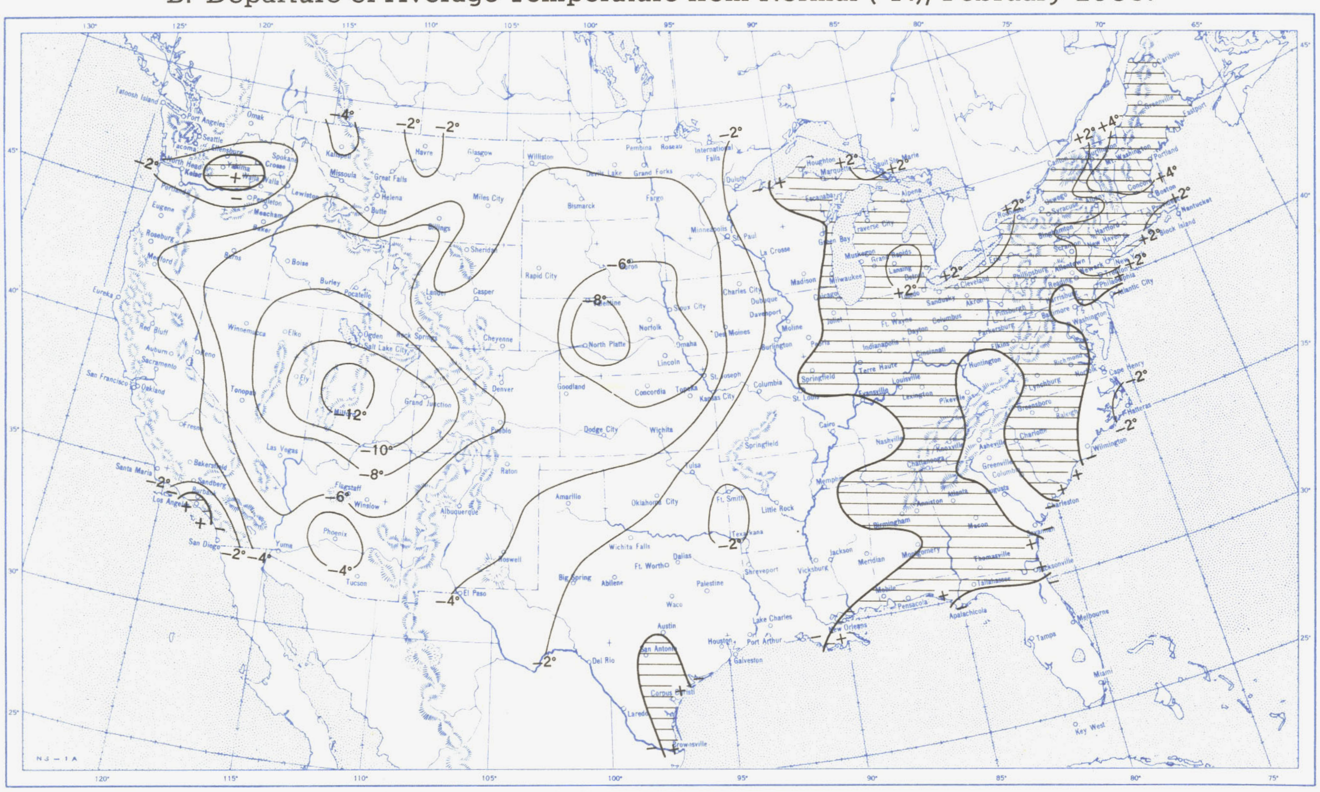
Chart I. A. Average Temperature (°F.) at Surface, February 1955.

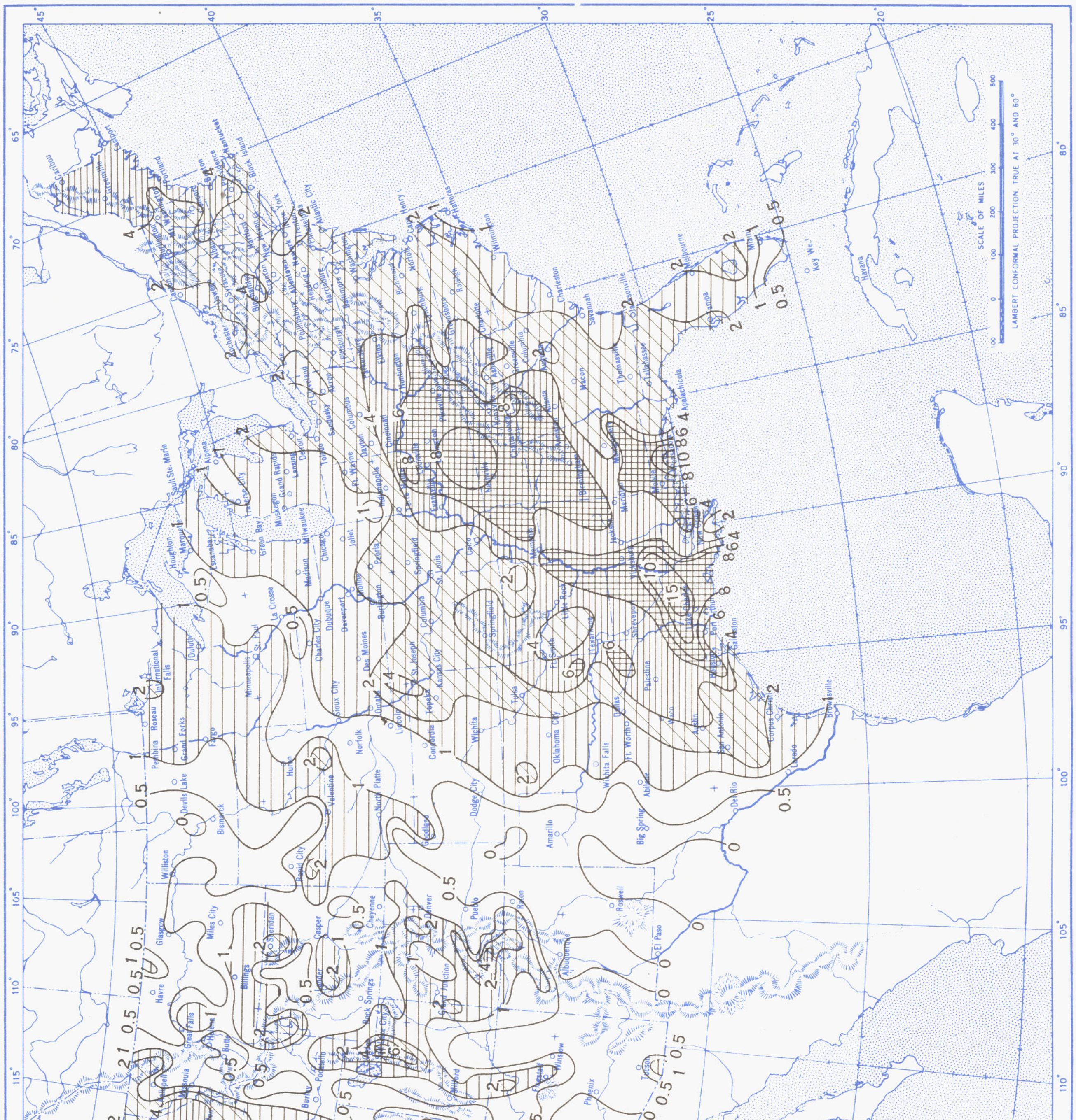


B. Departure of Average Temperature from Normal (°F.), February 1955.



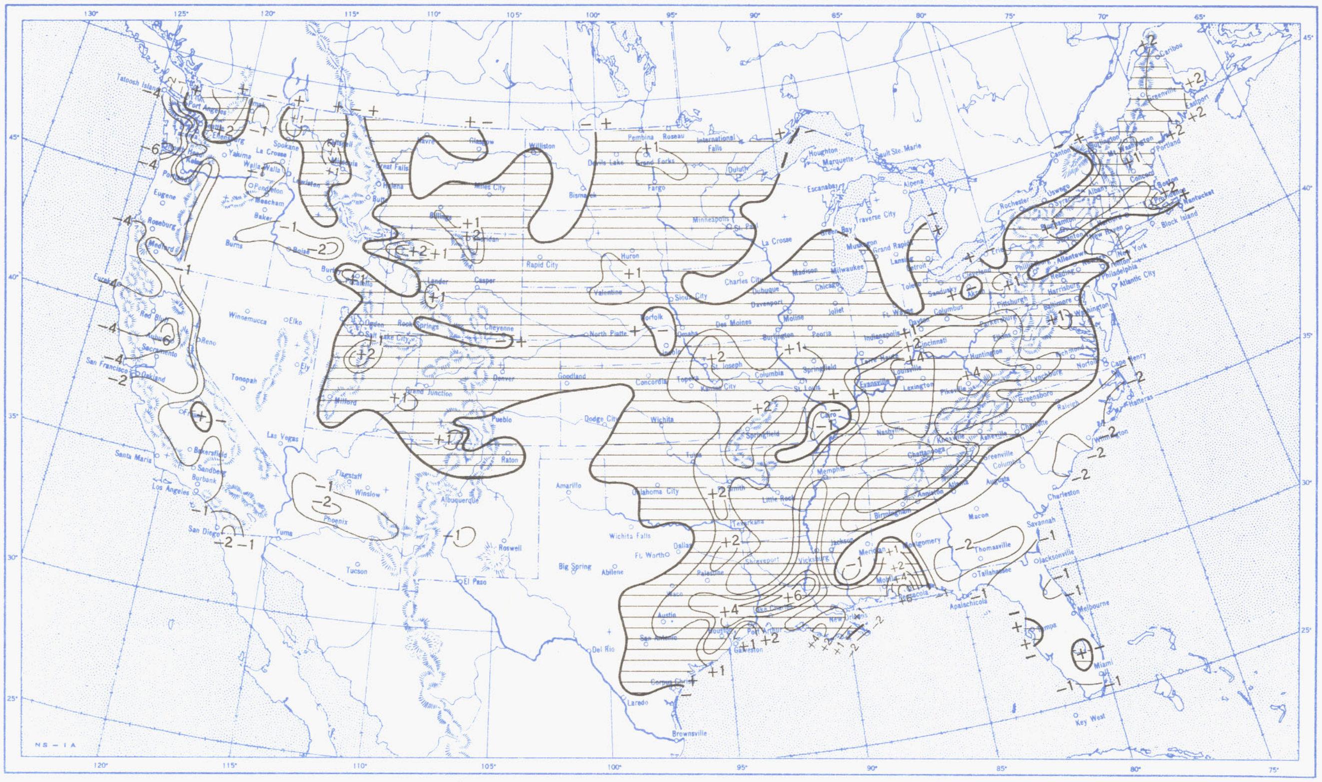
A. Based on reports from 800 Weather Bureau and cooperative stations. The monthly average is half the sum of the monthly average maximum and monthly average minimum, which are the average of the daily maxima and daily minima, respectively.
B. Normal average monthly temperatures are computed for Weather Bureau stations having at least 10 years of record.

Chart II. Total Precipitation (Inches), February 1955.

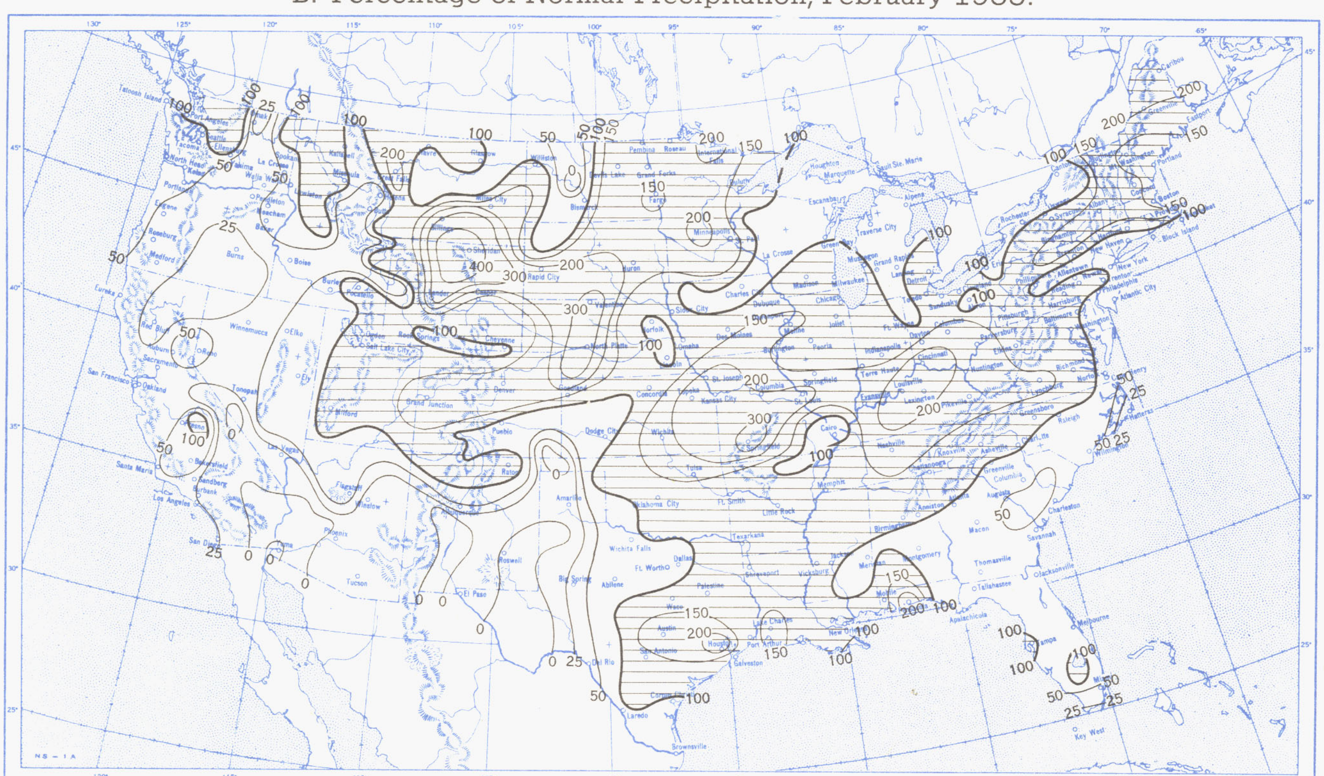


Based on daily precipitation records at 800 Weather Bureau and cooperative stations.

Chart III. A. Departure of Precipitation from Normal (Inches), February 1955.

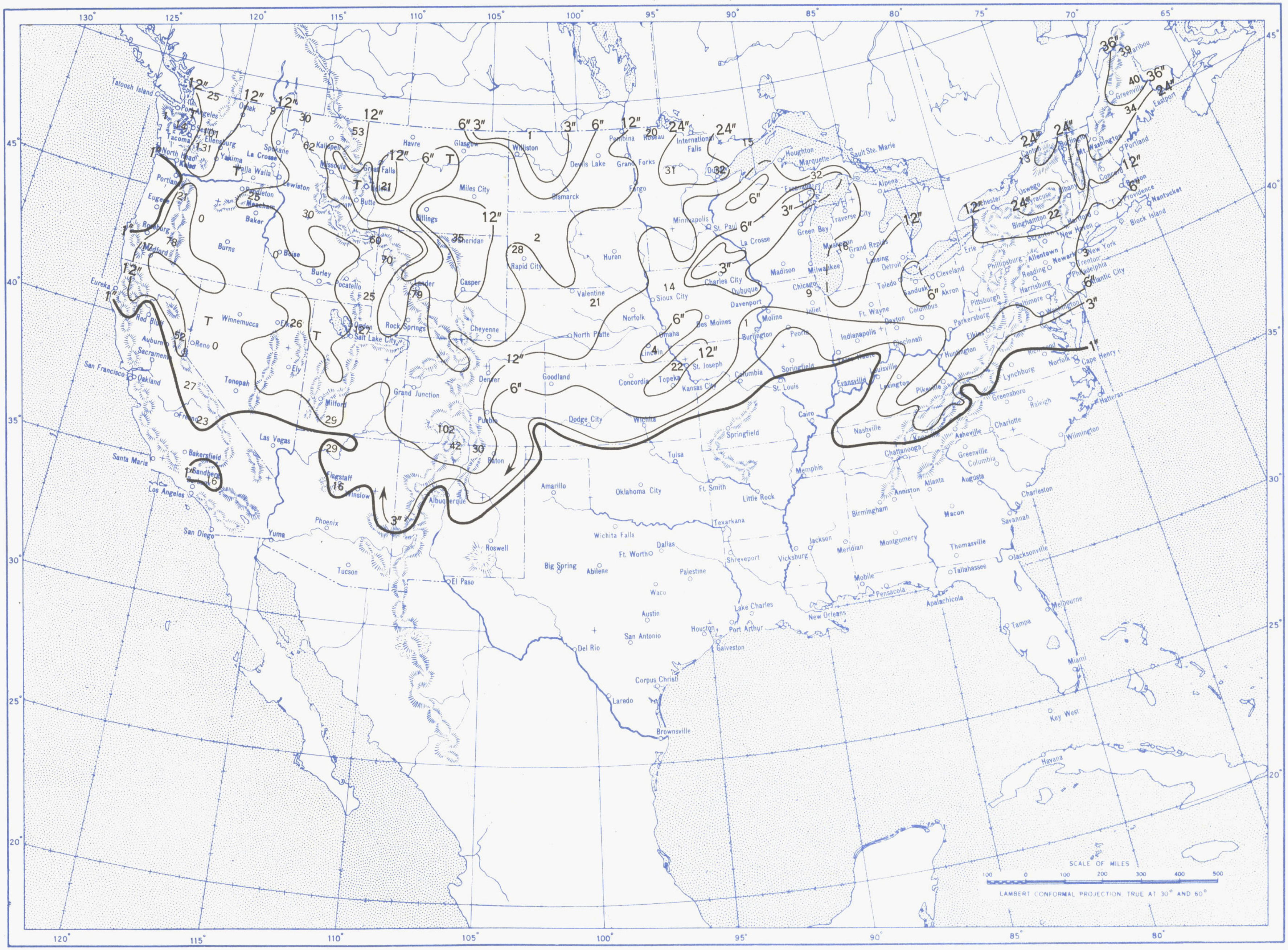


B. Percentage of Normal Precipitation, February 1955.



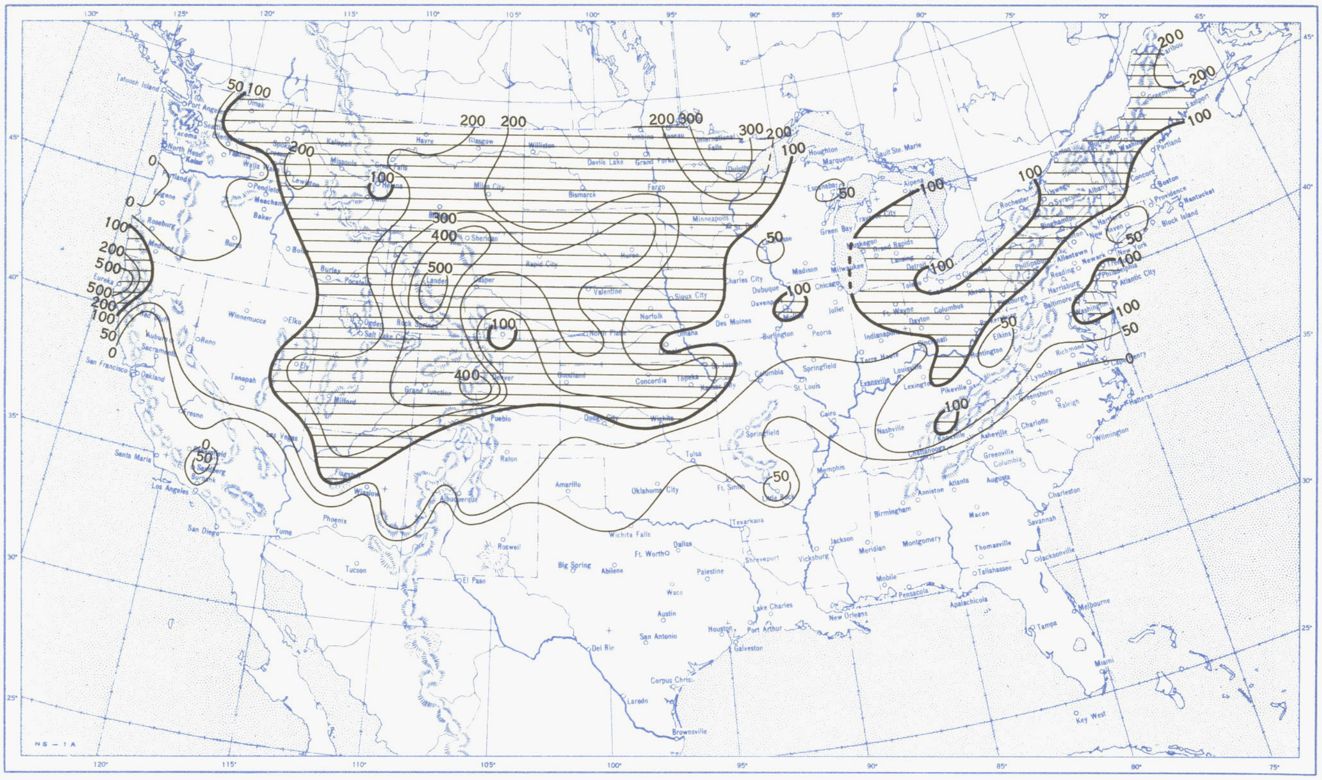
Normal monthly precipitation amounts are computed for stations having at least 10 years of record.

Chart IV. Total Snowfall (Inches), February 1955.

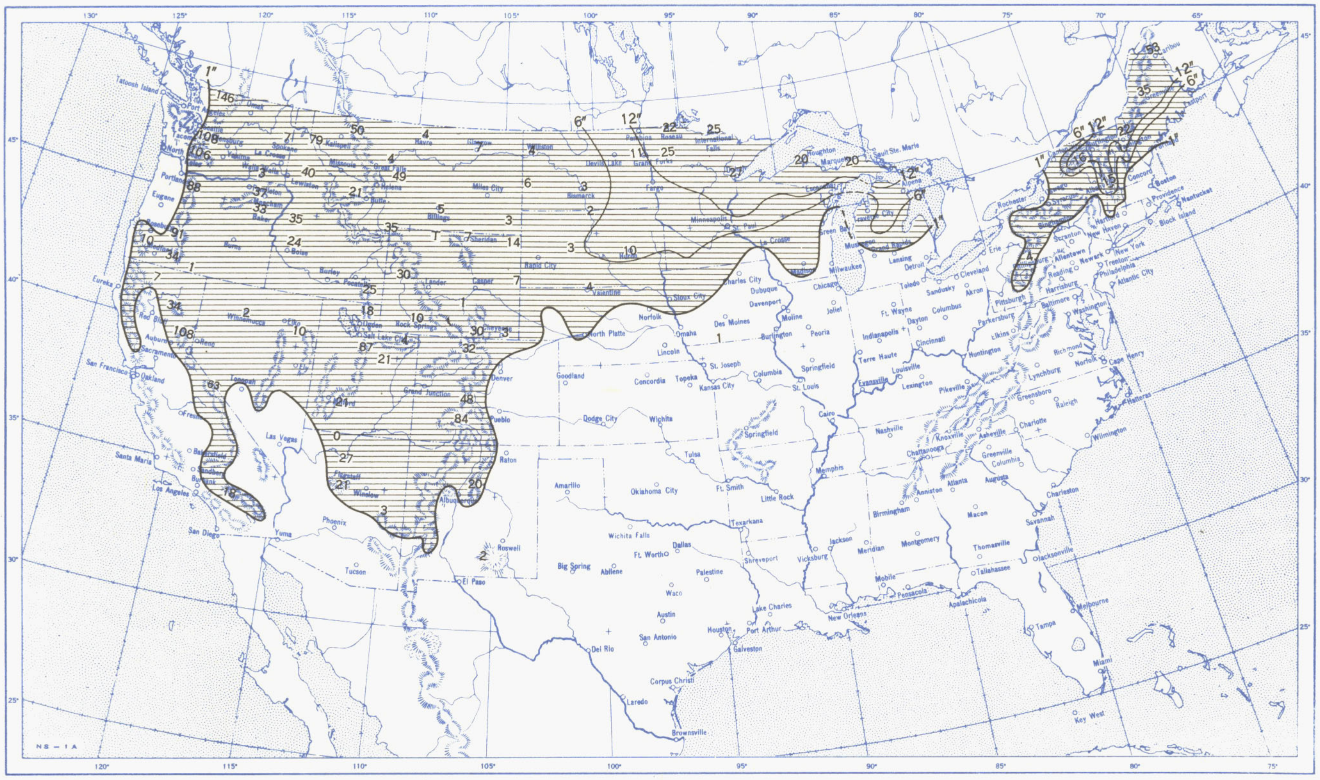


This is the total of unmelted snowfall recorded during the month at Weather Bureau and cooperative stations. This chart and Chart V are published only for the months of November through April although of course there is some snow at higher elevations, particularly in the far West, earlier and later in the year.

Chart V. A. Percentage of Normal Snowfall, February 1955.

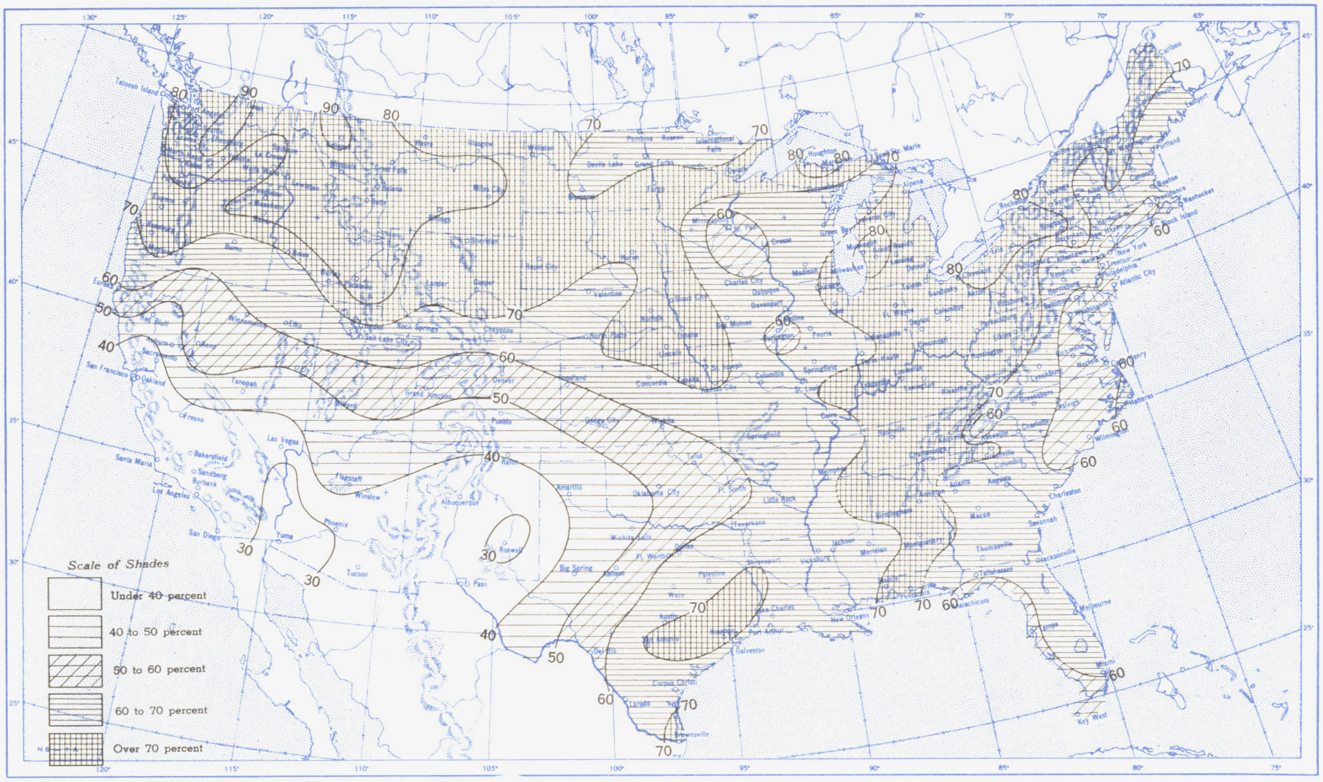


B. Depth of Snow on Ground (Inches). 7:30 a. m. E. S. T., February 28, 1955.

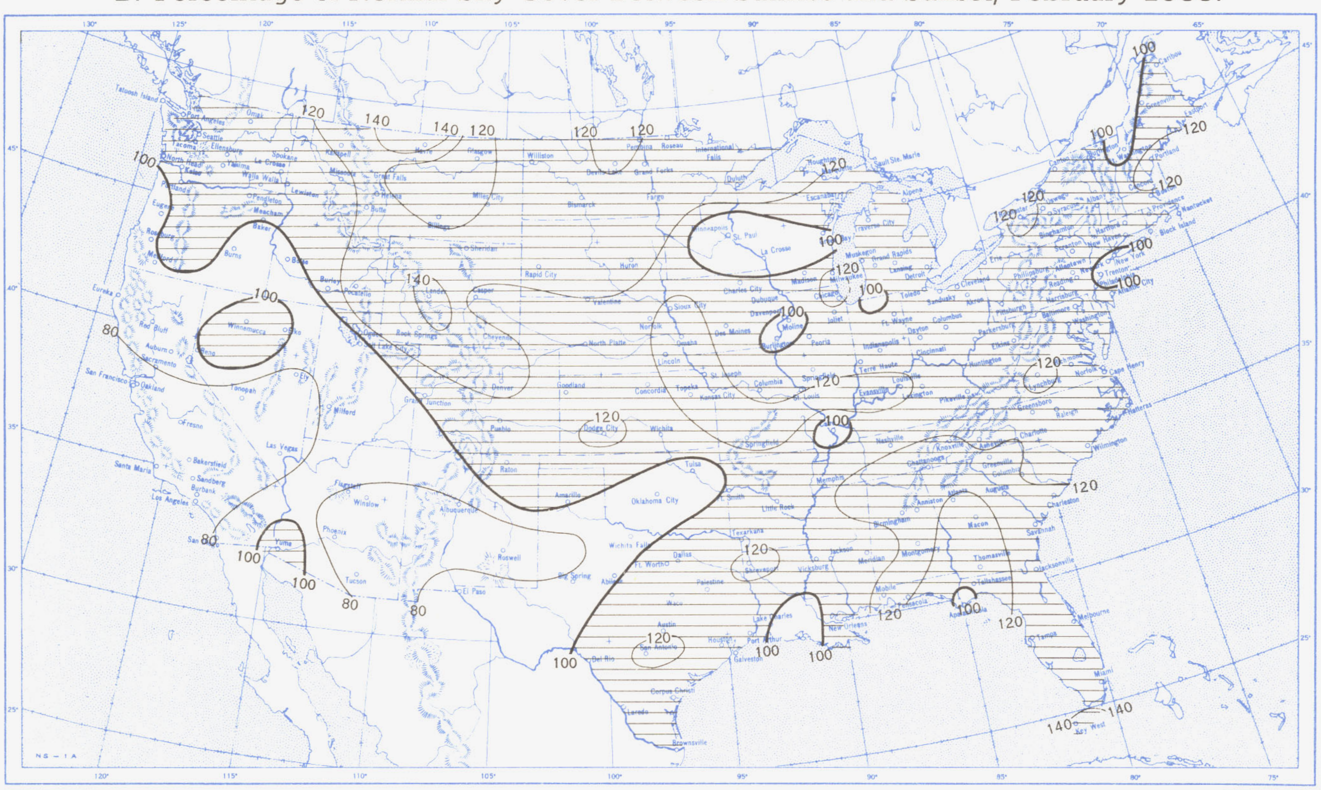


A. Amount of normal monthly snowfall is computed for Weather Bureau stations having at least 10 years of record.
B. Shows depth currently on ground at 7:30 a. m. E. S. T., of the Tuesday nearest the end of the month. It is based on reports from Weather Bureau and cooperative stations. Dashed line shows greatest southern extent of snowcover during month.

Chart VI. A. Percentage of Sky Cover Between Sunrise and Sunset, February 1955.

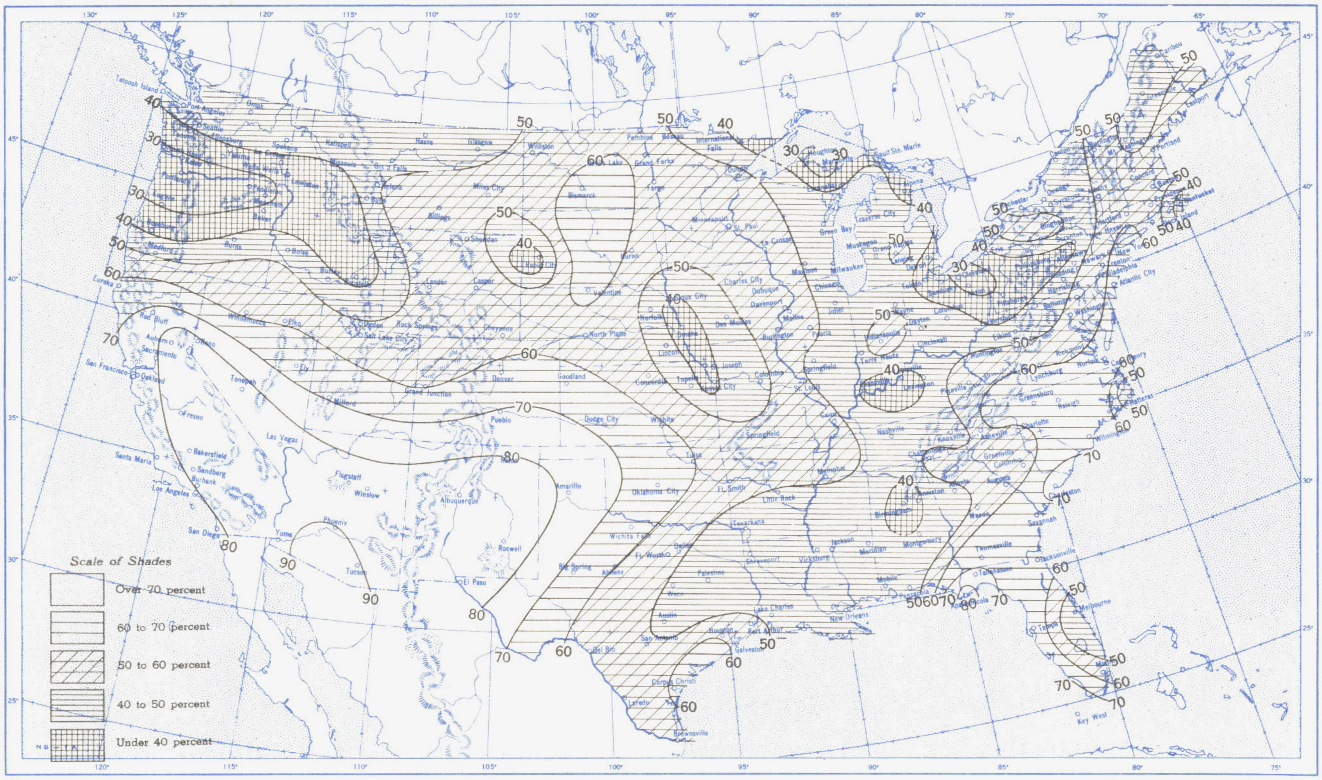


B. Percentage of Normal Sky Cover Between Sunrise and Sunset, February 1955.

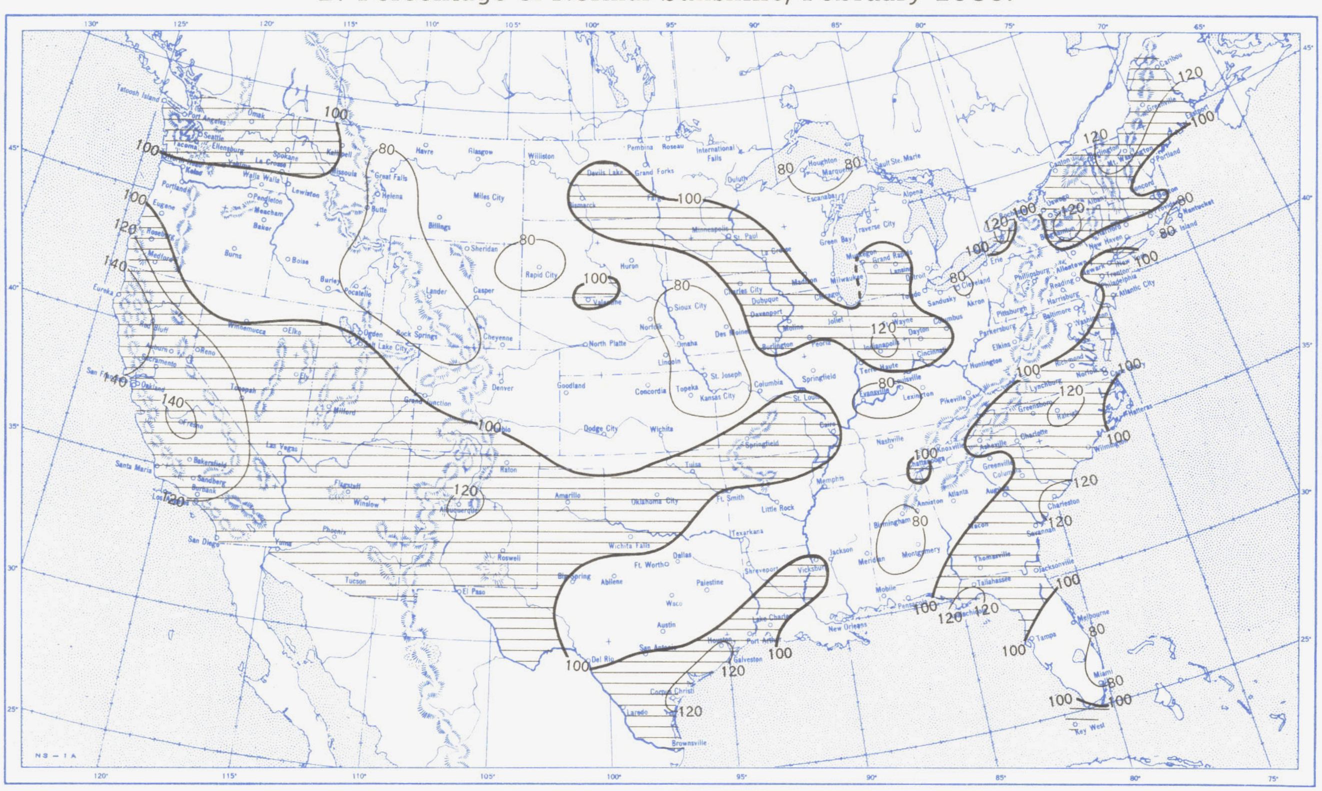


A. In addition to cloudiness, sky cover includes obscuration of the sky by fog, smoke, snow, etc. Chart based on visual observations made hourly at Weather Bureau stations and averaged over the month. B. Computations of normal amount of sky cover are made for stations having at least 10 years of record.

Chart VII. A. Percentage of Possible Sunshine, February 1955.



B. Percentage of Normal Sunshine, February 1955.



A. Computed from total number of hours of observed sunshine in relation to total number of possible hours of sunshine during month. B. Normals are computed for stations having at least 10 years of record.

Chart VIII. Average Daily Values of Solar Radiation, Direct + Diffuse, February 1955. Inset: Percentage of Normal Average Daily Solar Radiation.

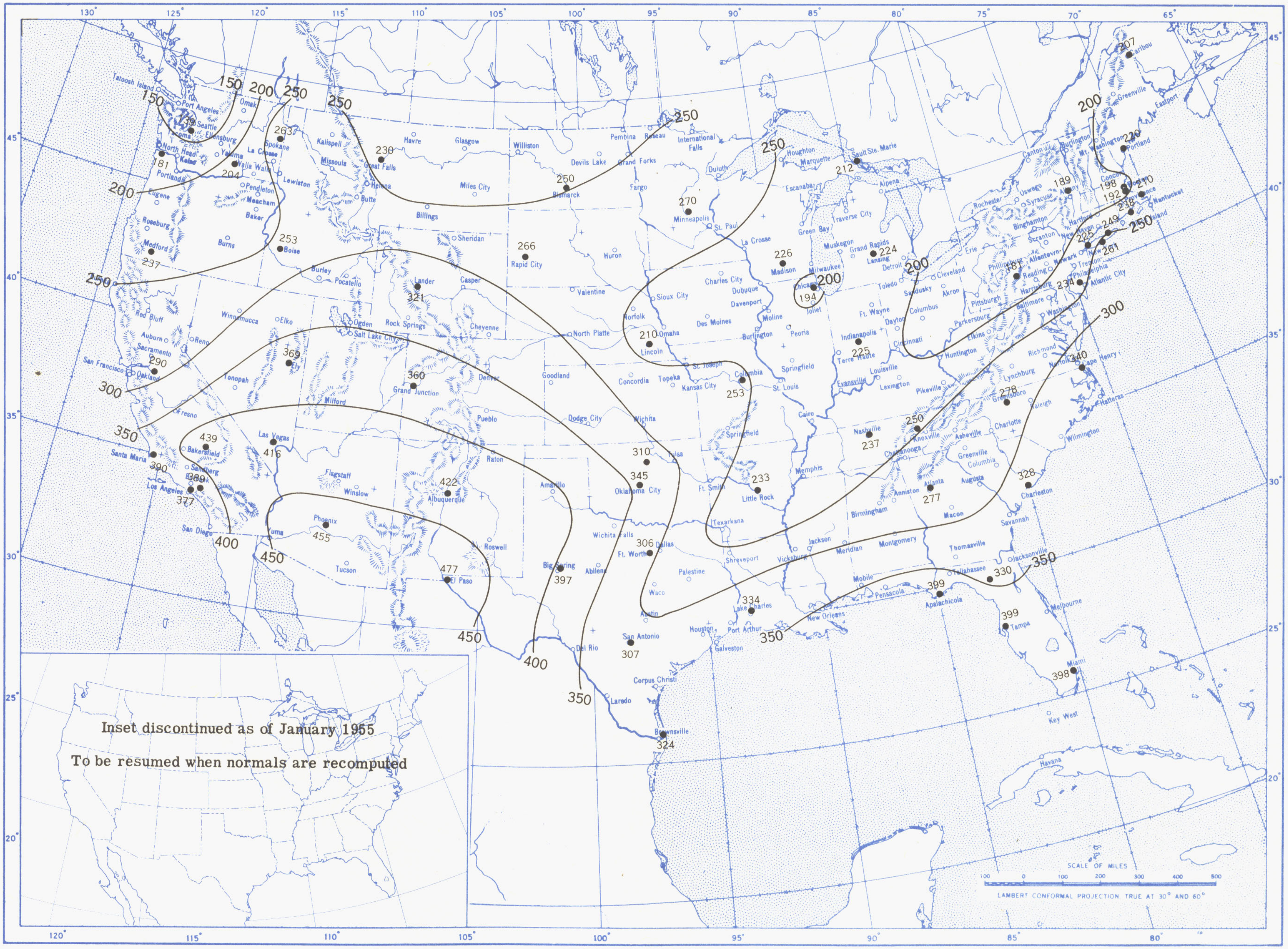
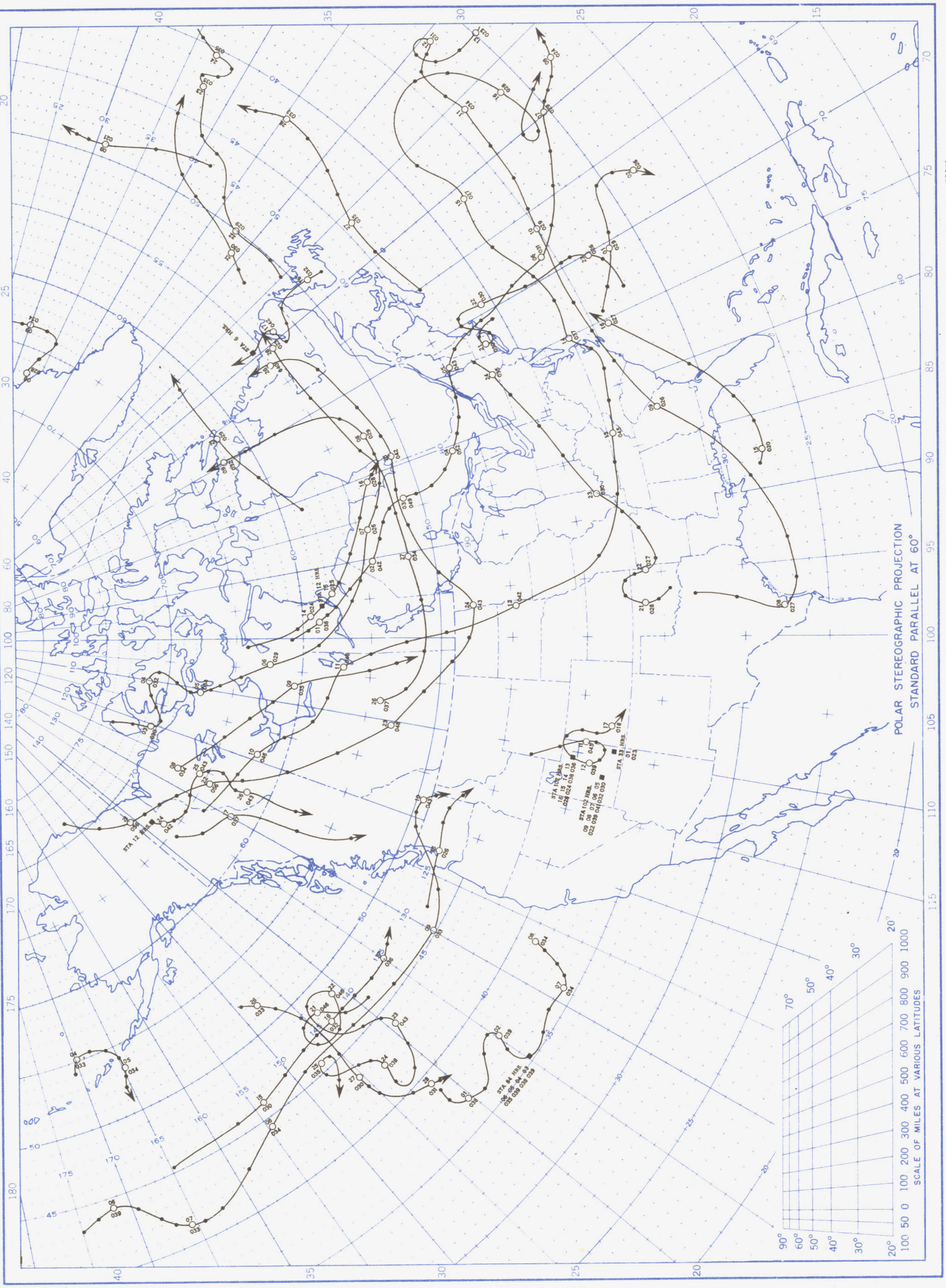


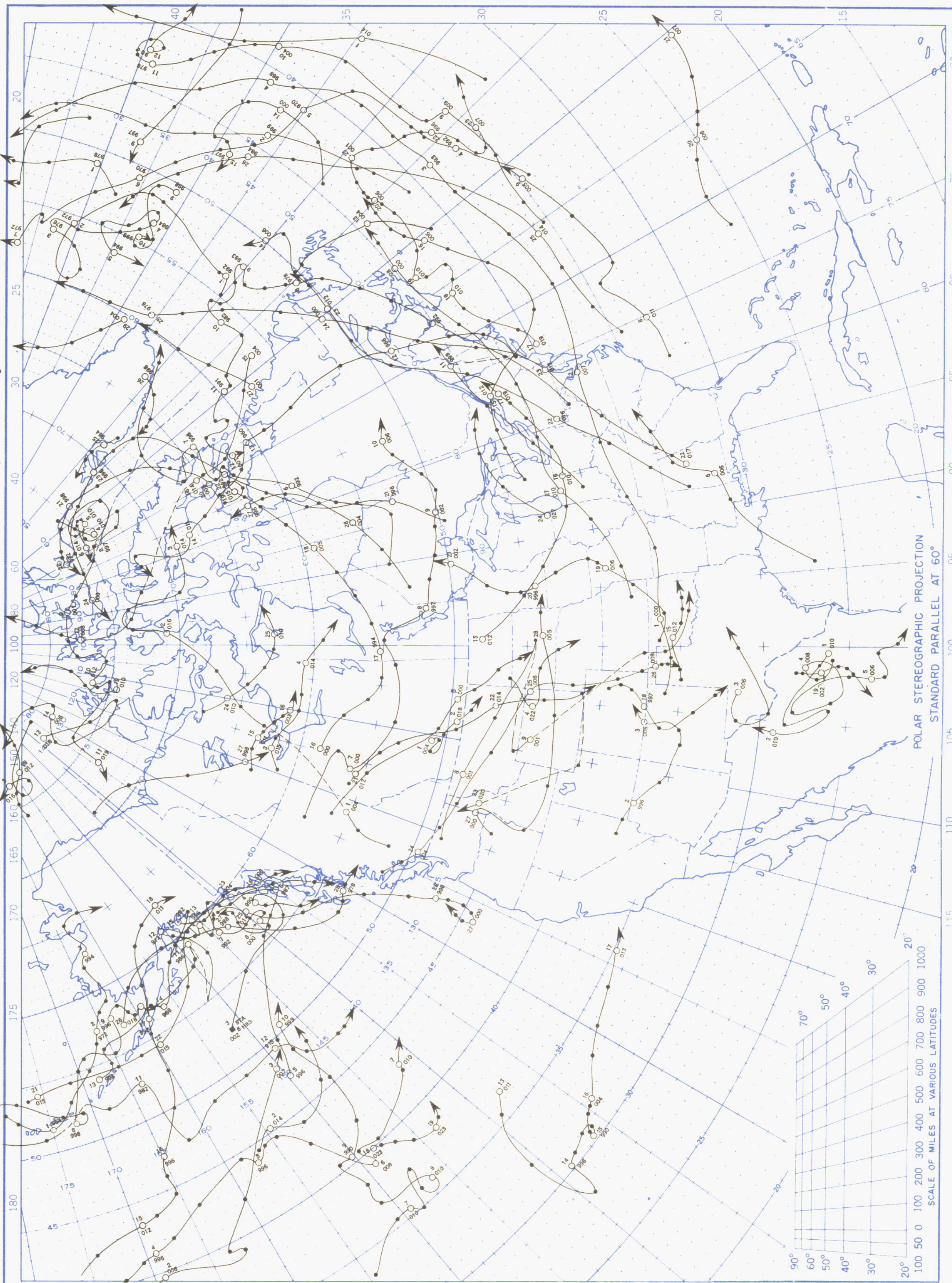
Chart shows mean daily solar radiation, direct + diffuse, received on a horizontal surface in langleys (1 langley = 1 gm. cal. cm.$^{-2}$). Basic data for isolines are shown on chart. Further estimates are obtained from supplementary data for which limits of accuracy are wider than for those data shown.

Chart IX. Tracks of Centers of Anticyclones at Sea Level, February 1955.



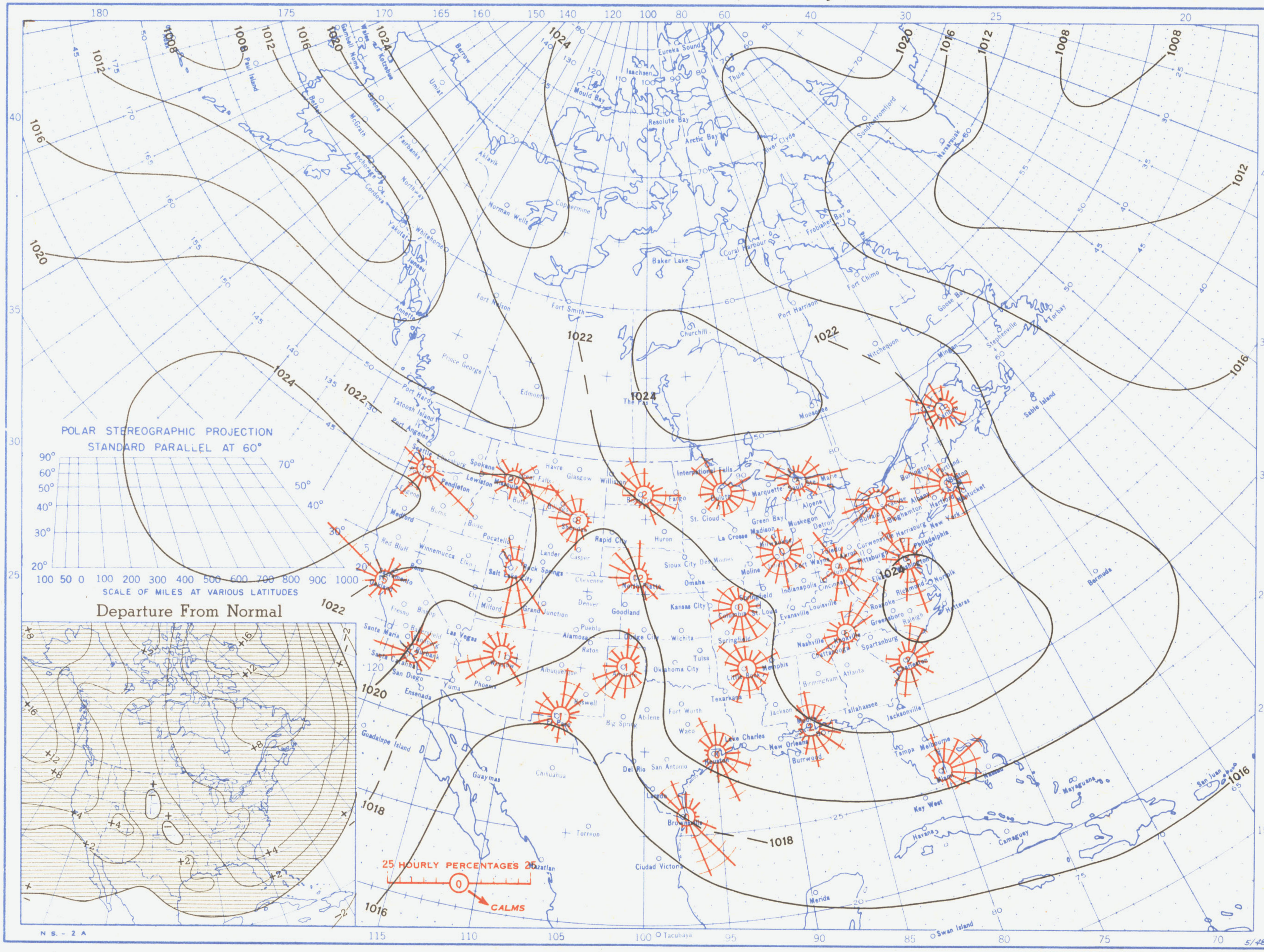
Circle indicates position of center at 7:30 a. m. E. S. T. Figure above circle indicates date, figure below, pressure to nearest millibar. Dots indicate intervening 6-hourly positions. Squares indicate position of stationary center for period shown. Dashed line in track indicates reformation at new position. Only those centers which could be identified for 24 hours or more are included.

Chart X. Tracks of Centers of Cyclones at Sea Level, February 1955.



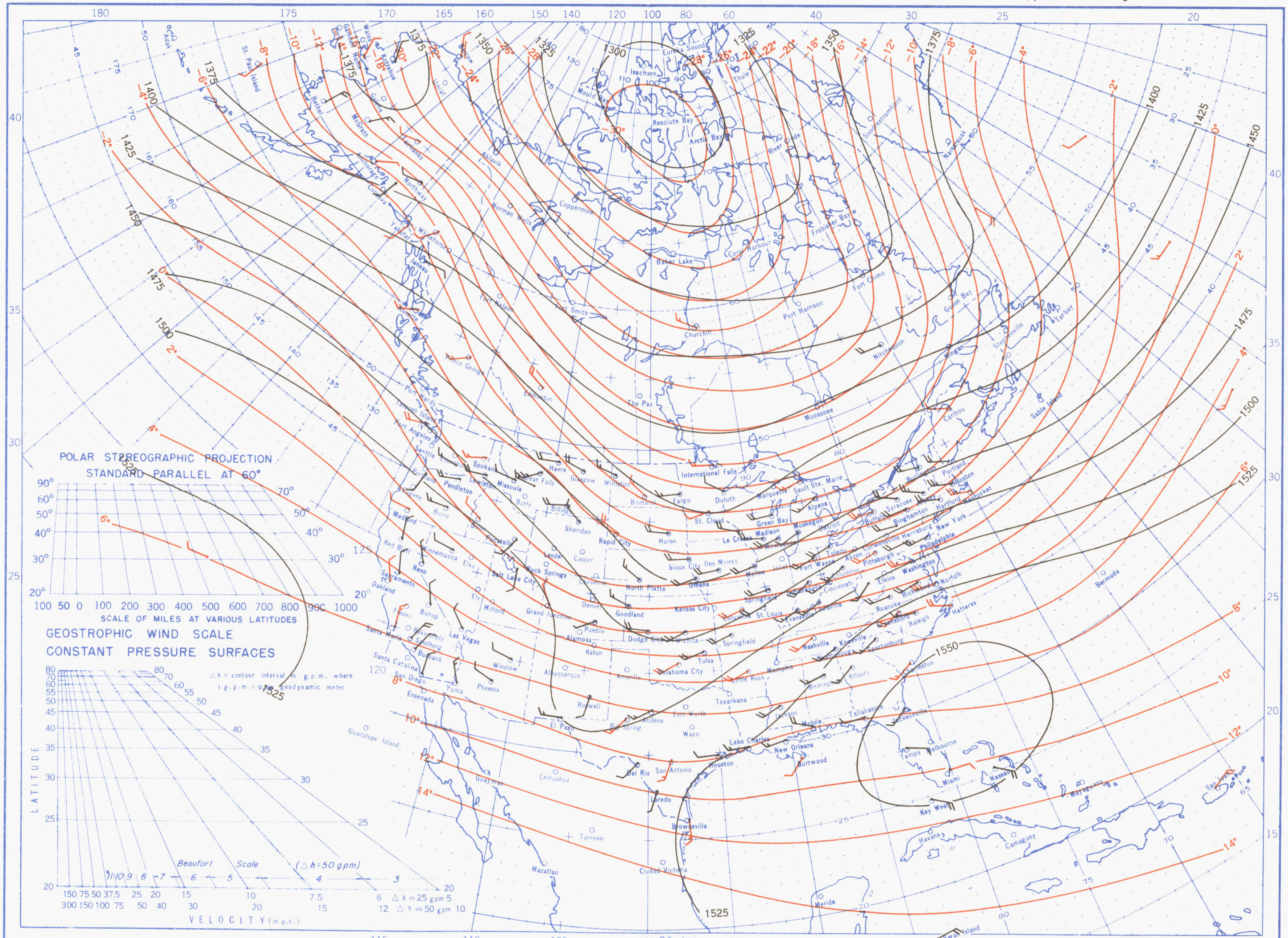
Circle indicates position of center at 7:30 a.m. E. S. T. See Chart IX for explanation of symbols.

Chart XI. Average Sea Level Pressure (mb.) and Surface Windroses, February 1955. Inset: Departure of Average Pressure (mb.) from Normal, February 1955.



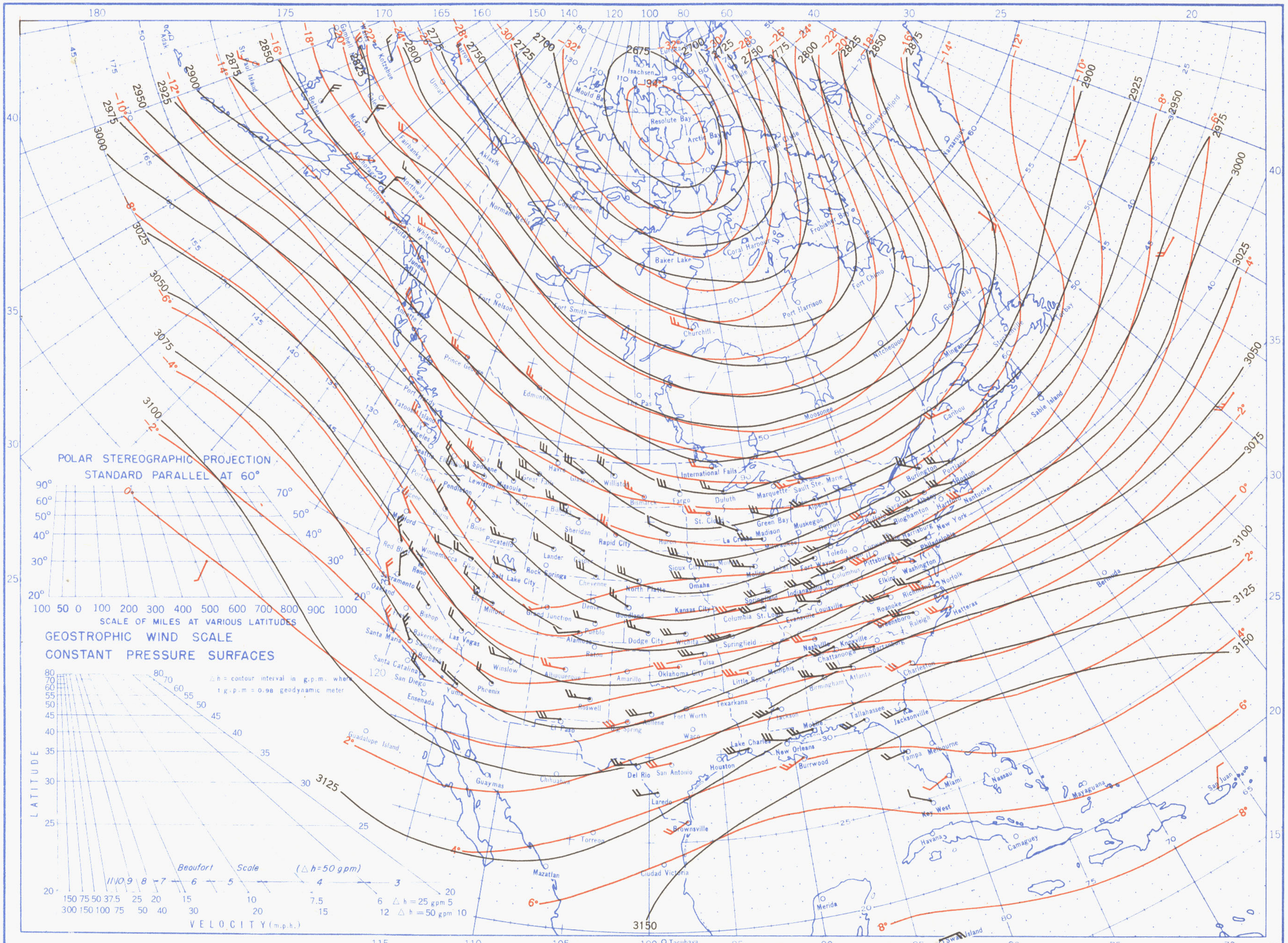
Average sea level pressures are obtained from the averages of the 7:30 a.m. and 7:30 p.m. E.S.T. readings. Windroses show percentage of time wind blew from 16 compass points or was calm during the month. Pressure normals are computed for stations having at least 10 years of record and for 10° intersections in a diamond grid based on readings from the Historical Weather Maps (1899-1939) for the 20 years of most complete data coverage prior to 1940.

Chart XII. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 850-mb. Pressure Surface, Average Temperature in °C. at 850 mb., and Resultant Winds at 1500 Meters (m.s.l.), February 1955.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XIII. Average Dynamic Height in Geopotential Meters (1 g.p.m.. = 0.98 dynamic meters) of the 700-mb. Pressure Surface, Average Temperature in °C. at 700 mb., and Resultant Winds at 3000 Meters (m.s.l.), February 1955.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins taken at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

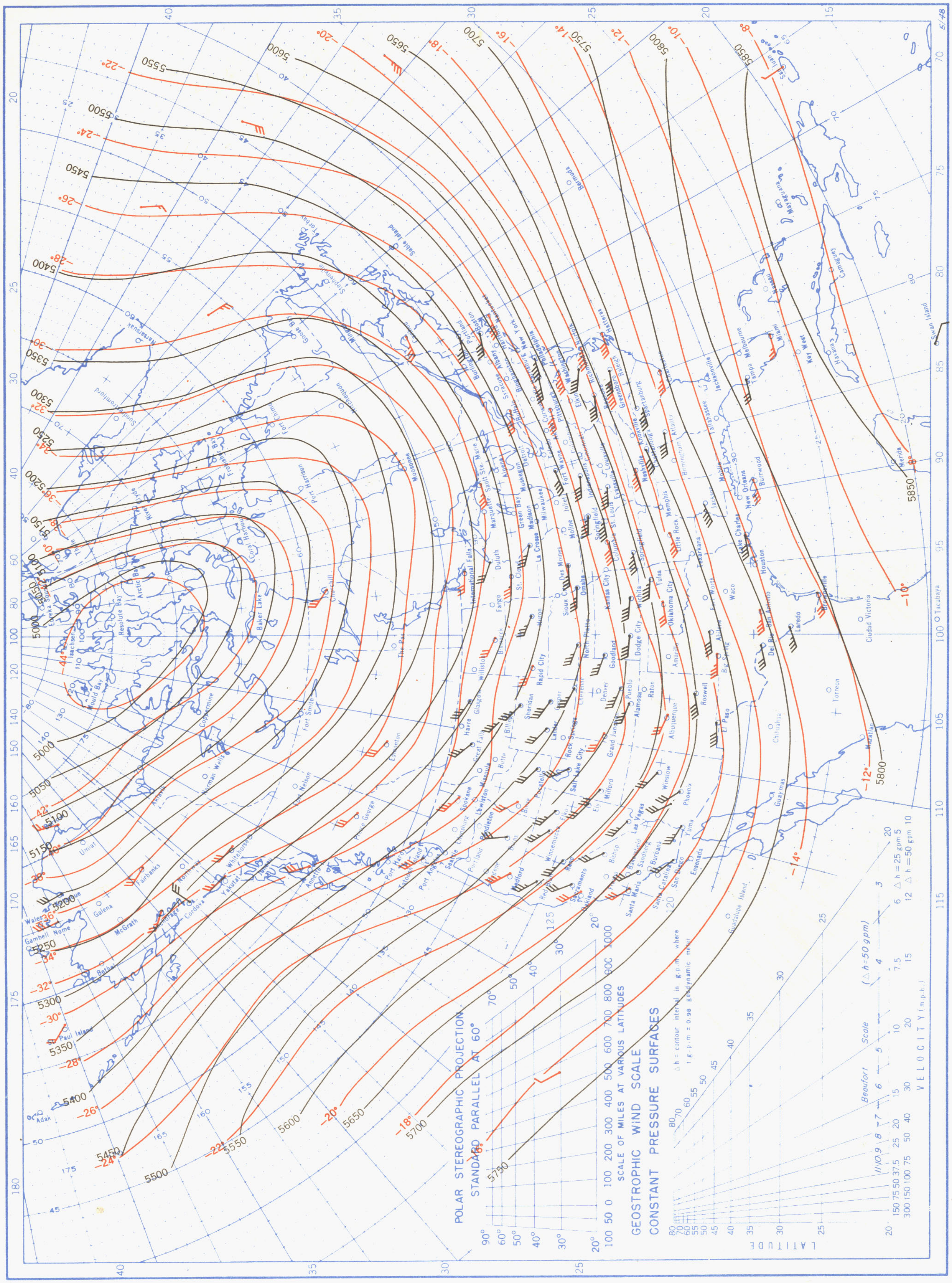
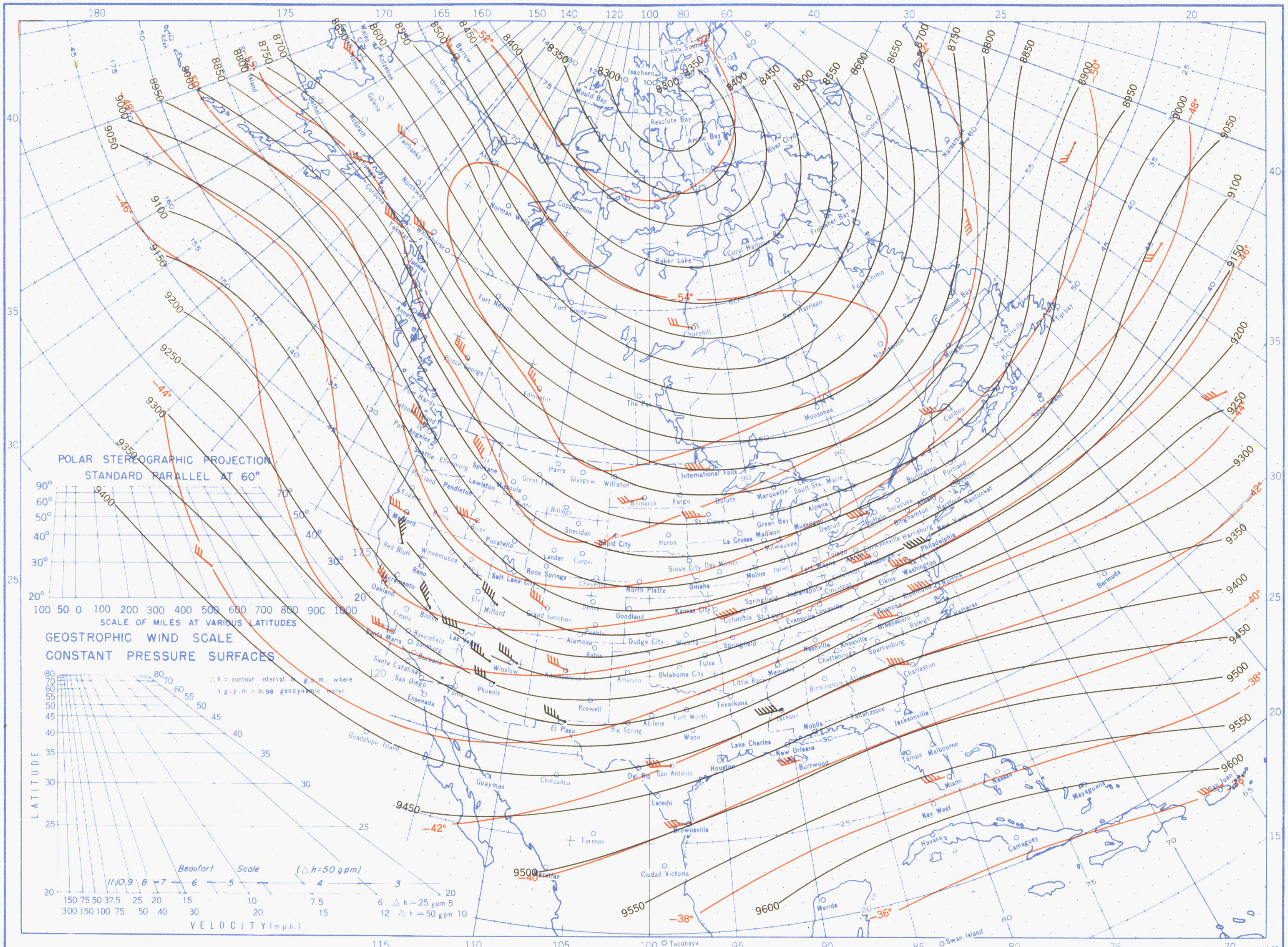


Chart XIV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 500-mb. Pressure Surface, Average Temperature in °C. at 500 mb., and Resultant Winds at 5000 Meters (m.s.l.), February 1955.

Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.

Chart XV. Average Dynamic Height in Geopotential Meters (1 g.p.m. = 0.98 dynamic meters) of the 300-mb. Pressure Surface, Average Temperature in °C. at 300 mb., and Resultant Winds at 10,000 Meters (m.s.l.), February 1955.



Contour lines and isotherms based on radiosonde observations at 0300 G. M. T. Winds shown in black are based on pilot balloon observations at 2100 G. M. T.; those shown in red are based on rawins at 0300 G. M. T. Wind barbs indicate wind speed on the Beaufort scale.