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**Climatic Provinces of China**

BY

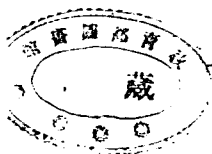
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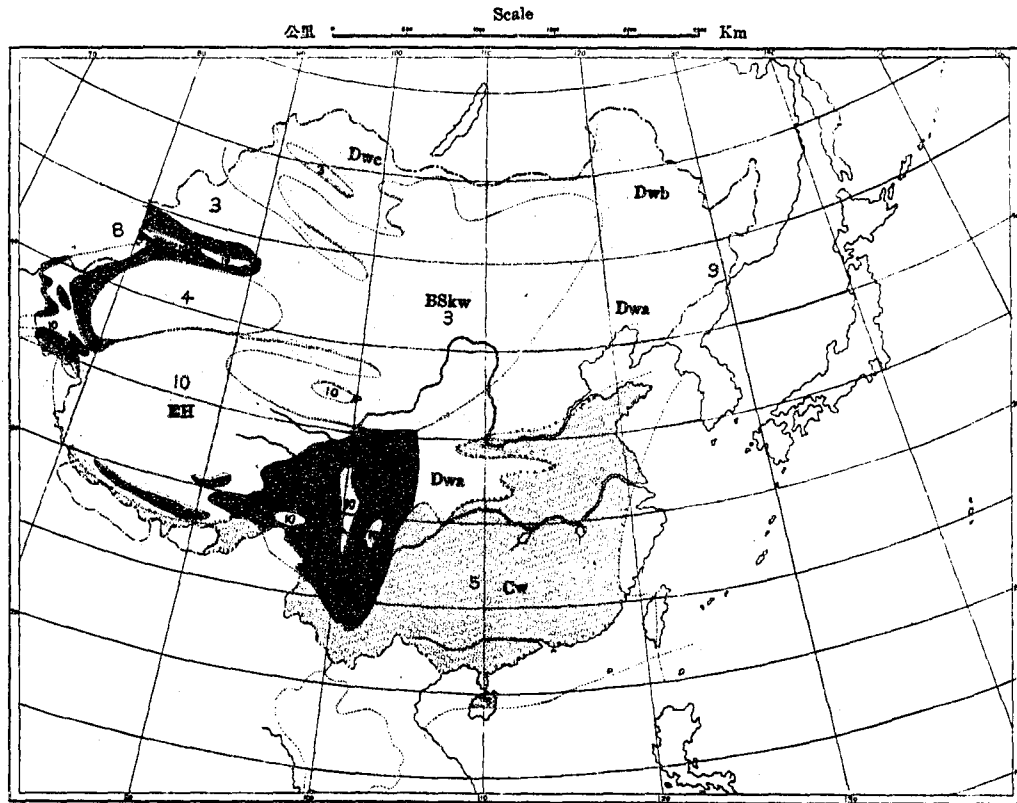


Fig. 1. Climatic Provinces of China—according to W. Koeppen

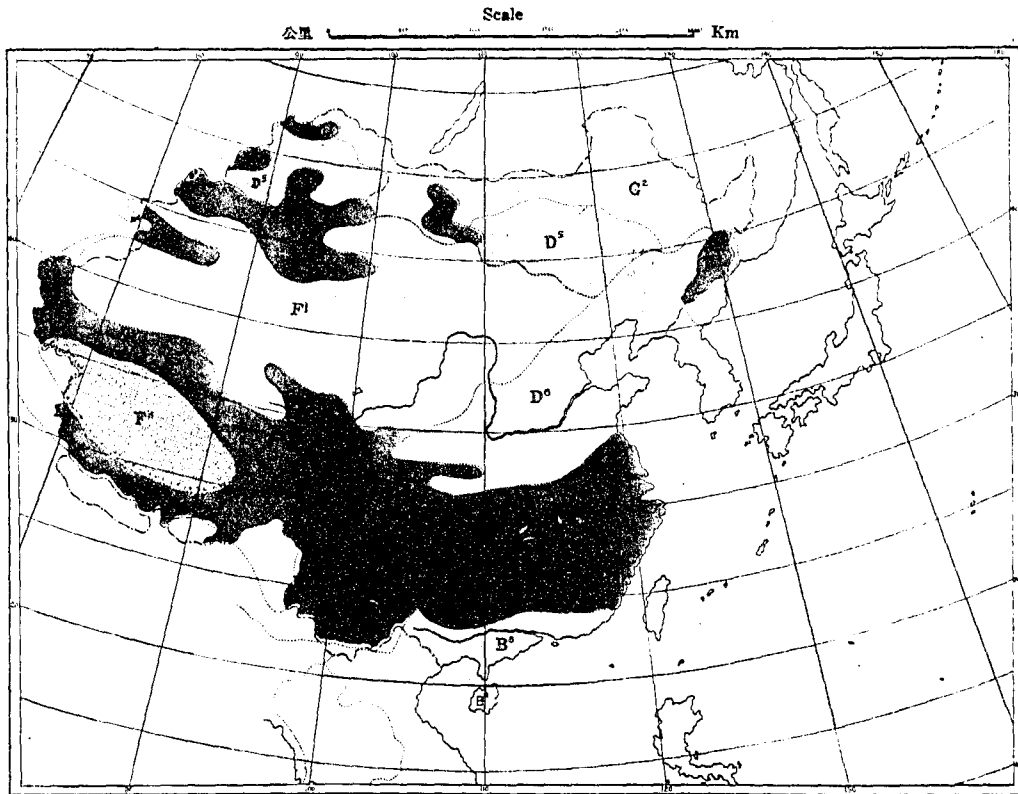


Fig. 2. Climatic Provinces of China—according to Emm. de Martonne

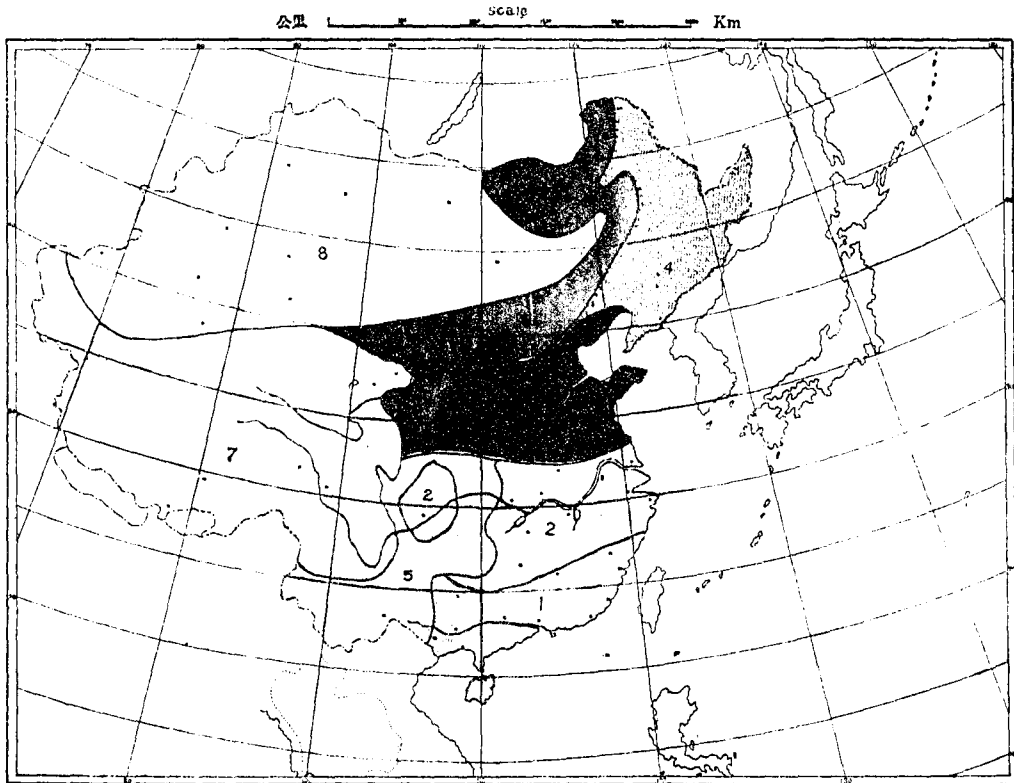


Fig. 3. Climatic Provinces of China, A New Classification

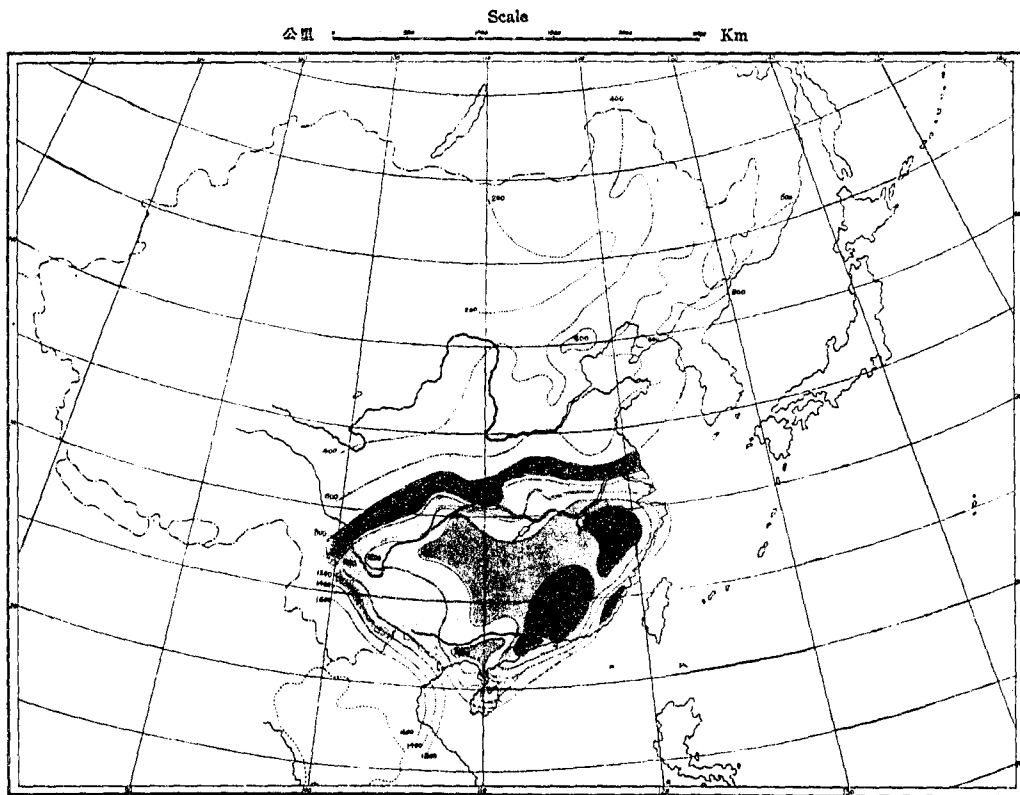


Fig. 4.      Rainfall Map of China—according to E. Gherzi  
The isohyets of Manchuria and Mongolia are according to  
N. Murakoshi's Rainfall map of Manchuria and Mongolia.

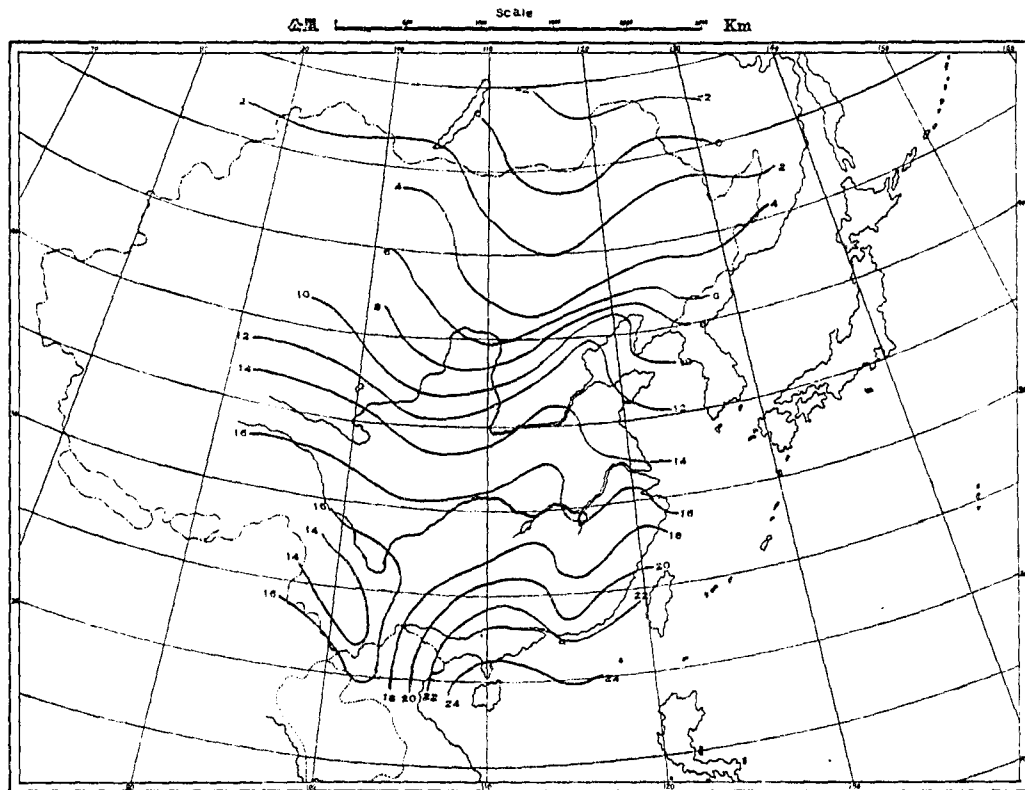


Fig. 5. Mean Annual Isothermal Map of China—according to H Gauthier (in °C)

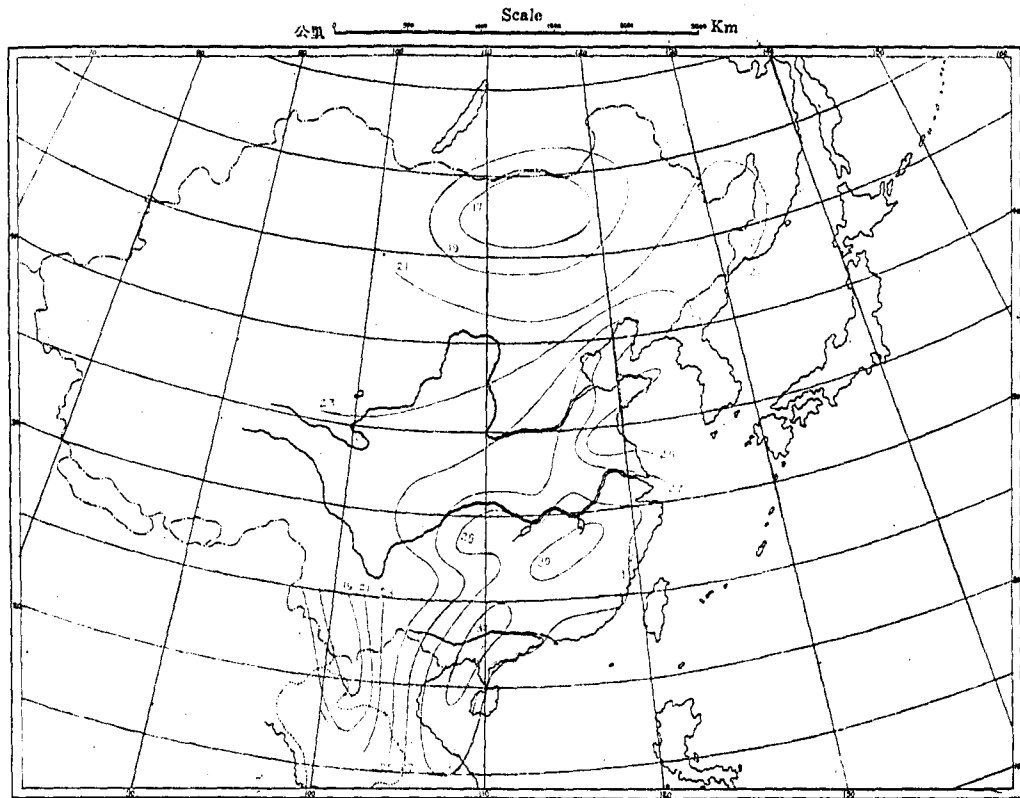


Fig. 6. July Isothermal Map of China—according to H. Gauthier (in °C)



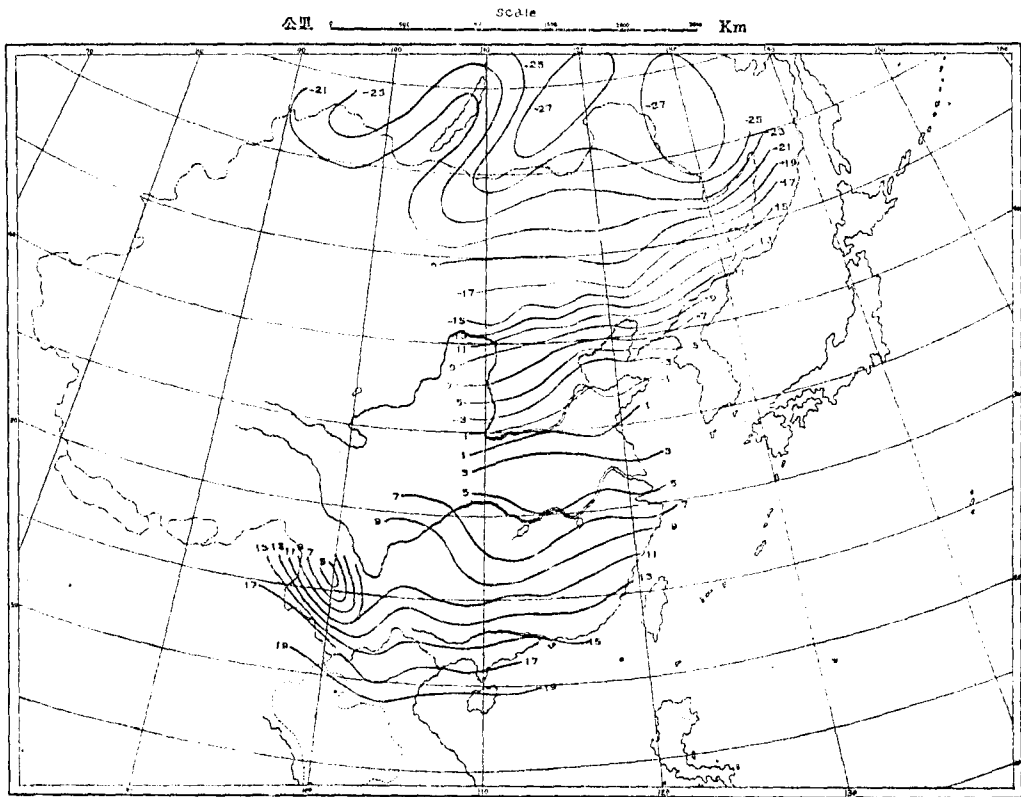


Fig. 7. January Isothermal Map of China—according to H. Gauthier (in °C)

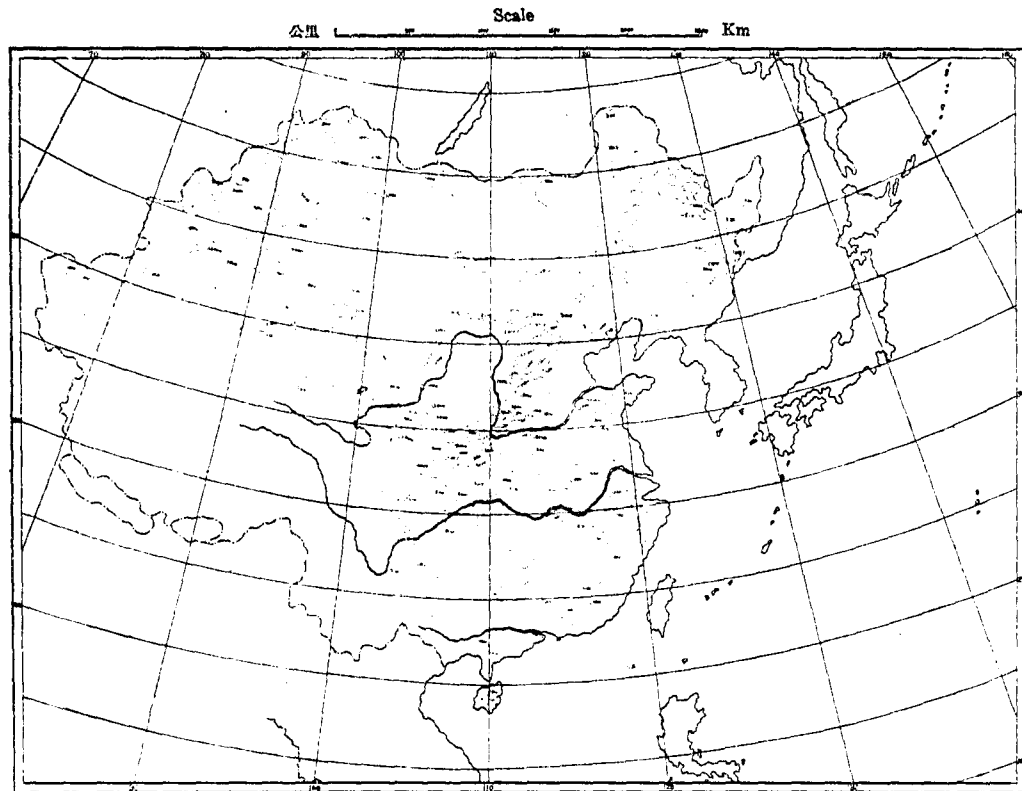


Fig. 8. Hypsometric Map of China

## CLIMATIC PROVINCES OF CHINA.

BY COCHING CHU

In area China is larger than the continent of Europe or Australia. The climate of China varies from the tropical heat in the Hainan Island to the arctic rigor of the Amur province of North Manchuria, from the damp coastal region of the South-east, with a mean annual precipitation well over 2,000 mm., to the desert of Sinkiang, where a year may pass with only a few millimeters of rain. In dealing with the climatology of a country so extensive in area and so diversified in climate, it is necessary to adopt some scheme of classification into climatic provinces or regions.

In making any classification of climatic regions in China, we must keep in view the following considerations.<sup>1</sup>

- (a) The classification must be simple but definite.
- (b) The separate divisions should agree with the natural regions of the country, and if possible with the political units of the first order.
- (c) The cyclonic and anticyclonic controls in China differ greatly in their effect in different parts of the country, the climatic provinces should be determined with due regard to this control. For instance, during the month of June, strings of depressions usually pass over the Yangtze Valley, causing the well-known Mai-U rainy season in this region which is absent in North China and has a modified effect in South China.

So far as the writer knows, no climatic subdivision has ever been devised specifically for China from the purely meteorological point of view. Many schemes, however, have been suggested for the subdivision into climatic regions for the continent of Asia or for the whole world. Prof. E. Obst, of Hannover, has ably summed up the different kinds of classification of world climates in a joint work with Prof. A. Defant on

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<sup>1</sup> Refer Prof. Robert Dec Ward "The Climates of the United States," Boston, 1925, Chap. 3, Climatic provinces of the United States, p. 25, Essential of a working scheme of climatic provinces.

"Lufthuelle und Klima."<sup>2</sup> Under the heading of "Meteorologische Klimaklassifikationen, Obst reviews the devices of E. de Martonne, A. Hettner, A. Philippson, H. Wagner, and W. Koeppen. He considers W. Koeppen's classification, first published in Pettermann's Mitteilungen,<sup>3</sup> the best of all, and he follows Koeppen's system in discussing the climates of different parts of the world. Koeppen himself, however, has later amplified his classification and embodied it into his now well known work "Die Klimate der Erde."<sup>4</sup> It has been learned from authoritative sources that in the forthcoming "New Handbook of Climatology," a three volume work, of which Koeppen and Geiger of Munich are the general editors, his system of classification will be followed.<sup>5</sup>

In view of comprehensiveness and popularity of Koeppen's system of classification it has been applied in the present discussion to the climates of China. The boundaries of different provinces or regions are taken from his map published in Pettermann's Mitteilungen (Jahrgang 1918, Tafel 10) which is larger and clearer than the one attached to his book "Die Klimate der Erde."

Table 1. Climatic Provinces of China according to Wladimir Koeppen's system.

No.	Type Name.	Criteria.	Regions included.
3 BSkw	Cold steppe dry-winter type.	Precipitation small, (less than 50 cm. where the mean annual temperature is 15° C., less than 40 cm. where the mean annual temperature is 10° C.) Mean annual temperature below 18° C., but the monthly temperature of the warmest month above 18° C.	Inner Mongolia with the exception of the greater part of Jehol, southern part of outer Mongolia and Altai region, central part of Kokonor, the province of Kansu, and northern part of Shansi and Shenzi.
4 BWk	Cold desert type.	Precipitation scanty (less than 25 cm. when the mean annual temperature is 15° C., less than 20 cm. when the mean annual temperature is 10° C.). Mean annual temperature below 18° C. but the mean temperature of warmest month over 18° C.	The Takla Makan desert of Sinkiang.

<sup>2</sup> A. Defant und E. Obst, "Lufthuelle und Klima," Leipzig, 1923. Part 2. "Die Klimate und ihre geographische Verbreitung" von E. Obst, pp. 151-175.

<sup>3</sup> W. Koeppen "Klassifikation der Klimate nach temperatur, Neiderschlag und Jahreslauf," "Pettermann's Mitteilungen," 1918, pp. 193-203, 243-248.

<sup>4</sup> W. Koeppen "Die Klimate der Erde," Berlin und Leipzig, 1923. Teil 2, "Das geographische system der Klimate."

<sup>5</sup> G. Walker, "A New Handbook of Climatology," The Meteorological Magazine, January, 1929.

## CLIMATIC PROVINCES OF CHINA

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No.	Type Name.	Criteria.	Regions included.
5 Cw	Warm dry-winter type.	Mean temperature of coldest month between 18° C. and -3° C. precipitation of rainiest month in summer is at least 10 times as much as that of the driest month in winter.	It comprises all the provinces of China proper south of the Yangtze Valley, and in addition greater part of Shantung and Honan, and the extreme southern part of Shansi, Shensi, and Hopei (formerly Chi-Li).
5 Cfa	Warm wet type.	Mean temperature of warmest month over 22° C., otherwise the temperature condition same as Cw type, but no dry season (amount of precipitation during the driest month in winter is more than one-tenth that of rainiest month in summer.)	A narrow strip of coast from Foochow to Shanghai.
8 Df	Cool wet type.	Mean temperature of coldest month below -3° C., no dry season (Precipitation condition same as Cf type.)	This includes the province of Si-Kang (formerly W. Szechuen), north-western part of Szechuen and Yunnan, south-eastern corner of Kokonor and Tibet, and extreme north-western part of Sinkiang.
9 Dwa	Cool dry-winter type.	Mean temperature of coldest month below -3° C., warmest month over 22° C., dry season in winter.	Large part of Manchuria, Hopei, Shansi, and Shensi; southern part of Honan, and north-eastern part of Szechuen.
9 Dwb	Cool dry-winter type.	Same as above except the mean temperature of warmest month is below 22° C.	Northern part of Amur province of north Manchuria, eastern Kirin, and Outer Mongolia north of Uliasuta.
10 Dh	Tundra of high altitude.	Mean temperature of warmest month below 10° C., but above 0° C.	Greater part of Tibet and Kokonor, extreme western part of Sinkiang.
11 F	Eternal frost.	Mean temperature of warmest month below 0° C.	Himalaya regions.

Köppen's classification as described above, though comprehensive and quite definite, is far from being simple. It is to be admitted that his system is intended for the world at large and not for a single country or continent, and therefore it is not surprising that his types do not happen to agree with the natural regions of China. The type Cfa, warm climate without dry season, along the central coast, is of some significance, as it agrees with the region most frequented by extratropical cyclones during the winter season, when the rest of China has very little precipitation. But the region should extend much farther inland along the Yangtze Valley, indeed, it should include all the lower Yangtze Valley, from

Ichang (Long.  $111^{\circ}$  E.) eastward, for rainfall records of lower Yangtze stations like Chungking, Hankow, Yochow, Kuikiang, Wuhu, Nanking, Chinking, etc., all show that the amount of precipitation during the driest month in winter exceeds one-tenth the amount of rainiest month in the year,<sup>6</sup> which fact, according to Koeppen's definition, would make all this region belong to type Cfa.

The extension of the type Cfa westward up to Ichang or Chungking will, however, break the type 5 Cw, into two, separating north China (the Yellow River Valley) from south China, which differ greatly from each other in rainfall amount as well as in winter temperature as can be seen in the isohyetal and January isothermal charts.

The southern wedge of Koeppen's type 9 Dwa, into central China is also doubtful. It would credit southern Honan and northern Hupei, *i.e.*, the upper stretches of Han and Hwai Rivers, with a January mean temperature of  $-3^{\circ}$  C. or less, which is far from the fact, as there are no high mountains in this region. Hence it seems that the boundaries of Koeppen's types with regard to China, as shown in his map in "Die Klimate der Erde" need some revision; and his classification in general is not very suitable to be applied to the climates of China.

Prof. Obst considers Martonne's classification given in the first edition of his standard textbook "Traité de Géographie Physique," as not definite enough. Martonne, however, modified his classification of climatic types somewhat in the latest edition of his work;<sup>7</sup> he reduced the eight or nine climatic groups of his former editions into four big groups, warm climates, temperate and cold climates, desert climates, and monsoon climates; and made the characteristics of each type even less definite. Martonne's classification, hence, is much more flexible than Koeppen's, and when applied to China, his types agree much better with the natural regions of the country. In the following table the boundaries of different types are taken from Martonne's "Carte des Climats" attached to the first volume of his work "Géographie Physique," fourth edition.

Table 2. Climatic Provinces of China according to Emm. de Martonne's system.

No.	Type Name.	Criteria.	Regions included.
B6	Central India type.	Mean annual temperature above $20^{\circ}$ C., monsoon variety.	Greater part of Kwangtung and Kwangsi, and southern part of Yunnan.

<sup>6</sup> Ste E. Gherzi, "Etude sur la Pluie en Chine," 2<sup>e</sup> partie, Tableaux généraux, Shanghai, 1928.

<sup>7</sup> Emm. de Martonne, "Traité de Géographie Physique." Quatrième édition, Paris, 1925. Chap. 6, Types de climats, pp. 229-261.

No.	Type Name.	Criteria.	Regions included.
C1	Chinese type.	Mean annual temperature below 20° C., warmest four months over 10° C.	The Yangtze Valley provinces.
C4	Mediterranean steppe type (Syria type).	Same as C1, but Summer half year dry.	Southern Sinkiang, along the northern foothill of Kunlun mountains.
C6	Mexican type, (climat chaude d'altitude).	Same as C1, but Annual range of temperature small.	Greater part of Yunnan and southern corner of Szechuen.
D5	Ukraine type (steppe).	Mean annual temperature under 10° C., summer cool.	North-eastern Charhar north-western Jehol, and Outer Mongolia, north of Uliasuta.
D6	Manchuria type.	Same as D5, rainy season in summer.	The provinces of Shantung, Honan, Hopei, southern part of Shansi and Shensi, greater part of Fengtien (now Liangning), and south-western corner of Kirin.
F1	Aral type.	Mean annual precipitation below 25 cm., annual range of temperature high.	The province of Kansu, greater part of Sinkiang, northern part of Kokenor, western half of Inner Mongolia, and south-eastern part of Outer Mongolia.
F3	Tibetan type.	Mean annual precipitation below 25 cm.	Tibet.
G2	Siberian type.	At least four months with a mean temperature above 10° C.	Province of Amur, northern Kirin, and north-eastern part of Outer Mongolia.
H1	Himalaya type.	Without warm season.	Top of high mountains and plateaux.

Martonne considers a region has dry climate when the mean annual precipitation in terms of centimeters is less than double the value of mean annual temperature in degrees centigrade.<sup>8</sup> Apparently this rule cannot be applied in north Manchuria or Mongolia, where the mean annual temperature goes down to 5° C. or even below 0° C. Koeppen's definitions of steppes and deserts are more practicable. According to his scheme given in his paper "Klassifikation der Klimate nach Temperatur, Niederschlag und Jahreslauf," in the regions of Manchuria and Mongolia, the greater part of which has the mean annual temperature varying from 10° C. to 5° C., a district with annual precipitation of 30-40 cm. would be called a steppe, while that with only 15-20 cm., a desert.<sup>9</sup>

<sup>8</sup> Ibid, p. 233.

<sup>9</sup> Pottermann's Mitteilungen, 1918, p. 200. Koeppen has modified his definitions of "steppe" and "desert" in "Die Klimate der Erde," as given on pp. 121-122 of the latter book. His revised scheme is more complicated, and would raise the rainfall limit of "steppe" and "desert" in Manchuria and Mongolia considerably.

In other respects, however, Martonne's system fits in better with the cyclonic and anticyclonic controls as well as with the natural and physiographic regions in China. His three types B6, C1, and D6 in China proper practically coincide with the traditional divisions of north, central, and south China. The type C4, or Mediterranean steppe along the northern foothill of Sinkiang is interesting, but whether the seasonal distribution of rainfall there warrants such a classification is doubtful. The boundaries of type D5 need modification in view of recent rainfall data collected in Manchuria and Mongolia, and the type H1 probably covers too large an area.

In a recently published book "Asie des Moussons," volume 1, Prof. Jules Sion of University of Montpellier has given us a very lucid and accurate summary of climate of China in the chapter on climate.<sup>10</sup> Figure 6 in this book is a chart of climatic types of Far East, or monsoonal regions of Asia. He divides the climates of China into six types as follows:

(1) Warm climate, Hongkong type, where the mean monthly temperature in winter is below 25°C. at least in two months, and below 10°C. at most in four months. This comprises China proper south of Tsin-ling mountains with the exception of a part of Yunnan and Szechuen. In the chart this region is traversed by a line 'Limité des régions sans aucun mois sec,' dividing it into variété continentale in the west and variété maritime in the east. This boundary line, which separates the districts in central China with dry winter from those wet all the year round, is a much truer representation of facts than the one given in Koeppen's chart, although Sion follows Martonne in defining the word "dry".<sup>11</sup>

(2) Warm climate, Calcutta type; places in this subdivision have more than two months dry, and maximum temperature occurs in April-May, otherwise the characteristics are the same as (1). Yunnan and Kweichow belong to this region according to the chart. While we still know very little of this part of the country, the data on temperature we get from Quan-Ming (formerly Yunnanfu) and Tengyuen do not justify such a classification.

(3) Temperate climate, warm variety; this subdivision has more than four months with a mean temperature below 10°C. and less than four months with a mean temperature below 0°C. It consists of lower Valley of the Yellow River and Shantung Peninsula.

<sup>10</sup> Géographie Universelle, Tome 3, "Asie des Moussons," par Jules Sion, première partie, Chine-Japon. Paris, 1928. Chapter 1, Le Climat.

<sup>11</sup> *Ibid.*, footnote of p. 15.



(4) Temperate climate, cool variety; mean monthly temperature of the coldest month in this region below  $-2^{\circ}\text{C}.$ , otherwise the characteristics are the same as the previous subdivision. The January isotherm of  $-2^{\circ}\text{C}.$  is chosen, for it represents fairly well the boundary between regions that are covered with snow in winter and those which are not. This includes northern Szechuen, part of Kansu, and greater part of Shansi, Shensi, and Hopei.

(5) Cold climate, Manchurian type; no definite criteria have been given for this region. Generally speaking, the temperature is very cold in winter (mean January temperature in Mukden  $-13^{\circ}\text{C}.$ ) but quite warm in summer (mean July temperature in Mukden  $24^{\circ}\text{C}.$ ), precipitation sufficient for the growing of wheat. Manchuria east of Khingan mountains belongs to this subdivision.

(6) Cold climate, High Steppe type; this region receives less than 40 cm. of precipitation in a year. The boundaries were left open owing to lack of data in Mongolia, Tibet, and Sinkiang.

It is clear from the above description that Prof. Sion's classification, while specifically made for eastern Asia, follows Martonne's scheme in certain ways, but his criteria of different climatic regions are more definite and quite well chosen.

Temperature, precipitation, and annual distribution of these two elements, will always be the main factors in demarcating different climatic provinces. In dealing with climates in China, there are certain essential points that need to be taken into consideration. The isotherms in China generally run from east to west, the trend of isohyets, however, inclines from north-east to south-west. In China proper, where the rainfall is abundant, temperature becomes the vital factor; while in Mongolia, Manchuria and Sinkiang, where the precipitation amounts to very little, rainfall is of more importance for delimiting climatic regions. Since in summer high temperature of  $20^{\circ}\text{C}.$  or more prevails practically all over China, it is the winter temperature that concerns us the most.

Rainfall régime varies in different parts of China.<sup>12</sup> In north China (*i.e.*, the Yellow River Valley) and Manchuria, the maximum precipitation almost always occurs in July, the winter and spring being very dry. Thus at Peiping (formerly Peking) 91% of the annual total falls in the months

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<sup>12</sup> W. G. Kendrew has given a good account of rainfall régimes of China in his book "The Climates of the Continents." 2nd Ed. Oxford, 1927, pp. 135-137.

May to September. In the lower Yangtze Valley, *i.e.*, from Hankow seaward, the month of June, when Mai-U takes place, receives usually the most precipitation, with a secondary maximum in August. There is even a third maximum in April, for rainfall in this month exceeds that of May. Spring receives more precipitation than autumn, and winter is comparatively wet. In the upper Yangtze Valley, in the provinces of Szechuen and Yunnan, the maximum usually falls in July, winter receives very little rain, and spring is drier than autumn as the rainfall data of Chungking, Chengtu, Quenming (Yunnanfu) and Mengtze all show. Hence the rainfall régime here resembles that of north China. In south China, the rainfall régime differs widely from place to place, partly because of local topography, and partly due to the rainfall shadow effect of Formosa Island, which effect is most apparent near Amoy.<sup>13</sup> The rainfall maximum occurs most frequently in June or August, typhoons contribute to a certain extent to the abundance of rain during these months. Spring here receives more rainfall than autumn, as the following table shows. In this respect it partakes the characteristics of lower Yangtze valley.

Table 3. Percentages of Seasonal Rainfall Distribution.

	Spring	Summer	Autumn	Winter
N. Chinese coast	11.4	62.1	18.2	5.3
Lower Yangtze Valley	27.1	42.2	20.9	9.5
S. Chinese coast	27.1	41.9	17.5	13.1

With a few exceptions such as Tsingtao, the maximum temperature in China usually occurs in the month of July. The mean annual range of temperature varies greatly from north to south; for instance, it is only 12° C. at Hongkong and 13° C. at Quenming, but at Aigun, in north Manchuria, it increases to 46°, at Urga in Mongolia 45°, and at Lukchun in Sinkiang 43°. Mongolia, Manchuria, and North China all have a high degree of continentality, the Siberian anticyclone gives to this region a very low winter temperature. In Central and South China the winters are much milder. But compared with the mean temperature of places situated on the same latitude, Nanking still has a negative anomaly of 3°.7; and Hongkong located just within the tropics, has the lowest mean temperature at sea level for the coldest month in the same latitude in the northern hemisphere. Calculated according to Zenker's method,<sup>14</sup> Peiping has a continentality of 77, and Urga 95. The high degree of

<sup>13</sup> In Amoy the rainfall decreases in July and then increases again in August. Besides, Amoy (117.6 cm.) receives less precipitation than either Foochow (151.5 cm.) to the north, or Swatow (150.9 cm.) to the south of it.

<sup>14</sup> J. Hann "Handbuch der Klimatologie," 3rd Ed., Stuttgart, 1908. Vol. I, p. 332.

continentality together with remarkable clear sky in the spring cause the mean temperature of April in Peiping, Kirin, Harbin, Changchun and other inland localities in north China and Manchuria to be higher than the mean temperature of October. It is interesting to note that during the spring month, when Yangtze Valley has its Mai-U, or Plum rain, Peiping is actually warmer than Shanghai, as the following figures show:

	Latitude	Mean monthly temperature.			
		October	April	May	June
Peiping	39° 50'N.	12°.5	13°.8	20°.0	24°.3
Shanghai	31° 12'N.	17°.4	13°.4	18°.6	22°.9

Since China has often been classified as the land of monsoons, in discussing the climates of China, we cannot leave the subject without touching upon the wind régimes. Generally speaking, the prevailing winds in winter are north-westerly in north China and Manchuria, northerly in central China, and north-easterly in south China. In summer the prevailing winds over all China are southerly or south-easterly. These winds are not as constant as monsoons in India, they are often interrupted by cyclonic circulations. The common statement that a south-east monsoon brings rain to China in summer needs certain qualifications. In Nanking the rainfall probability with southerly winds is much smaller than that with northerly winds in winter as well as in summer. The southerly wind probably needs to be lifted up by the cooler northerly current before the moisture in it can condense and cause rain. It is to be noted that during the passage of cyclones in the Yangtze Valley, the precipitation does not usually commence until the pressure is rising and wind turns to the north-east. Indeed, we cannot understand the real nature of monsoon winds in China until we make a careful study of the conditions of the upper air by means of balloons and kites.

Taking due regard of the above facts and the three points stated at the beginning of this paper, the following major climatic provinces are offered for consideration; the boundaries of different provinces are liable to change as new stations are established and new data collected, especially in the inland regions.

(1) South China type: this region has a mean temperature in the coldest month (January) over 10°C.<sup>15</sup> The January isotherm of 10° nearly coincides with the mean annual of 18°, the latter, however, is of

<sup>15</sup> The mean annual and mean monthly isotherms are taken from H. Gauthier "La Temperature en Chine," in three volumes, Shanghai, 1918.

less significance than the former. Mean annual range varies from  $12^{\circ}$  to  $20^{\circ}$ . Precipitation exceeds 100 cm. and usually over 150 cm. Typhoons invade this region in the months of June to September, when the maximum of rainfall occurs. The region comprises the provinces of Kwangtung and Kwangsi, southern part of Fukien and Kweichow, and extreme south-eastern corner of Yunnan. It is a little larger than type B6 of Martonne and agrees quite well with the tropical tropophytic forest region of China.<sup>16</sup> Tropical fruits like Lichi, banana, and pineapple are the characteristic products of this region. Three crops of rice a year are raised here.

(2) Central China or Yangtze Valley type: the mean temperature of winter months here goes below  $10^{\circ}$ , its northern boundary is the November isotherm of  $10^{\circ}$  (*i.e.*, it has at most four months of mean temperature below  $10^{\circ}$ ). Mean annual range is higher, varying from  $18^{\circ}$  to  $25^{\circ}$ , and rainfall amount smaller but still over 75 cm. In winter and spring, extratropical cyclones frequent this region, hence winter is comparatively wet and plum rains occur in the months of April—June. The typhoon reaches here only in July and August, and its effect does not go very much inland. It is the region of temperate tropophytic forest; most of the tea produced in China is grown in this region.

(3) North China type: in this region the mean temperature of November is below  $10^{\circ}$ , but above  $0^{\circ}\text{C.}$ , and mean annual above  $10^{\circ}\text{C.}$ , annual range of temperature amounts to  $25^{\circ}$  to  $35^{\circ}$ . It is separated from the region to the west by the isohyetal of 40 cm. Rainfall maximum occurs in the month of July, winter is quite dry. The amount of annual precipitation varies greatly from year to year in this part of the country as well as in the district west of it, hence famines occur very frequently. This region includes all of the provinces of Shantung and Honan, northern Kiangsu and Anhwei, and southern Shensi, Shansi and Hopei. Wheat and millet are the staple crops here instead of rice.

(4) Manchurian type: at least five months with a mean temperature below  $0^{\circ}$ , and mean annual below  $10^{\circ}$ . The growing season is limited only to five or six months, winter is extremely cold here. Liao Ho (Liao River) in south Manchuria is frozen for four months, Sungari river for five months and Amur River in north Manchuria for six months in the year. Annual precipitation varies from 40 to 60 cm., half of it falls in July and August, just about the time the plants need water most. The 40 cm. isohyetal marks the western boundary of this region which

<sup>16</sup> From a "Map of the plant formations in China," prepared by S. S. Chien, of Biological Laboratory, Science Society of China. The map is not yet published.

includes practically all of Manchuria with the exception of the extreme western part. It is a region of narrow-leaved sclerophyll forest. Spring wheat and soy beans are the main agricultural products.

(5) Yunnan plateau: owing to the altitude of this region varying from 1000 m. to 3000 m., it has an ameliorated climate of the tropics. The mean annual temperature is from  $14^{\circ}$  to  $18^{\circ}$ , and annual range amount to only  $12^{\circ}$  to  $15^{\circ}$ . Annual precipitation usually exceeds 75 cm.

(6) Steppe type: this region, comprising north-western corner of China proper, southern part of Jehol and Charhar, and western part of Manchuria, has a mean annual rainfall of 20 to 40 cm., and mean annual temperature of  $5^{\circ}$  to  $10^{\circ}$ , which according to Koeppen's definition would be called a steppe.

(7) Tibetan type: in regions with an altitude over 3000 m.

(8) Mongolian type: the meteorological data of Mongolia, Sinkiang, and Tibet are very meagre, and it will not be advisable to subdivide this vast area. The rainfall amount here is certainly very scanty, but how much of the region belongs to steppe and how much to desert we cannot say at present. Recently the Russians have established seven stations in Outer Mongolia,<sup>17</sup> and Dr. Sven Hedin in his last trip to Sinkiang also found seven meteorological stations along his route, which will soon be taken over by the Chinese Institute of Meteorology.<sup>18</sup> The observations made at these places will certainly elucidate the real climatic conditions of this hitherto unknown region.

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<sup>17</sup> Pettermanns Mitteilungen, 1926, p. 26.

<sup>18</sup> Sven Hedin "Auf grosser Fahrt," Leipzig, 1929.

