民國文獻類編續編

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科學技術卷

993

民國時期文獻保護中心
中國社會科學院近代史研究所 編

國家圖書館出版社

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第九九三册目録

氣 象 年 報

ANNUAL METEOROLOGICAL REPORT

民國十七年
1928

第一卷
VOL. I.

國立中央研究院氣象研究所
南京欽天山北極閣

NATIONAL RESEARCH INSTITUTE OF METEOROLOGY
ACADEMIA SINICA
PEI-CHI-KO, NANKING, CHINA

氣象年報第一卷目錄

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弁　言

氣象研究所爲國立中央研究院之一部，自拾六年夏卽行籌備設立。日常氣象觀測，開始于十七年元旦，每小時觀測一次，日夜不輟。年初九月，觀測地點在成賢街大學院，及中央大學梅庵。至十月初移至欽天山(北極閣)山巔。本編氣壓讀數均以欽天山山巔高度爲準，卽離海平面六十七公尺又拾分之九。本年度觀測伊始，儀器設備，旣不完全，而年初數月，觀測計算，亦時有謬誤，故前印之季刊頗多舛訛。本編關於南京部份，季刊中魯魚亥豕之處，凡發見者均經校正。南京歷年之溫度氣壓雨量雨日等之準平均，係依照日本領事館，金陵大學，及東南大學三處之紀錄。但觀測時間，三處不相一致故各項平均數，未免略有參差之處也。

本編內張君寶堃著有「民國十七年南京風向與天氣之關係」一文，對于本年度風向與各項天氣要素之分析，極爲詳盡。其中最足注意者，厥爲南京降雨，大抵在地面發東北風時，東南風與南風反少降雨，冬夏皆然也。

除南京之紀錄而外，尙附有海關四十四測候所之各月氣象要素之平均。海關人員對于天氣觀測，概盡義務，歷有年所，殊堪欽佩。而海關測候所一切規劃，多賴徐家匯觀象台之指導，開創之功，亦不可沒。承海關稅務司按月惠寄報告，特誌數語，以表謝忱。

國立中央研究院氣象研究所所長竺可楨

民國十九年六月二十四日

FOREWORD.

The Institute of Meteorology is a part of The National Academy of China (Academia Sinica), which was created during the summer of 1927 by the National Government of China, and was at first known as the Ministry of Education and Research. In the late autumn of the same year, The Ministry of Education and Research was separated into two independent governmental boards; (1) The Ministry of Education, and (2) The National Academy of China.

Hourly observations of meteorological elements, 24 times a day, were made beginning from the first of January, 1928, within the compound of the Ministry. Plan of establishing a new meteorological Observatory at the summit of Pei-Chi-Ko was soon decided upon, and the work on tearing down the old dilapidated Toaiest Temple and founding of a new observatory in its place started in June, 1928. Although the whole building did not finish until the end of December, 1928, the offices were completed first, and were occupied on the first of October; hence during the last quarter of the year 1928 all the meteorological observations were made at the new headquarter.

Previous to the establishment of our Institute, several organizations have kept meteorological records in Nanking at various times. The Japanese Consulate maintained a station from October 1904 to December 1919, with the interruption of two months, i.e. November and December of 1911.

These records have been utilized in the two well-known publications of Zikawei Observatory, viz: "La Temperature en Chine" by Father Gautheir and "La Pluie en Chine" by Father L. Froc. A discussion on the subject of "The Climate of Nanking during the Period of 1905-1921" by Coching Chu, then connected with National Southeastern University of Nanking, was based mainly on these data.

Beginning from October, 1921, The Southeastern University also makes regular daily meteorological observations, at first once a day at 4 p.m., since 1924 twice a day at 9 a. m. and 9 p.m. So far one annual report (1922) and forty-eight numbers of Monthly Weather Bulletins (for the years 1924-'26 and 1928) have been published. With the appearance of the Monthly Meteorological Bulletin of our Institute, the University has discontinued its publication.

To the Freeman Observatory of University of Nanking, however, belongs the honor of being the oldest meteorological station in this city. The latter University started to keep meteorological records in 1895, but unfortunately the observations were not continuous. Since July, 1923, a quarterly publication "Daily Meteorological Records" has been published. The observations were made at 7 a.m. and 7 p.m.

In computing normals for temperatures, pressure and rainfall for Nanking, all three available sources have been utilized, but more weight being given to the data of Japanese Consulate.

The appearance of this volume, the first number of our annual Bulletins, has been unduly delayed, owing to the considerable amount of time consumed in computing the Customs Station data. The present volume consists of two parts:—(1) the mean values of various meteorological elements in Nanking observed during the year 1928, and a discussion therefrom; and (2) the Custom Station records for the same year.

The Nanking data are not quite homogeneous as pointed out before, for the first nine months observations were made in the compound of Ministry of Education and its vicinity at an altitude of 10.5 meters above sea level; while the last quarter of the year the readings were done at the newly constructed Pei-Chi-Ko Observatory, 67.9 meters above sea level and about half kilometer to the north of the former site.

The pressure readings of Nanking have been reduced to the level of Pei-Chi-Ko throughout the whole year in this publication. Many mistakes appeared in the Quarterly Bulletins, have been corrected in the present computation, and hence some of the mean values do not agree with those in the Quarterly. Hourly readings, day and night, were made throughout the year in Nanking, the want of reliable self-recording instruments rendered it necessary for such a proceedure. With the arrival of self-registering instruments from abroad in the later half of the year, the practice of hourly observation throughout the night has been discontinued since January, 1929, only mean monthly and mean annual values are printed in this volume, the hourly readings, having published in the Quarterly Bulletin, are not duplicated here.

The cloudiness observed during the night hours are apt to be lower than what they really are, as pointed out by Father J. de Moidrey of Lu-Kai-Pang Observatory in a private letter. The average amount of cloudiness tabulated in the present volume needs a certain amount of correction for the night hours from 19^h to 5^h.

Mr. P. K. Chang has prepared a paper on "The Relation between Wind and Weather of Nanking during the Year 1928" with sundry tables and charts. It reveals certain facts of great interest, for instance, the southeast monsoon has usually been regarded as the rainfall bearer of the Yangtze Valley in the summer months, but this does not seem to be true to Nanking, at least so far as the surface winds are concerned. The rainfall probability of Nanking with northerly winds far exceeds that with southerly winds in summer as well as in winter (and this holds true for Nanking in the year 1929 also). Northerly and northeasterly winds brought us 34% of the total precipitation in 1928 and 53.5% in 1929, while the corresponding figures for southerly and southeasterly winds for the same years amounted only to 7% and 17% respectively; the increase of percentages both for northerly and southerly winds during the second year owes to the fact that the number of hours with calm has been greatly reduced from 1337 hours in 1928 to 82 hours in 1929 due to the difference of exposure of the wind vane.

There were forty-four Custom Stations the records of which have been embodied in this issue. All the available material has been utilized with the exception of pressure, which were all recorded in inches and not in millimeters, and neither corrected for temperature nor for gravity. The making of proper correction and conversion would entail too much expense of time on our already over-burdened staff, so we have omitted them altogether, at least for the present year.

All the Observers of Customs Stations did their work gratis on cooperative basis. While the records of some stations, especially in connection with the state of weather, such as fog and thunderstorm, are admitedly incomplete, as a whole they have done excellent work. Our hearty thanks are due to these public-spirited Observers as well as to Zi-Ka-Wei Observatory which has done a great deal towards organising the service.

Coching Chu,
Director National Research Institute of Meteorology,
Nanking, China.
June 16, 1930.

民國十七年南京風向與天氣之關係

張寶堃

(一) 緒言· 風向與天氣,有密切之關係,今人固已耳熟矣。陸上之風,每因地勢環境之不同,而不一其趨向。故欲明風向與天氣之關係者,首宜從事於地方風 Local Winds 之研究,誠以茲事範圍較狹,又切實際,於一地方之天氣預報上,亦不無助益也。茲據民國十七年一年中本所之觀測紀錄,爲造統計,藉以觀南京風向與天氣之關係。顧一年之爲期不久,未足引以爲準則,但亦足以資參攷耳。

南京位北緯三十二度五分,東經一百十八度四十七分。東距海岸約三百餘公里;西帶長江,江水環繞城之西北兩面,其闊度約自一公里至二公里。四圍無高山峻嶺,即以其城東最高山紫金山之高度言,亦不過四百四十二公尺。是以各種風向,直達無阻。欽天山位城中東北隅,巍然高聳於山巔者,即今日本所新建之氣象台也。

在氣象台尚未落成之前,本所觀測地點,屢經遷移。自一月一日至九月三十日,凡兩遷,初次自大學院(成賢街十一號)移至附近之成賢街五十六號,繼又遷至中央大學梅庵(南距大學院約五百公尺)。計此三處,均屬平地,離平均海面約一〇·五公尺。自十月一日至年終,均在欽天山新所址觀測,其處高出海平面六七·九公尺。歲經三遷,地易四處,因地位高下環境不同之故,本年度之各項氣象紀錄,實未能完全一致。

本所觀測自民國十七年一月一日起迄十二月三十一日,均每小時一次,晝夜無間,全年觀測回數合計八千七百八十四次。各項氣象紀錄,均見本所氣象季刊。後列十二表十一圖,即根據全年之觀測回數,並將季刊內所有刊誤之處,合行更正。今就本年風向與構成天氣之各項要素之關係,分別述之。

(二) 風向·

本年風向均用目力測定,原爲十六方向,茲因便於比較計,將十六向合併成八方向。全年風向總時數爲八七八四小時,內以東風爲最多,西南風最少。(各風向之時數及其百分數,見第一表及第一圖)·各月中風向時數之最多者,一月爲西北風,二月爲北風,自三月至八月及十,十一兩月之八個月均係東風。九月十二月爲東北風。(見第一表)·

若以東南西北四風向論之,東風南風在夏季(自四月至九月)較在冬季(自十月至三月)爲盛,西風北風則反是。其百分率表如下:

	東風	南風	西風	北風	無風	風向不定	合記
夏季	43.4	15.3	5.7	18.4	17.0	0.2	100.0
冬季	31.8	13.0	11.4	28.6	13.7	1.5	100.0

一年中四種風向之變遷,詳見第二圖。

一日中風向之變更,大致東風之盛行時間,一在自上午八時至十一時,一在自下午四時至子夜。東南風之最多時數,一在上午九時,一在夜間十時。西南風與西風,大半發生在日間溫度高昇之際。東西南風時數之最高點在上午十一時,西風則在下午一時,尤以夏季七八兩月爲最顯著,此或與長江有關係。蓋江水適繞城之西境,日中高溫度時之所以多西風,夜間低溫時之所以多東南風東風(東風時數之最高點,在夜間九時),不管沿海地方夏季日間之多海風,晚中之多陸風也。無風以夜間居多,其時間自夜八時起至翌晨天將拂曉時(見第二表)。

(三) 風向與風力之關係·

此一年中之風力，均按蒲福爾表 Beaufort Scale 用目力測定。以山上與平地位置環境之不同，致使無風時數，在一月至九月間極多（九個月內無風時數總計一二七一小時，平均每月一四一小時，或全月百分之十九）而十月至十二月，驟形減少也（此三個月之無風時數爲六六小時，平均每月僅二二小時，或全月百分之三）。

再細觀自一月至九月之時期中，風力一（蒲福爾表風力一）均佔每月中之最多數（其總時數爲二五七二小時，平均每月二八六小時，或全月百分之三九）而十月至十二月，則以風力二，爲各月中之首多數（三個月中風力二之總時數爲六八八小時，平均每月二二九小時，或全月百分之三一）。山上風力與平地風力大小之不同，於此可見。

以全年之平均風力言，北風最強，南風最弱，東風較西風強。冬季十月至十二月北風風力漸增，南風勢力日削。夏季七八兩月，因雷雨關係，西風最猛。同時東風北風則自六月至八月而日見衰微。（見第三表及第三圖）。

八月中之風力，竟無一小時在蒲福爾表風力五以上者，僅有一小時之西風，風力爲五。無風與風力一，合計達四五六小時，佔全月百分之六十一，故以風力論，此乃本歲最平靜之一月也。

至於各月中風力之最大者，厥推九月。統計全年大風（風力八以上）共六十五小時，內九月獨佔十九小時，或總數百分之二十九，尤以十五日之風爲最猛烈，其時值一颱風經過南京附近，風力九之東風，繼續至三小時之久。大風之方向，多半來自北，東北及東者，第四表及第四圖，即表示有五十六小時或百分之八十六之大風，均發生在東北一象限內，而自南及西南之兩方面，大風絕跡。

（四） 風向，雨量，雨時及降雨可能性之關係。

本年降雨時數，總計九百三十五小時，佔全年總時數百分之一〇・六，約平均每二十一小時中有二小時降雨。雨量總計八七〇・五公厘，居南京二十四年雨量紀錄中之最少第六位。

各月雨量與雨時最多之風向，在二，三，四，六，十二，五個月，皆爲北風。八九兩個月爲東北風。七，十一兩月爲東風。五月雨時以北風爲首多，而雨量則集中在西北風（因雷雨關係）。十月雨時有十八小時，而雨量僅一公厘，是爲本年內雨量最少之一月，亦爲南京二十四年來十月份有雨紀錄中之最少者（惟民國二年十月份無雨）。

南風西南風雨量最少。當東南季風盛行之時，南風略帶有雨澤耳。無風時之雨量佔全年總量百分之三三・〇，爲本歲各風向冠，特其雨時不及北風，東北風，東風之多。（見第五表第六表及第五第六圖）。

雨量雨時，略如上述。各風向降雨之可能性，卽根據降雨時數與其相關之風向時數求得之。觀第七表，可知北風，東北風東風之降雨可能性最大；而南風東南風西南風之降雨可能性極小。諺語所謂『東北風，雨太公』者，信然。表中西風之降雨可能性亦有一七・二%僅次於北風而超乎東北風東風者，豈意料之所及乎。致西風全年總時數爲五四七小時，其降雨時數爲七七小時，坐是之故，頓使其降雨可能性增高。若就各風向每一雨時之平均雨量論，則東北風爲〇・八六公厘，東風爲〇・七八公厘，西風僅〇・四五公厘，誠未可相提並論也。（見第五第六表）。

（五） 風向與溫度之關係。

常人以爲東南風溫暖，西北風寒冷，試觀本歲統計之結果，益足證實。第八表各月之最高溫度，一，九，十一月均爲東南風。二，七，八，三個月爲西南風。三，四，十二月爲南風。以全年言，南風最熱，西北風最冷，其相差爲攝氏九・六度。

西南風來自酷熱地方，如安南印度等地，其性極暖。當夏季西南風時，人常感覺悶熱者，卽因該

風來自西南濕熱之地，而又多值日間陽光直射之時也。本年二月中之絕對最高溫度達二十五度三（二月二十九日），爲南京二十四年來之新紀錄，查彼時風向爲西南，斯益證西南風之酷熱性矣。

東風源自海洋，能使冬溫增高，夏溫低減。普通住屋每以東向或南向，備極人所歡迎者以此。風向轉移與溫度變遷之情形詳見第八表及第八圖。

(六) 風向與濕度之關係·

通常氣溫最低之時，相對濕度多係最高，蓋溫度漸降之際，空氣中之絕對濕度，雖同時亦漸減，特其遞減之速率，不及溫度，結果則相對濕度，反因以增高，往往達飽和點而結露凝霜。

本年南京之平均溫度，既以西北風爲最低，則最大相對濕度之屬西北風，正合理論。西南風天氣酷熱，相對濕度因是最小。若以絕對濕度而論，則西北風固係最乾燥，而全年平均溫度最高之南風確是極潮濕。

各月中風向與濕度之變遷，見第九表及第九圖。

(七) 風向與雲量之關係.

雲量與風向之關係與相對濕度與風向之關係相類似。一年中之平均雲量，最多時爲西北風，最少時爲東南風西南風。（見第十表及第十圖）。

無風之際，大率無雲。本年無雲時數，總計 2221 小時，內無風佔 468 小時，卽百分之二十一。全年無風時數爲1337小時，可知一百小時之無風中，有三十五小時無雲。無風多半發生在夜間及黎明時，適值一日中溫度最低之期間，其時對流作用幾已完全停止，而空氣有下趨之勢，故雲霧無由而生，此無風時之所以多無雲也。

再以天氣陰晴之百分數觀之，則晴天之百分數最大者，爲西南風；無風，東南風南風次之；最小者爲西北風。陰天百分數之最大者爲西北風，次西風，又次爲北風東北風，而以東南風爲最小。各風向最天之百分數，無大差異。（見第十一表及第十一圖）。換言之，有風多佳日，北風多陰天。

(八) 結語·

總觀上述南京一年來風向與天氣之關係，可知北風風力強，天氣冷，相對濕度大，雲量多，殆可謂構成陰雨天氣之原素。南來之風則類皆風和日暖（卽風力小，溫度高）天朗氣爽（卽雲少，相對濕度小）而降雨之機會極鮮。東風冬暖夏涼；西風非雨卽陰。

The Relation between Wind Direction and Weather of Nanking during the Year 1928.

By P. K. Chang.

1. Introduction.—The relation between wind and weather has in recent years been the subject of considerable discussion. It is true, apparently, that "every wind has its weather" and a complete local climatology should give careful consideration to the influences on the weather associated with the various wind directions. In order to understand the said relation of Nanking, several statistics are thus made, based on 1-year record of hourly observations at our Institute during the year 1928. Though one year cannot be regarded as sufficient to indicate the true conditions, but no doubt it will be of a little help to the study of weather of Nanking or for local weather forecasting.

Nanking is situated on latitude 32° 05′ N., longitude 118° 47′ E., about 300 kilometers from the sea coast to the east. Around its western and northern outskirts flows the Yangtze River which varies here from one to two kilometers in width. There are several ranges of hills to the north, east and south of Nanking, varying in distance from center of city from five to twenty kilometers or more, the average height of these ridges do not exceed 250 meters. Even the highest range, known as Purple Mountains, has its crest with a height of only 442 meters above the ground. Hence winds from any direction can pass through the city without any obstruction. Within the city there are several hillocks, the highest being Pei-Chi-Ko situated at northeastern part of the city.

Before the new observatory building at Pei-Chi-Ko was ready for occupation, the station was located at the ground level within the city. From January 1, to September 30, 1928, the station was moved twice. First from the Ministry of Education & Research to 56 Cheng Hsien Street just across the road, and then to the Central University about 500 meters further to the north. All of these three places are on level ground and about 10.5 meters above sea level. From October 1st. to the end of the year, observations were made at the new headquarter located at the summit of Pei-Chi-Ko Hill, 67.9 meters above the mean sea level. Hence the data for the year is not homogeneous.

Eye observations were made hourly 24 times a day on wind direction, velocity, temperature, pressure, etc. There are, therefore, altogether 8,784 observations of each element during the year. These readings have been published in he Quarterly Meteorological Bulletins for the year 1928, many misprints and errors occurred in the Quarterly, especially in the first number for the period January-March, 1928, which have been corrected during the present computation.

2. Total Duration of Wind Directions.—Originally the wind was recorded in sixteen directions, in the present computation only eight principal directions were used, readings of the remaining eight directions were equally divided between their near neighbors; in case of odd number, the extra one was given over to that neighboring direction which occurred more frequently. From Table 1 we find that the east wind was the most prevalent, taken the year as a whole, while the southwest was the direction of least frequency. The east winds were prevailing during the months from March to August, and October and November, they had a well marked maximum during the month of August, with 314 hours or 44.2 per cent of the total monthly number. In January, the prevalent wind was from northwest; in February, from north; and in September and December from northeast. The winds of February were comparatively the most unsteady.

If we consider only the four cardinal points of the compass, it will be seen that the total frequency in percentages of easterly and southerly winds in the summer months, from April to September, was greater than in the winter months, from October to March; and

those of the northerly and westerly winds, vice versa. Their frequencies in percentages are shown as follows:

	E'ly	S'ly	W'ly	N'ly	Calms	Var.	Total
Summer	43.4	15.3	5.7	18.4	17.0	0.2	100.0
Winter	31.8	13.0	11.4	28.6	13.7	1.5	100.0

The most prevailing direction, east, is found to have a staedy increase from 4 o'clock a.m. to 9 a.m., and then decreases slightly, after 4 p.m. it increases again until midnight. The southeast wind reaches a maximum also at about 9 a.m., and again at 10 p.m., having its minimum at 5 p.m. Evidently, in summer time the winds blowing from the west attain their maximum in the noontime, about the time the east or southeast wind reaches their secondary minimum. This is probably due to the influence of the Yangtze River. Calms occurred usually in the night until the time just before sunrise. (See Table 2.)

3. Wind Direction and Wind Force.—The force of surface winds recorded this year was by eye observation in Beaufort scale. During the last quarter of the year, the observations were done at Pei-Chi-Ko hill, hence the records of wind force during this period are not strictly comparable to those of the preceding months. Northerly winds are much stronger during the winter months, they increase in strength from October to December, while the strength of southerly winds decrease during the same period. During the summer months in July and August, west wind is the strongest, due to the influence of thunderstorms, while east and north winds gradually diminish in strength from June to August.

Generally speaking, the northerly winds are the most forceful winds; southerlies the weakest; while easterlies are comparatively stronger than the westerly winds. (See Table 3 and Fig. 3.)

August was a month of quiet weather, there was no wind with strength over 5 of Beaufort scale, and only one hour with force 5 occurred when wind is from the west.

Calms occurred most frequently during the first three quarters of the year and only few hours in the last quarter because of change of location from ground level up to the summit of Pei-Chi-Ko hill.

Winds of strength 1 predominated all others except in October, November and December. In the latter three months, winds with force 2 were prevailing instead of winds with force 1. This is also due to the fact that observations were taken at different localities as stated above.

The month of the greatest wind force was September. The number of hours with gales during the year amounted to 65, and of these 19 hours or 29 per cent happened in September. The big share of gales in September was owing to a typhoon passing near Nanking on 15th, when the highest force recorded was 9, continued for three hours from the east. Of the total hours with gales, 56 hours or 86 per cent occurred in the northeastern quadrant. And the quarter from south to southwest was without even a single gale. (See Table 4 and Fig. 4.)

4. Wind Direction, Amount of Rainfall and Probability of Precipitation.—The total rainfall of this year amounted to 870.5 mm., of this amount 433.4 or 49.8 per cent fell with northeast, north or east winds, and 33.0 per cent with calm.

In February, March, April, June and December, the rainfall occurred mostly with north wind. The greater part of rainfall in August and September fell during the time when the wind was from northeast. In July, the rainiest month, and in November, precipitation came with the east wind. October was a month of little rainfall, the total amount being 1 mm. and the number of hours with rain, 18.

The south and southwest winds bring little rainfall. During the southeast monsoon season, very little rain obtained from the south wind. Above all, calms favored rain especially during the first nine months when our station was not well exposed.

In general, the southerly winds rarely yielded us any rainfall in this whole year; while the northerly winds, especially the northeast, are preeminently the rain-bearing winds of Nanking. The fact that north, northeast and east winds are the rainy winds of Nanking, can best be shown in the table of probabilities of precipitation. In Table 7 it is seen that the probability of rain with west wind was so great (17.2 per cent), that it ranks only next to north. It is interesting to note, however, the west winds blew for 547 hours, or 6.2 per cent of the whole year, of which there were 77 hours with rain, amounting altogether only to 26.7 mm. The precipitation is more intensive with north or northeast than with west or northwest winds. The average amount of precipitation per rainy hour is 0.86 mm. for northeast wind, 0.78 mm. for east, 0.76 mm. for north, 0.68 mm. for northwest, but only 0.45 mm. for west winds.

5. Wind Direction and Temperature.—The most obvious influence of wind direction on weather elements is on the temperature. As every one knows, that temperature changes accompany a change in wind direction. It may be anticipated also, the easterly winds from the ocean should cause a marked lowering of the temperature in summer, but a noticeable rising in winter. And the southwest wind from the warmest land, as India, etc., causes a rising of the temperature. For instance, in February, 1928, the absolute maximum temperature 25.3°C. happened on 29th with southwest wind, this is the highest temperature on record in February in Nanking since 1905. The highest temperature in January, September and November occurred in connection with southeast wind; in February, July and August, with southwest; in March, April and December, with south wind.

Taken the year as a whole, south wind has the highest temperature with 19.6°C. and northwest, the lowest temperature with 10.0°C.

It is worth noting in Table 8 and Fig. 8 that the temperature is found falling gradually with veering of the wind direction from south through SE to north and from south through SW to northwest.

6. Wind Direction and Humidity.—The relative humidity of the air in its relation to wind direction is exceedingly important at least from the physiological point of view. In winter when the wind is from the northwest people feel rather colder than warranted by the temperature. Tables 8 and 9 show that northwest wind has the highest mean annual relative humidity but the lowest mean annual temperature. Because the high relative humidity of the air causes a high conductivity of heat from the body, therefore it makes a man feel much colder in winter when wind is from northwest. Table 9 also shows that the southwest wind has the lowest mean annual relative humidity. The range in relative humidity between NW and SW winds was 13.3 per cent.

As to the absolute humidity it is well-nigh opposite to the relative humidity. The highest mean annual absolute humidity occurred with the south wind, and the lowest mean annual with the northwest, the difference being 4.2 mm. (See Table 9 and Fig. 9.)

7. Wind Direction and Cloudiness.—The relation between wind direction and cloudiness is nearly similar to that between wind direction and relative humidity. The highest mean annual cloudiness occurred when the wind is from the northwest, and the lowest mean annual with southeast and southwest wind. (See Table 10 and Fig. 10.)

Roughly speaking, calm weather means clear weather, because most of the cloudless hours were experienced during calms or when the wind lulls in the night.

It is shown in Table 11 and Fig. 11 that southwest, southeast and south winds have the greatest percentages of clear weather while the northwest is generally accompanied by a