

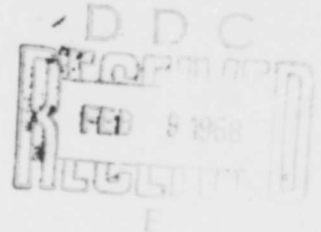
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U. S. DEPARTMENT OF COMMERCE  
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Weather Bureau

AN ANNOTATED BIBLIOGRAPHY ON THE CLIMATE  
OF NORTH VIETNAM

By  
Annie E. Grimes  
Foreign Section  
Office of Climatology



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Washington, D. C.  
July 1965

93

BIBLIOGRAPHY ON THE CLIMATE OF:

1955

- WB/BC-1 \*Brit. East Africa (also #7)  
 WB/BC-2 \*Cabinda  
 WB/BC-3 \*Cameroons  
 WB/BC-4 \*French Equatorial Africa  
 WB/BC-5 \*Peru  
 WB/BC-6 \*Rio Muni & Gulf of Guinea Is.  
 WB/BC-7 \*Brit. East Africa II (also #1)

1956

- WB/BC-8 \*Angola  
 WB/BC-9 \*Antarctica  
 WB/BC-10 \*Arctic  
 WB/BC-11 \*Belgian Congo  
 WB/BC-12 \*Chile (also #23)  
 WB/BC-13 \*Colombia  
 WB/BC-14 \*Costa Rica  
 WB/BC-15 \*Ecuador (also #24)  
 WB/BC-16 \*Guatemala  
 WB/BC-17 \*Honduras  
 WB/BC-18 \*New Zealand (Revised by #77)  
 WB/BC-19 \*Federation of Rhodesia & Nyasaland  
 WB/BC-20 \*Panama (Revised by #75)  
 WB/BC-21 \*Salvador  
 WB/BC-22 \*Venezuela (also #27)  
 WB/BC-23 \*Chile II (also #12)  
 WB/BC-24 \*Ecuador II (also #15)  
 WB/BC-25 \*New Zealand II (Revised by #77)  
 WB/BC-26 \*Panama II (Revised by #75)  
 WB/BC-27 \*Venezuela II (also #22)

1957

- WB/BC-28 \*Greenland (also #40)  
 WB/BC-29 \*Guianas (Brit., French, Dutch)  
 WB/BC-30 \*Indochina (also #38) to be revised  
 WB/BC-31 \*Iran (not on MF)  
 WB/BC-32 \*Iraq (also #35) not on MF  
 WB/BC-33 \*Turkey (also #34) not on MF  
 WB/BC-34 \*Turkey II (also #33) not on MF  
 WB/BC-35 \*Iraq Suppl. (also #32) not on MF

1958

- WB/BC-36 \*Cuba (not on MF)  
 WB/BC-37 Cyprus  
 WB/BC-38 \*Indochina II (also #30) Not on MF  
 WB/BC-39 Malta and Gibraltar  
 WB/BC-40 \*Greenland Suppl. (not on MF)  
 WB/BC-41 \*Germany 1950-1957 (also #69) not on MF

1960

- WB/BC-42 Arabian Peninsula  
 WB/BC-43 Caucasus  
 WB/BC-44 \*Australia (not on MF)  
 WB/BC-45 Greece  
 WB/BC-46 Norway  
 WB/BC-47 South Pacific Islands

1961

- WB/BC-48 Brit. Honduras (Rev. by #52)  
 WB/BC-49 Jordan  
 WB/BC-50 Lebanon  
 WB/BC-51 So. Indian Ocean Is. (Rev. by #70)

1962

- WB/BC-52 Brit. Honduras (Revised)  
 WB/BC-53 Luxembourg  
 WB/BC-54 China (Formosa)  
 WB/BC-55 Macao  
 WB/BC-56 Hong Kong  
 WB/BC-57 Israel  
 WB/BC-58 Azores  
 WB/BC-59 Iceland  
 WB/BC-60 Madeira  
 WB/BC-61 Cape Verde Is.  
 WB/BC-62 The Dominican Republic  
 WB/BC-63 Nicaragua  
 WB/BC-64 British Borneo...  
 WB/BC-65 Portugal

1963

- WB/BC-66 Albania  
 WB/BC-67 Andorra  
 WB/BC-68 Canary Islands  
 WB/BC-69 East Germany (see also #41)  
 WB/BC-70 Indian Ocean Islands (Revised)  
 WB/BC-71 Sinkiang (China)  
 WB/BC-72 Balearic Islands  
 WB/BC-73 Réunion Island  
 WB/BC-74 Bolivia  
 WB/BC-75 Panama and Canal Zone (Rev.)  
 WB/BC-76 Spain

1964

- WB/BC-77 New Zealand (Revised)  
 WB/BC-78 Hungary  
 WB/BC-79 French West Indies  
 WB/BC-80 Sudan  
 WB/BC-81 Denmark and Faeroe Islands

1965

- WB/BC-82 Tibetan Highlands  
 WB/BC-83 Northeast China  
 WB/BC-84 North China  
 WB/BC-85 Korea  
 WB/BC-86 Macao (Revised)  
 WB/BC-87 South China  
 WB/BC-88 North Vietnam

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AN ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF  
NORTH VIETNAM

Annie E. Grimes

Weather Bureau  
Washington, D.C.

July 1965

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**INTRODUCTION**

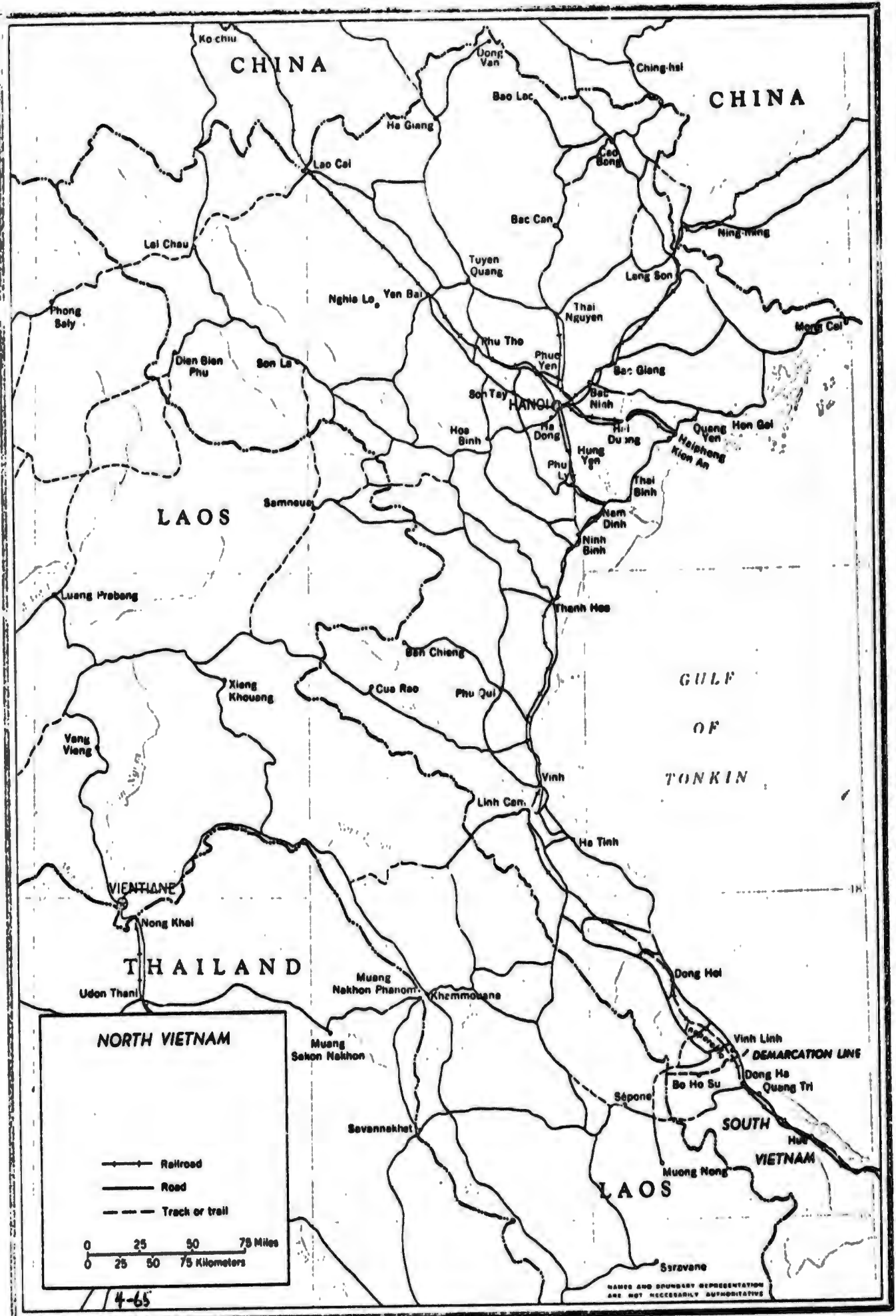
This bibliography on the climate of North Vietnam has been compiled from sources in various libraries of the Washington Metropolitan Area. Some sources may be in more than one of these libraries, however the call number is recorded in the abstract for only one of them in the preferential order listed below:

DWB	U. S. Weather Bureau Library
DLC	Library of Congress
DNAL	National Agriculture Library
DN-HO	U. S. Naval Oceanographic Library
D-BC	U. S. Bureau of Census

For example, a source listed in the National Agriculture Library was not located at the time of search in the Weather Bureau Library or Library of Congress but it may also be in the U. S. Oceanographic Library and/or the U. S. Bureau of Census, which are lower on the preferential list.

The initials MAB appearing at the end of the abstract of source no. 110 indicate that this abstract has been taken from the "Meteorological Abstracts and Bibliography" (in 1960 title changed to "Meteorological and Geostrophysical Abstracts") of the American Meteorological Society.

Translations of foreign titles to English are recorded.



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LIST OF CLIMATOLOGICAL STATIONS  
IN NORTH VIETNAM

	<u>Latitude</u>	<u>Longitude</u>		<u>Latitude</u>	<u>Longitude</u>
An-chau	21°20'N	106°51'E	Dien-bien-phu	21°19'N	103°01'E
Bachmai	21°00'N	105°50'E	Dinh-lap	21°33'N	107°06'E
Bac-kan	22°00'N	106°00'E	Do-luong	18°54'N	105°18'E
Bac-kau	22°33'N	102°22'E	Dong-bai	20°49'N	106°52'E
Bac-lé	21°31'N	106°25'E	Dong Hoi	17°29'N	106°36'E
Bac-mè	22°24'N	105°32'E	Dong-van	23°17'N	105°22'E
Bac-muc	22°04'N	105°06'E	Do-son		
Bac-ninh	21°10'N	106°05'E	Do-trai	18°34'N	105°39'E
Bac-quang	22°29'N	104°51'E	Dudo	19°24'N	105°47'E
Bai-thuong	19°54'N	105°22'E	Gia-hoi	18°16'N	106°00'E
Ban-yen-nhan	20°56'N	106°01'E	Gia-lam	21°03'N	105°42'E
Bao Ha	22°12'N	104°21'E	Gowtow	21°01'N	107°50'E
Bao-lac	22°57'N	105°40'E			
Baxat	22°36'N	103°51'E	Ha-coi	21°26'N	107°46'E
Benthuy	18°39'N	105°42'E	Ha-dong	20°58'N	105°46'E
Bim-son	20°05'N	105°52'E	Ha-giang	22°50'N	104°58'E
Binh quang	20°52'N	106°11'E	Hai-duong	21°00'N	106°25'E
			Haiphong	20°52'N	106°41'E
Cac-ba	20°50'N	107°00'E	Hanoi	21°01'N	105°51'E
Cam-hoang	20°06'N	105°33'E	Hatinh	18°21'N	105°54'E
Campha			Hatou	20°58'N	107°09'E
Campha-Mines	21°01'N	107°16'E	Hoa-Binh	20°48'N	105°20'E
Campha-Port	21°01'N	107°22'E	Hoa-duc	18°15'N	106°09'E
Cam-Trang	18°28'N	105°23'E	Hoalac	21°02'N	105°30'E
Can-loc	18°27'N	105°47'E	Hoang-su-phi	22°45'N	104°41'E
Caobang	22°40'N	106°15'E	Ho-do	18°24'N	105°53'E
Cao-trai	19°22'N	105°24'E	Hoi-xuan	20°22'N	105°07'E
Cat-mong	19°18'N	105°21'E	Hongay	20°57'N	107°05'E
Gaugie	20°42'N	105°54'E	Huang-su-phi	22°44'N	104°40'E
Cau-son	21°26'N	106°20'E	Hung-hoa	21°15'N	105°17'E
Chapa	22°21'N	103°50'E	Hung-yen	20°39'N	106°03'E
Cho-bo	20°43'N	105°10'E			
Cho-chu	21°54'N	105°37'E	Kébao	21°08'N	107°31'E
Cho-don	22°11'N	105°37'E	Kebon	19°37'N	105°01'E
Cho-moi	21°54'N	105°48'E	Kego	18°12'N	105°56'E
Cho-ra	22°27'N	105°42'E	Khe-ao-co	18°15'N	106°10'E
Chu	21°22'N	106°33'E	Khe-ao-dau	18°14'N	106°08'E
Chu-lé	18°13'N	105°40'E	Khe-khuong	18°57'N	105°16'E
Co-dang			Khoai-chau	20°51'N	105°58'E
Cua-lô			Kim-cuong		
Cua-rao	19°17'N	104°25'E	Ky-anh	18°05'N	106°18'E
Cuatung	17°01'N	107°06'E			
			Lach-truong	19°53'N	105°57'E
Da-chong	21°07'N	105°19'E	Lai-chau	22°00'N	103°00'E
Dai-dong	20°27'N	105°48'E	Lam	21°21'N	106°31'E
Dai nam	19°50'N	105°42'E	Langhit	21°45'N	105°50'E
Daphuc	21°15'N	105°51'E	Lang-Son	22°00'N	106°30'E
Diem-dien	20°33'N	106°34'E	Lao Kay	22°30'N	103°57'E

LIST OF CLIMATOLOGICAL STATIONS  
IN NORTH VIETNAM  
(continued)

	<u>Latitude</u>	<u>Longitude</u>		<u>Latitude</u>	<u>Longitude</u>
La Pho	21°10'N	105°16'E	Phong-tho	22°32'N	103°21'E
La-trong	17°53'N	105°48'E	Phong-y	21°13'N	105°28'E
Lethuy	17°13'N	106°47'E	Phuc-dia	20°00'N	105°29'E
Lien-mac	21°05'N	105°45'E	Phuc-trach		
Lien-son	21°26'N	105°31'E	Phucu	20°42'N	106°15'E
Linh-Cam	18°32'N	105°34'E	Phuc-yen	21°14'N	105°42'E
Loc-binh	21°46'N	106°56'E	Phu-dien	18°59'N	105°36'E
Long-thai	18°52'N	105°23'E	Phu-doan	21°39'N	105°11'E
Luc-nam	21°18'N	106°24'E	Phu-ho	21°27'N	105°14'E
Lu-van	21°23'N	106°03'E	Phu-lang-thuong	21°16'N	106°11'E
			Phu Lien	20°49'N	106°38'E
Mao-khé	21°05'N	106°34'E	Fhu-ly	20°33'N	105°54'E
Mauson	21°51'N	106°54'E	Phu-man	20°58'N	105°31'E
Mine Clotilde	21°07'N	106°50'E	Phu-nghia	19°07'N	105°42'E
Moc-Chau	20°51'N	104°37'E	Phu-nho-quan	20°19'N	105°45'E
Mo-chen	21°05'N	105°24'E	Phuqui	19°19'N	105°25'E
Mon cay	21°32'N	107°58'E	Phu-thy		
Mong-duong	21°03'N	107°20'E	Phuxuyen	20°46'N	105°54'E
Mui-ngoc	21°26'N	107°58'E	Phu-yen	19°16'N	105°22'E
Muong Boum	22°28'N	102°56'E	Phu-yen-binh		
Muong-khuong	22°46'N	104°07'E	Pont du Day	21°05'N	105°58'E
Muong Nhie	22°11'N	102°27'E	Port-Wallut	21°12'N	107°33'E
Muong-sen	19°24'N	104°08'E			
Muong Te	22°29'N	102°36'E	Quang-khé	17°42'N	106°29'E
My-khé	21°06'N	105°24'E	Quang-yen	20°57'N	106°49'E
Na-cham	22°03'N	106°36'E	Rao-buoi	18°06'N	106°00'E
Na-don	22°11'N	105°19'E	Roon	17°53'N	106°27'E
Namdinh	20°25'N	106°10'E			
Naphay			Samson		
Nganson	22°26'N	105°59'E	Sept-Pagodes	21°07'N	106°18'E
Nghia-lo	21°36'N	104°30'E	Song-Tri	18°03'N	106°17'E
Nghia-thuong	21°19'N	106°06'E	Son-La	21°20'N	104°00'E
Ngoc-giap	19°37'N	105°47'E	Sontay	21°09'N	105°30'E
Nhu-xuan	19°26'N	105°47'E			
Ninh-binh	20°15'N	105°58'E	Tamdao	21°28'N	105°38'E
Ninh-giang	20°44'N	106°24'E	Thai-binh	20°27'N	106°20'E
Norways	20°37'N	107°09'E	Thai-nguyen	21°40'N	106°00'E
			Thanh-ba	21°28'N	105°08'E
Pa-kha	22°32'N	104°17'E	Thanh-Hoa	12°48'N	105°46'E
Phan-mê	21°42'N	105°43'E	Thanh-Qua		
Phan-son-nui	21°14'N	106°12'E	Thanh-son	19°03'N	105°40'E
Phat-diem	20°05'N	106°05'E	Than-moi	21°37'N	106°33'E
Pho-ba-ché	21°16'N	107°16'E	Than-uyen	21°56'N	103°54'E
Pho-binh-gia	21°58'N	106°22'E	That-khé	22°16'N	106°28'E
Pho-chau	18°30'N	105°36'E	Thinh-thinh	18°12'N	105°53'E
Pho-moi	22°29'N	103°58'E	Tho-hac	19°49'N	105°45'E

LIST OF CLIMATOLOGICAL STATIONS  
IN NORTH VIETNAM  
 (continued)

	<u>Latitude</u>	<u>Longitude</u>
Tho-khê	21°12'N	105°57'E
Thoung-xa	18°50'N	105°41'E
Thuan-chau	21°26'N	103°41'E
Tien-tri	18°16'N	106°07'E
Tienyen	21°20'N	107°25'E
Tong	21°09'N	105°30'E
Trungkhanhphu	22°50'N	106°31'E
Trung-luong	18°33'N	105°40'E
Tsin-Ho	22°19'N	103°14'E
Tu-dung	18°12'N	106°08'E
Tuyen-quang	21°49'N	105°12'E
Uong-by	21°02'N	106°46'E
Van-bu	21°22'N	101°50'E
Van-du	20°08'N	105°43'E
Van-ly	20°07'N	106°18'E
Van-phan	19°02'N	105°36'E
Van-yen	21°05'N	104°42'E
Viêtri	21°18'N	105°26'E
Vinh	18°40'N	105°40'E
Vinh-tuy	22°16'N	104°53'E
Vinh-yen	21°18'N	105°36'E
Voibo	18°28'N	105°19'E
Vu-ban	20°27'N	105°27'E
Xuan-thuy	20°53'N	105°34'E
Yên-bay	21°42'N	104°52'E
Yen-lac	22°14'N	106°11'E
Yên-minh	23°08'N	105°07'E
Yên-my	19°30'N	105°39'E
Yen-trach	18°52'N	105°22'E
Yên-vinh	18°40'N	105°39'E

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AN ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF  
NORTH VIETNAM

1884 - 1890

1884

1. Ueber das Klima von Tonkin (On the climate of Tonkin). Zeitschrift der Osterreichischen Gesellschaft für Meteorologie 19:189,190. (In German). Wien, 1884. DWB M(05) 029z.

...Discusses briefly the climate of Tonkin and presents tabular monthly and annual summaries of temperature and rainfall for Hanoi. These summaries include the following: mean temperature and mean temperatures at specified hours based on data for the period September 1877-April 1879; mean total rainfall amount and mean number of rainy days for 1878.

1885

2. Bouinai, A. and Paulus, A. Indo-Chine française contemporaine (Modern French Indochina). Vol.II. 2nd edition. (In French). Paris, 1885. DLC DS534 .B76.

...On pages 467-477 contains notes on the climate of Tonkin and presents monthly, seasonal and annual summaries of mean temperature and total rainfall amount (mm.) for Haiphong and Hanoi and compares these values with those of Saigon.

1886

3. Supan, - Bouinai et Paulus: L'Indo-Chine française contemporaine (Bouinai and Paulus: Contemporary French Indochina). Meteorologische Zeitschrift 3:143. (In German). Berlin, 1886. DWB M(05) M589z.

...Presents monthly and annual mean temperature and mean total rainfall amount based on data for an unspecified period at Haiphong and Hanoi and seasonal (October-March, April-September) wind direction (8 points) frequency in % at Hanoi based on data for an unspecified period.

1891 - 1900

1898

4. Counillon, M. Note sur le typhon du mois d' octobre 1897 en Annam et au Tonkin (Note on the typhoon in October 1897 in Annam and in Tonkin). Bulletin Économique de l'Indochine 1 (1):25-34. (In French). Saigon, July 1898. DLC HC441 .A4.

...Describes the principal documents on the typhoon of October 12-16 for Annam and Tonkin and evaluates each; discusses the pressure, change in speed, wind direction and force, rain and damages; presents tabular observed pressure at 0730, 1400 and 2100 for October 13-16 at Hanoi. Additional pressure data are presented for stations in Annam which is now South Vietnam.

5. Le Lay, G. Climatologie comparée des stations principales de Saigon (Cochinchine), Pnom-Penh (Cambodge), Tourane (Annam), Hanoi (Tonkin) et Langsa (Lang-Bian), pendant le 1<sup>er</sup> trimestre 1900 (Comparative climatology of the principal stations of Saigon (Cochinchina), Pnom-Penh (Cambodia), Tourane (Annam), Hanoi (Tonkin) and Langsa (Lang-Bian), during the first quarter of 1900). Bulletin Économique de l'Indo-Chine 3(26):431,432. (In French). Saigon, 1900. DLC HC441 .A4.

...Is a table presenting absolute extreme temperatures with range, extreme daily ranges of temperature and mean extreme temperatures for Saigon, Pnompenh, Tourane, Hanoi and Langsa for each month (January-March) in 1900.

6. Le Lay, G. Climatologie comparée des stations principales de Saigon (Cochinchine), Pnom-Penh (Cambodge), Tourane (Annam), Hanoi (Tonkin) et Langsa (Lang-Bian), pendant le 3<sup>e</sup> trimestre 1900 (Comparative climatology of the principal stations of Saigon (Cochinchina), Pnom-Penh (Cambodia), Tourane (Annam), Hanoi (Tonkin) and Langsa (Lang-Bian), during the 3rd quarter of 1900.) Bulletin Économique de l'Indo-Chine 3(30):743, 744. (In French). Saigon, December 1900. DLC HC441 .A4.

...Compares the monthly (July-September) values in 1900 of absolute extreme temperatures, temperature ranges, mean extreme temperatures, mean temperature, mean relative humidity and total rainfall at Langsa with Saigon, Pnompenh, Tourane and Hanoi.

7. Le Lay, G. Climatologie de Hanoi (Tonkin) (Climatology of Hanoi, Tonkin). Bulletin Économique de l'Indo-Chine 3(29):655-660. (In French). Saigon, November 1900. DLC HC441 .A4.

...Records monthly and annual summaries for 1899 at Hanoi of absolute extreme temperatures with dates, temperature ranges, mean extreme temperatures, mean temperature, absolute extreme pressures with range, mean pressure at specified hours (0700, 1400 and 1900), mean relative humidity, wind direction frequency, total rainfall amount and total number of days with rain.

8. Le Lay, G. Note sur la climatologie de Pak-Hoi (Note on the climatology of Pak-Hoi). Bulletin Économique de l'Indo-Chine 3(26):424-430. (In French). Saigon, 1900. DLC HC441 .A4.

...Includes tabular comparative monthly and annual mean and extreme temperatures, extreme pressures and total rainfall amount (mm.) for Hanoi and Pakhoi during 1899.

9. Le Lay, G. Résumé des observations relevées dans les stations météorologiques principales de l'Indo-Chine pendant l'année 1899. (Summary of observations taken at principal meteorological stations in Indochina in 1899). Bulletin Économique de l'Indo-Chine 3(25):380-382. (In French). Saigon, 1900. DLC HC441 .A4.

...Present tables with monthly extreme temperatures with dates of occurrence, mean extreme temperatures, mean temperature, total rainfall amount and mean relative humidity for 8 stations in Indochina in 1899. Two of these stations (Langsa and Hanoi) are in North Vietnam.

10. Le Lay, G. Résumé des observations relevées dans les stations météorologiques secondaires de l'Indo-Chine pendant l'année 1899 (Summary of observations taken at secondary meteorological stations in Indo-China during 1899). Bulletin Économique de l'Indo-Chine 3(25):383-388. (In French). Saigon, 1900. DLC HC441 .A4.

...Consists of tables with monthly and annual absolute and mean extreme temperatures, mean temperature and total rainfall amount for Vinh, Thanh-Hoá, Quang-yên, Hongay, Moncay, Langson, Caobang, Laokay, Hagiang and Backan in North Vietnam in 1899.

1901 - 1910

1902

11. Beljonne, A. Répartition des pluies en Indo-Chine (Distribution of rains in Indochina). Bulletin Économique 5: 294-300. (In French). Hanoi, 1902. DLC HC441 .A4.

...Consists of rainfall data for individual stations in North Vietnam, South Vietnam, and Laos. These data include annual total and extreme amounts of rainfall for Hanoi, Quang-yên, Lao-kay, Hagiang, Cao-bang, Lang-son, Than-hoa and Vinh for varying periods during 1886-1900; monthly and annual total rainfall amount for each year and over the period 1886-1900 for Hanoi.

12. Le Lay, G. Climatologie de Hanoi (Climatology of Hanoi). Bulletin Économique 5:663-669. (In French). Hanoi, 1902. DLC HC441 .A4.

...Consists of climatic monthly summaries for each year (1899-1901) at Hanoi. These summaries include absolute extreme temperatures, temperature ranges, mean extreme temperatures, mean temperature, absolute extreme relative humidities, mean relative humidity at 1000 and 1600, mean pressure, absolute extreme pressures, mean cloud amount at 1000 and 1600, wind direction frequency, total amount of rainfall and total days with rainfall.

1903

13. Le Lay, G. Climatologie de Haiphong (Année 1902)(Climatologie of Haiphong in 1902). Bulletin Économique 6:502-507. (In French). Hanoi, 1903. DLC HC441 .A4.

...Lists the meteorological instruments at Haiphong and presents monthly summaries at this station for 1902 of absolute extreme temperatures, temperature range, mean extreme temperatures, mean temperature, mean relative humidity at 1000 and 1600, absolute extreme pressures, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rain, total number of days with rain and wind direction frequency.

14. Le Lay, G. Climatologie de Hanoi (Climatology of Hanoi). Bulletin Économique 6:351-356. (In French). Hanoi, 1903. DLC HC441 .A4.

...Describes the instruments used and presents monthly summaries for 1902

Source No. 14 continued.

at Hanoi of absolute extreme temperatures, temperature ranges, mean extreme temperatures, mean temperature, mean relative humidity at 1000 and 1600, mean relative humidity, absolute extreme pressures, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rain (mm.), total number of days with rain and wind direction frequency. Annual values of some of the above items for a 3-year period have been presented for comparison.

15. Le Lay, G. Climatologie de Lang-son (Année 1902)(Climatology of Lang-son in 1902). Bulletin Économique 6:717-722. (In French). Hanoi, 1903. DLC HC441 .A4.

...Contains a list of meteorological instruments at Lang-son and presents monthly summaries at this station for 1902 of absolute extreme temperatures, temperature ranges, mean temperature, absolute extreme pressures, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rain, total number of days with rain and wind direction frequency.

16. Observations météorologiques de l'Indo-Chine pendant le mois (Meteorological observations of Indochina during the month). Bulletin Économique, Vol.3,5 and 6. (In French). Hanoi, 1900-1903. DLC HC441 .A4.

...Presents daily and monthly summaries of extreme temperatures and total rainfall amount at 12 stations in North Vietnam for varying periods during the years November 1899-October 1900, November 1901-October 1903.

1904

17. Le Lay, G. Climatologie de Dong-hoi (Annam)(Climatology of Dong-hoi in Annam). Bulletin Économique 7:1220-1224. (In French). Hanoi, 1904. DLC HC441 .A4.

...Contains monthly summaries for 1903 at Dong-hoi of absolute and mean extreme temperatures, temperature ranges, mean temperature, mean relative humidity, mean relative humidity at 1000 and 1600, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rainfall, total number of days with rain and wind direction frequency.

18. Le Lay, G. Climatologie de Haiphong (Climatology of Haiphong). Bulletin Économique 7:530-535. (In French). Hanoi, 1904. DLC HC441 .A4.

...Presents a list of meteorological instruments and monthly summaries of absolute extreme temperatures, temperature ranges, mean extreme temperatures, mean relative humidity, mean relative humidity at 1000 and 1600, mean pressure, mean pressure at 1000 and 1600, absolute extreme pressures, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rain, total number of days with rain and wind direction frequency at Haiphong in 1903.

19. Le Lay, G. Climatologie de Hanoi (Climatology of Hanoi). Bulletin Économique 7:640-645. (In French). Hanoi, 1904. DLC HC441 .A4.

Source No. 19 continued.

...Records the meteorological instruments and the monthly summaries at Hanoi in 1903 of absolute extreme temperatures, temperature range, mean extreme temperatures, mean temperature, mean relative humidity, mean relative humidity at 1000 and 1600, absolute extreme pressures, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total amount of rain, total number of days with rain and wind direction frequency.

20. Le Lay, G. Climatologie de Lang-son (Climatology of Lang-son). Bulletin Économique 7:759-763. (In French). Hanoi, 1904. DLC HC441 .A4.

...Gives a summary for each month in 1903 at Langson of absolute and mean extreme temperatures, temperature range, mean temperature, absolute extreme pressures, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total rainfall amount, number of days with rain and wind direction frequency.

21. Le Lay, G. Climatologie de Quang-yên (Climatology of Quang-yên). Bulletin Économique 7:765-768. (In French). Hanoi, 1904. DLC HC441 .A4.

...Lists the meteorological instruments at Quang-yên and presents monthly summaries for this station in 1903 of absolute and mean extreme temperatures, temperature ranges, mean temperature, mean relative humidity, mean relative humidity at 0800 and 1600, mean pressure at 0800 and 1600, total rainfall and number of days with rain.

22. Le Lay, G. Climatologie de Vinh (Annam) (Climatology of Vinh in Annam). Bulletin Économique 7:1304-1308. (In French). Hanoi, 1904. DLC HC441 .A4.

...Lists the meteorological instruments at Vinh and presents monthly summaries for this station in 1903 of absolute and mean extreme temperatures, temperature ranges, mean temperature, mean relative humidity, mean relative humidity at 1000 and 1600, mean pressure, mean pressure at 1000 and 1600, mean cloud amount, mean cloud amount at 1000 and 1600, total rainfall amount, total number of days with rain and wind direction frequency.

#### 1905

23. Observations pluviométriques au Tonkin (Precipitation observations in Tonkin). Bulletin Économique 8:582. (In French). Hanoi, 1905. DLC HC441 .A4.

...Presents monthly (February-May) and period (February-May) total number of days with precipitation and total amount of precipitation (mm) for 1905 at 14 stations in North Vietnam.

#### 1907

24. Chauveau, M.A.B. Sur le climat de Hanoi (On the climate of Hanoi). Société Météorologique de France, Annuaire 55: 165-175. (In French). Paris, 1907. DWB M(058) S678 ma.

Source No. 24 continued.

...Describes the sources of data for this study; discusses the temperature, rainfall, and relative humidity in Hanoi; present monthly and annual tabular summaries for Hanoi. These tabular summaries include the following for specified periods (vary by element): mean maximum and mean minimum temperatures; means of absolute maximum and absolute minimum temperatures; absolute maximum and minimum temperatures; mean temperatures; mean temperature at 0730, 1400, 1900, and 2100; mean relative humidity at 0730, 1300, 1900, and 2100; mean relative humidity based on 3 observations; mean vapor pressure based on 2-3 observations; mean, maximum and minimum amounts of rainfall; mean number of rainy days.

25. Le Cadet, G. Observation de l'éclipse de soleil du 14 Janvier 1907. Variations corrélatives des phénomènes météorologiques à l'Observatoire de Phu-Liên (Observation of the eclipse of the sun on January 14, 1907. Correlative variations of meteorological phenomena at the observatory at Phu-liên). 3 pp. (In French). Hanoi, 1907. DWB M/0495 L455.

...Is a description of the partial eclipse of the sun on January 14, 1907 as observed at the Phu-liên Observatory. Observations of pressure, wind, temperature, relative humidity and the actinometric difference from 0900-1800 are presented graphically.

26. Le Cadet, G. Orage avec grêle passé sur Lang-Son, le 30 avril 1907 (Thunderstorm with hail passed over Lang-Son on April 30, 1907). Société Météorologique de France, Annuaire 55:163,164. (In French). Paris, 1907. DWB M(058) S678 ma.

...Describes weather conditions in Lang-Son area from 1700 to 2230 during the thunderstorm with hail on April 30, 1907 and presents some information on the damages.

1908

27. Brenier, H. Répartition saisonnière des récoltes et pluviométrie en Indo-chine (Seasonal distribution of harvests and rainfall in Indochina). Bulletin Economique 11(75):573-599. (In French). Hanoi-Haiphong, 1908. DLC HC441 .A4.

...Is a study on the harvest of crops and the rainfall amount for each season. The source also contains tables with remarks on rainfall for each month and numerical monthly amounts (mm.) of rainfall for representative stations in designated areas of Indochina. These representative stations include Vinh, Thanh-hoa, Dong-hoi, Hagiang, Hanoi, Lao-kay, and Quang-yên.

28. Omodei, D. I cicloni dell'estremo oriente da 0° a 50° di latitudine Nord (Cyclones of the Far East, 0°- 50° N). Annali Idrografici 5 (Anni 1905-1906): 165-230. (In Italian). Genova, 1908. DN-HO VK598 Italy Vol.5, 1905-6.

... Contains a table with monthly summaries over an unspecified period of normal mean pressure for Haiphong.

1909

- 29. Aufray, M. Richesse des eaux de pluie en acide azotique et en ammoniaque (Richness of rain water in nitric acid and ammonia). Indochina, Service de la Statistique Général, Bulletin Économique de l'Indochine 12(81):595-616. (In French). 1909. DLC HC/441 .A4.

...Is a study to determine the amount of nitric acid and ammonia in rain water; presents conditions most favorable for the formation of nitric acid from the analyses made in this study beginning in 1902 and continuing through September of 1909; contains tabular results from the analyses made in the Hanoi Laboratory.

- 30. Indo-China. Observatoire Central Météorologique et Magnétique. Service Météorologique Bulletin mensuel des observations (Monthly bulletin of observations). January 1907, January-May 1909. (In French). Hanoi-Haiphong. DWB C/ed A0-b.

...Presents bihourly observations with monthly summaries of pressure, temperature, vapor pressure, relative humidity, wind direction and speed, solar radiation intensity, cloud amount, transparency of the lower atmosphere and cloud form and direction at the Phu Lien Central Observatory; daily and monthly summaries of mean pressure, extreme pressures for morning and for evening, pressure range, mean temperature, absolute extreme temperatures with range, mean vapor pressure, minimum and mean of day (0600-1800) and maximum (January-May 1909) temperatures at 0.20 m above the grassy surface, mean of day (0600-1800) soil temperature at depths of 0.15 and 0.50 m, mean relative humidity, evaporation, duration of precipitation, mean wind speed, total intensity of solar radiation, mean cloud amount and mean transparency of lower atmosphere at PhuLien Central Observatory. The source also contains for 1-12 stations in North Vietnam observations at 1000 and 1600 with monthly summaries of pressure, temperature, relative humidity, wind direction and force, cloud amount and state of sea; daily and monthly maximum and minimum temperatures and total rainfall amount; monthly mean temperature, mean extreme temperatures, mean pressure, mean relative humidity, mean wind force, prevailing wind direction, mean cloud amount, number of days with rain, state of sea, mean pressure, mean pressure at 1000 and 1600 and mean daily range of pressure.

1910

- 31. Hann, Julius Handbuch der Klimatologie. II. Band: Klimatographie. I. Teil: Klima der Tropenzone (Handbook of climatology. Volume II: Climatology. Part I: Climate of the tropical zone). 426pp. (In German). Stuttgart, 1910. DWB M8 H243hd.

...On pages 256 and 257 discusses the climate of Cochinchina, Annam and Tonkin; on page 246 includes tabular monthly and annual mean temperature, annual mean range of temperature and annual mean maximum and minimum temperatures summarized over the period (8 years) at Hanoi; on page 250 presents tabular monthly and annual amount of rainfall and annual number of days with rain based on 11 years of data for Hanoi.

32. Magnabal, Léon Charles Joseph L'Indo-Chine française (French Indochina). 145pp. (In French). Paris, 1910. DLC DS534 .M3.

...On pages 7-9 includes some remarks on the monsoons, temperature, wind, and rainfall of Indochina.

" 1911 - 1920

1911

33. Le Cadet, G. Le climat du delta du Tonkin (The climate of the Tonkin delta). Extracted from Bulletin Économique de l'Indochine, No.92, September-October 1911, 20 pp. (In French). Hanoi, 1911. DWB C/ed L455.

...Contains brief notes on the Central Observatory of Indochina, pressure, wind, temperature, humidity, evaporation, and sunshine. The source also presents the following for the Central Observatory: tabular monthly and annual variation of pressure, mean pressure, bihourly variation of pressure, mean wind speed (km.), bihourly wind speed, prevailing wind direction, mean temperature, bihourly mean temperature, maximum and minimum temperatures with range, mean relative humidity, mean maximum and minimum relative humidities, mean of the highest and mean of the lowest relative humidities, mean vapor pressure (mm.), mean daily cloud amount (0-10), mean total rainfall amount (mm.), mean total rainfall amount from 0600-1800 and from 1800-0600, number of rainy days, total duration of rainfall in hours, resultant mean intensity of rainfall in mm. per hour, mean number of days with fog, fine rain or crachin, mean number of days with thunderstorms, mean total amount of evaporation, solar radiation intensity at specified hours (0800, 1000, 1200, 1400, and 1600); annual high and low pressures and temperatures for each year (1907-1910); monthly mean total number of hours with sunshine, % of possible sunshine and mean daily duration of actual sunshine. Most of the summaries are based on data for the period 1907-1910.

34. Russier, Henri and Brenier, Henri L'Indochine française (French Indochina). 356 pp. (In French). Paris, 1911. DLC DS534 .R8.

...Contains information on the temperature, wind, and rain in describing the climate of Indochina in Chapter IV. The chapter also includes tabular monthly and annual summaries over an 11-year period (1899-1909) of mean, maximum and minimum temperatures for selected stations (Hanoi in North Vietnam) and a graph showing annual year by year total amounts of rainfall at Hanoi (1891-1909).

1912

35. Hann, J. G. le Cadet: Klima des Delta von Tonkin (G. le Cadet: Climate of the delta of Tonkin). Meteorologische Zeitschrift 29: 125-128. (In German). Braunschweig, 1912. DWB M(05) M589z.

...This is a summary of the most important results of meteorological observations in the delta of Tonkin as published by G. le Cadet. In addition to the textual information the source contains the following tabular data for Phulien: monthly and annual mean pressure, mean temperature, periodic and aperiodic temperature ranges, mean daily maximum and minimum temperatures, mean relative humidity, mean cloud amount, mean amount of rainfall for day and night and total of day

Source No. 35 continued.

and night, mean number of rainy days, mean total rainfall amount, duration of rainfall (hours), days with fog and rainfall, evaporation, duration of sunshine, daily duration of sunshine, % of possible sunshine, and prevailing wind direction; seasonal and annual bihourly variations of mean pressures; seasonal and annual bihourly mean temperatures; annual bihourly wind speeds (mps.). Most of the data are based on the period 1906-1910.

36. Hongkong. Royal Observatory China coast meteorological register. 1894-1912. Hongkong. DWB M06.1/512.5 H772c.

...Includes daily observations at specified hours (1-2 per day usually at 0800 or 1000 and 1600) at Haiphong (1894-1904) and at Phulien (1906-1912) of pressure, temperature, wind direction and force, humidity and weather. Period of record varies by element. For later years (1913-1932) see "Hongkong Royal Observatory, Monthly Meteorological Bulletin."

37. R.D. La déforestation et le régime des pluies (Deforestation and the rainfall regime). Bulletin Economique 15:376-378. (In French). Hanoi-Haiphong, 1912. DLC HC441 .A4.

...Describes the effect of the destruction of the forest on the rainfall regime and the water regime in general.

#### 1913

38. Chassigneux, E. Les dépressions continentales et le climat du Tonkin (The continental depressions and the climate of Tonkin). Revue de Géographie, Annuelle VII (II):1-135. (In French). Paris, 1913. DWB C/ed C488.

...Discusses the weather conditions in Tonkin and the continental depressions during the cold season, the beginning of the warm season, and during summer; presents illustrative tabular observed pressure, wind, and temperature data for selected days during the continental depressions at individual stations in North and South Vietnam during each of these three seasons; describes the climate of Hanoi and the Chinese continental depressions and presents illustrative tabular observed pressure, temperature, wind, cloud amount, relative humidity, and rain on specific days at Hanoi during the three seasons. The stations with illustrative observed data in North Vietnam are Laokay, Langson, Hanoi, Moncay, Phulien, Thanh-hoa, Vinh and Dong-hoi.

#### 1914

39. Brenier, Henri Essai d'atlas statistique de l'Indochine française (Statistical atlas of French Indochina). 256pp. (In French). Hanoi-Haiphong, 1914. DLC HA1732 .B7.

...On pages 4-7 presents a study on the climatology of Indochina. This includes notes on previous climatic studies, rainfall, temperature, monsoons, depressions and typhoons; tabular annual amount of precipitation for each year (1891-1904, 1906-1912) for Hanoi; precipitation maps; graphs showing

Source No. 39 continued.

the monthly (generally based on 7 years of data) number of days with rain and mean total rainfall amount for selected stations in Indochina (Lao Kay, Ha Giang, Lang Son, Hanoi, Quang Yen, Thanh Hoa, Cao Bang and Phu Thy in North Vietnam); graphs showing the monthly mean, mean maximum and mean minimum temperatures for selected stations in Indochina (Hanoi in North Vietnam based on 11 years of data).

40. France. Bureau Central Météorologique Annales. II. Observations (Yearbooks. II. Observations). 1890-1914. (In French). Paris. DWB C/df AO-1 and MF 126-128.

...Contains monthly and annual summaries for each year (number of years varies by station and element but within the period 1890-1914) for 1-36 stations in North Vietnam. The summaries include mean temperature; mean and absolute extreme temperatures; total rainfall amount; number of days with rain; number of days with thunderstorms; means at specified hours of pressure, temperature, vapor pressure, relative humidity and cloud amount; wind direction frequency. For 1-2 stations (Hanoi and Nam-Dinh) during the period 1894-1914 there are also daily observations and monthly summaries at specified hours of pressure, temperature, relative humidity, wind direction and force and cloud amount; daily and monthly extreme temperatures and total rainfall amount; daily remarks.

1915

41. Braemer, P. L'Indochine du Nord (North Indochina). Revue Indochinoise XVIII (9-10):191-220. (In French). Hanoi, 1915. DLC DS501 .R4.

...Discusses briefly the temperature, monsoons, rainfall regime, and relative humidity of the northern part of Indochina.

1917

42. Le Cadet, G. Régime pluviométrique de l'Indochine (Precipitation regime of Indochina). 50pp. Hanoi-Haiphong, 1917. DWB C/ed AO-R.

...Presents explanatory notes on the tabular precipitation summaries in this source; describes the precipitation regime, the daily distribution of rain for Phulien, the precipitation intensity, the kind of precipitation and the chemical content of precipitation in Indochina. The tabular data for individual stations include the following summaries over a period (1-10 years within the period 1906-1915) for 14-31 stations in North Vietnam: monthly and annual mean total rainfall amount (mm.) and mean number of days with measurable rain; annual maximum and minimum total rainfall amounts with years of occurrence and annual daily maximum amount with date; annual maximum and minimum total number of days with measurable rain with years of occurrence; maximum monthly total rainfall amount with month and year of occurrence; maximum monthly total number of days with measurable rainfall with month and year of occurrence. The source also contains the following summaries for the Central Observatory at Phulien: tabular monthly and annual summaries year by year (1907-1915) of total amount (mm.) and duration (hours) of rainfall, total amount (mm.) and duration (hours) of rainfall for 1800-0600 and for 0600-1800, total days with rain, total days and duration (hours) of non-measurable precipitation, total

Source No. 42 continued.

number of days with thunderstorms from Phulien hill; tabular monthly and annual summaries over the period (1907-1915) of mean total amount (mm.) and duration (hours) of rainfall, mean total amount and duration of rainfall for 0600-1800 and for 1800-0600, mean number of days with rainfall, mean amount of rainfall per rainy day, mean amount of rainfall per hour of rain, mean daily duration of rainfall, mean number of days with non-measurable precipitation, mean duration of non-measurable precipitation, mean daily duration of non-measurable precipitation, mean rainfall intensity for 0600-1800 & 1800-0600, mean number of days with thunderstorms observed from Phulien hill, mean duration (hours) of rain (measurable and non-measurable), mean absolute humidity, saturation vapor pressure (mm.), mean relative humidity, mean cloud amount (0-10) between 0600 and 1800, mean cloud amount (0-10) derived from sunshine data, frequency of precipitation between 0600 and 1800 and between 1800 and 0600, evaporation factor and total amount of evaporation (mm.); graphic presentation of rainfall amount (mm.), absolute humidity, saturation vapor pressure, duration of rainfall (hours), mean relative humidity, mean cloud amount (0-10), total amount of evaporation (mm.), frequency of precipitation between 1800 and 0600 and between 0600 and 1800 at Phulien based on data for the period 1907-1915.

1918

43. Constantin, L. L'Hydraulique agricole en Indochine (The Agricultural hydraulics of Indochina). Congr s d' Agriculture Coloniale. Serie Hanoi, No. 15. 83pp. (In French). Hanoi-Haiphong, 1918. DNAL 26 C76H.

...The aim of this source is to give an insight into the work accomplished by the Public Works Service concerning agricultural hydraulics. Since the province of Thanh hoa requires irrigation, a discussion of the rainfall is included. There is also a table presenting total monthly and annual rainfall for each year (1902-1915) and over the period.

44. Le Breton La province de Thanh-h a (The Province of Thanh-h a). Revue Indochinoise XXI(5):511-529. (In French). Hanoi, 1918. DLC DS501 .R4.

...On pages 522-524 presents brief notes on temperature, rain, monsoons, typhoons, and relative humidity in the Province of Thanh-h a.

1920

45. Froc, Louis Atlas of the tracks of 620 typhoons. 1893-1918. Zi-ka-wei Observatory. 4pp. Zi-ka-wei-Chang-hai, 1920. DWB M15.23 F924a.

...Briefly presents some information on typhoons and explanatory notes concerning the charts contained in this source. These charts include North Vietnam.

1921 - 1930

1921

46. Carton, P. La météorologie agricole dans les pays tropicaux, en Indochine en particulier (Agricultural meteorology in the tropical countries, in Indochina in particular). 48pp. (In French). Saigon, 1921. DWB M/1710 C328.

...Discusses the agricultural meteorology and geography in the tropical and equatorial countries with special attention directed toward Indochina. The conclusions are that a network of stations should be created in all tropical and subtropical countries with the hope that this network would extend over the entire world soon. The central organization should collect observations, make deductions, publish conclusions in some publication, and become an organ for consultation and technical information. The wishes for Indochina are (1) to organize an agricultural meteorological and geographical service, (2) to develop a network of agricultural stations in the different states, and (3) to be represented in a permanent international commission of crop ecology.

47. Rouch, J. Essai d'organisation d'un service météorologique colonial (Outline of the Colonial Meteorological Service). Bulletin Économique 24:332-335. (In French). Hanoi-Haiphong, 1921. DLC HC441 .A4.

...Outlines the organization and work of the Colonial Meteorological Service which was established by the French. North Vietnam was a part of a French Colony in 1921.

1922

48. Caillard, Gaston L'Indochine (Indochina). Notre Domaine Colonial VIII. 125pp. (In French). Paris, 1922. DLC DS534 .C3.

...Discusses briefly the monsoons, rainy season and temperature of Indochina on pages 24-28.

1927

49. Bruzon, E. Note sur les typhons (Note on typhoons). Extracted from Bulletin Économique. 9pp. (In French). Hanoi, 1927. DWB M/1530 B914.

...Shows the manner the Central Observatory follows the path of the typhoons and sends out warnings for ships at sea and for the maritime population. The Observatory plots each day (1) a map at 0600 with 4 Indochinese stations and 26 foreign stations, (2) a map at 1000 with all stations of the Indochinese network, (3) a map at 1400 with 4 Indochinese stations and 26 foreign stations, and (4) a map at 1600 with all stations of the Indochinese network. When typhoons enter the China Sea, navigation is warned by special signals and by broadcasts made by the coastal wireless telegraphy stations. The author traces the typhoon from September 17-22 in 1927. He also describes the damage caused by this typhoon.

1928

50. Carton, P. Note sur le climat de l'Indochine (Note on the climate of Indochina). Extracted from *Feuille Mensuelle de Renseignements*, Février 1928. 45pp. (In French). Hanoi, 1928. DWB M82/596 C328n.

...Presents a geographical description of the Indochinese Peninsula; gives a general outline of the climate; describes the temperature regime of the total area and of individual areas of Indochina, winds and monsoons, precipitation regime, humidity, and atmospheric disturbances (cyclonic depressions, typhoons, and thunderstorms) of the Indochinese Peninsula. The source also contains the following: graph showing the mean, mean maximum and mean minimum temperatures, summarized over the period (1907-1926) for Hanoi; graph showing the monthly mean total rainfall amount, summarized over the period for Hanoi (1907-1926); graph presenting the annual amount of precipitation for each year at Hanoi (1907-1926); tabular monthly and annual temperature (mean, mean maximum and mean minimum with range, and absolute maximum and minimum) in °C., measurable rainfall (amount and number of days with), mean relative humidity at 1000, and resultant wind direction for 8-9 stations in North Vietnam (Lao-Kay, Lang-Son, Mon-Cay, Hanoi, Phu-Liên, Thanh-Hoa, Vinh, and Dong-Hoi); tabular monthly and annual mean total amount of rainfall and mean number of days with measurable rainfall, summarized over specified periods (vary by station) for about 36 stations in North Vietnam.

51. Sion, Jules Asie des moussons (Monsoon Asia). *Géographie Universelle IX* (1):1-272. (In French). Paris, 1928. DWB C/e S618.

...Describes the mechanism of monsoons in winter and summer, presents the general characteristics of the monsoon, discusses the classification of climates and summarizes some results of monsoons in Monsoon Asia. Monsoon Asia includes India, Pakistan, Burma, Thailand, Cambodia, Laos, North Vietnam, South Vietnam, China, Korea, Japan, Taiwan, the Philippine Islands, Java, Sumatra, Borneo, and the Celebes.

52. Zych, Stanisław O wahaniach temperatury na obszarze Japonji, Chin i Indochin w latach 1910-1919 (Variations of temperature observed in Japan, China and Indochina during the period 1910-1919). *Kosmos* 52:183-299. 1927. (In Polish with a French summary). Lwow, 1928. DLC Q4 .K7.

...Is a study on the variation of temperature in China, Korea, Indochina and Japan. The tables present monthly and annual mean temperature summarized over the period (1910-1919) with monthly and annual departures for each year (1910-1919) for individual stations. These stations include Lao-Kay, Lang-Son, Haiphong, Moncay, Thanh-Hoa, Vinh and Dong-Hoi in North Vietnam.

1929

53. Indo China. Service Géographique Croquis relatifs à la fréquence et à la marche des typhoons pendant la période de 1911 à 1929 (Surveys relative to the frequency and the path of typhoons during the period 1911-1929).

Source No. 53 continued.

(In French). DLC Map Division.

...Presents a table showing the monthly frequency of typhoons in the China Sea during the period 1911-1929.

54. Robequain, Charles Le Thanh Hoa. Etude géographique d'une Province Annamite (Thanh Hoa. Geographical study on an Annamite Province). Tome premier. Publications de l'Ecole Française d'Extrême-Orient XXIII. 251 pp. (In French). Paris and Bruxelles, 1929. DLC DS557 .A6T5.

...On pages 1-52 describes the average and general traits of the climate, the annual change in the climate and type of weather, the climate of Thanh-Hoa, the irregularity of precipitation, and the climate of the back country. Appendix no. 1 contains the following monthly and annual summaries over the period (1907-1926) for Phu Lien, Thanh Hoa, and Vinh: mean maximum and minimum temperatures with range; absolute maximum and minimum temperatures; mean total rainfall amount (mm.) and number of days with rain; mean relative humidity at 1000; resultant wind direction. The source also presents in appendix 2 seasonal (November-January; February-March; April-July; August-October) and annual maximum and minimum amounts of precipitation with years of occurrence, precipitation range, mean total amount of precipitation, and variability of precipitation based on data for the period 1907-1926 for the same stations.

1930

55. Bruzon, E. and Carton, P. Le climat de l'Indochine et les typhons de la Mer de Chine (The climate of Indochina and the typhoons of the China Sea). 310pp. (In French). Hanoi, 1930. DWB M82/596 B914c1.

...In Part I on the climate of Indochina presents the network of meteorological and climatological stations of the area and a description of the instruments installed at the different classes of stations; describes the location, topography and general weather conditions of the area; discusses the pressure and wind regimes, temperature, precipitation regime, humidity, dew, morning fogs, evaporation, sunshine, cloud amount, and atmospheric disturbances in Indochina; contains maps, graphs, and tabular summaries. The summaries for North Vietnam include the following: tabular monthly and annual mean wind speed (kph and mps) and mean extremes with years of occurrence of wind speed for Phu-Liên summarized over the period 1907-1929; graph comparing monthly mean temperatures (1907-1929) at Nhatrang, Hué and Vinh; graph comparing monthly mean temperatures (1907-1929) at Thanh-Hoa and Luang-Prabang; graph showing monthly mean, mean extreme and absolute extreme temperatures at Hanoi (1907-1929); tabular monthly and annual summaries year by year (1907-1929) of departures from normal of mean temperatures and total rainfall amounts at Hanoi; graphs showing monthly values of mean rainfall amount and total number of days with rainfall at Hanoi (1907-1929); tabular monthly and annual mean and extreme amounts of rainfall (mm.) and mean and extreme number of days with measurable rain for approximately 70 stations for specified periods (vary by station but within the period 1907-1929); graphs showing the annual values for each year (1907-1929) of total rainfall amount, total number of days with rain and departure of rainfall amount

Source No. 55 continued.

from normal at Hanoi; tabular annual summaries for each year of snow (1916-1930) and hail (1918-1930) at Chapa; tabular monthly and annual summaries of mean vapor pressure at Phu-Liên (1907-1926) and Hanoi (31/2 years), mean relative humidity at Hanoi (1927-1929) and Phu-Liên (1907-1929), mean maximum and minimum and absolute minimum relative humidities at Phu-Lien (1907-1929), and mean evaporation (mm.) at Phu-Liên (1907-1927); tabular monthly and annual duration of sunshine (hours), saturation deficit (mm.), total rain amount (mm.), number of days with rain, number of days with fog and crachin and mean wind speed (kph.) at Phu-Liên (1907-1929); tabular monthly and annual extreme amounts, mean daily amount, and frequency within specified limits (0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, and 9-10 mm.) of evaporation at Phu-Liên (1907-1929); tabular monthly and annual total amount and mean daily amount of evaporation (mm.) based on data for 1928-1930 at Tuyên-Quang and La-Pho and based on data for unspecified periods at Thanh-Ba, Phu-Hồ, Phu-Lang-Thuong, Phat-Diêm and Cao-Trai; tabular monthly and annual mean and extreme durations of sunshine (hours) and mean and extreme daily durations of sunshine (hours) at Phu-Liên (1907-1929); tabular monthly mean and extreme cloud amounts (0-10) at Phu-Liên (1907-1929); tabular monthly and annual mean cloud amounts (0-10) at Lao-Kay, Lang-Son, Moncay, Hanoi, Haiphong, Thanh-Hoa, Phu-Liên, Vinh, and Dong-Hoi based on data for the period 1907-1929; tabular monthly and annual mean number of days with thunderstorms (1907-1929) at the Central Observatory; tabular monthly and annual mean temperature, mean maximum and minimum temperatures with range, absolute maximum and minimum temperatures with range, mean total amount of rainfall, mean number of days with rainfall, greatest and least amount of rainfall with years of occurrence, and mean relative humidity based on data for specified periods within the period 1907-1929 at Lao-Kay, Chapa, Lang-Son, Moncay, Hanoi, Haiphong, Phu-Liên, Thanh-Hoa, Vinh, and Dong-Hoi; tabular monthly and annual mean maximum and minimum and absolute minimum relative humidities based on data for specified periods (within the period 1907-1929) at Lang-Son, Moncay, Hanoi, Haiphong and Phu-Liên; graphs showing the monthly distribution of various climatic elements for Phu-Liên.

56. Carton, P. Climats tropicaux, acclimatement et acclimatation (Tropical climates, acclimation and acclimatization). Extracted from Bulletin général de l'Instruction publique, 9<sup>e</sup> an., Nos. 8-9, April-May 1930. 35pp. (In French). Hanoi, 1930. DWB M/1730 C328c.

...Is an almost complete translation of a study on climate and acclimatization by Aldo Castellani with additions of certain general climatological considerations and diverse data concerning Indochina. The information on Indochina includes the following for North Vietnam: graphs showing the monthly mean relative humidity, mean temperature, and mean total rainfall amount (mm.) summarized over unspecified periods at Hanoi; annual mean diurnal variation of pressure (mm.) at Phu-Liên based on data for an unspecified period; textual information on pressure for Phu-Liên.

57. Carton, P. La météorologie agricole en Indochine (Agricultural meteorology in Indochina). 15pp. (In French). Hanoi, 1930. DWB M/1710 C328ma.

...Gives the principal reasons for the lack of climatological studies, especially those dealing with agricultural meteorology in the early years; presents some results of the reorganization of the Meteorological Service

Source No. 57 continued.

of Indochina in 1926-1927; describes the climatological network of Indochina and the meteorological instruments installed at the meteorological and climatological stations; contains notes concerning forecasting for agricultural purposes.

58. Carton, P. La météorologie et ses applications dans les pays tropicaux (Meteorology and its application in the tropical countries). 20pp. (In French). Hanoi, 1930. DWB M/1710 C328m.

...Discusses the weather forecast for the needs of tropical agriculture, agricultural warnings of disease and weather in the tropical countries, principles of agricultural ecology, agricultural ecology in the tropical countries particularly in Indochina, and other studies foreseen in colonial agricultural meteorology. The source also contains photographs of two of the principal agricultural stations. These stations are Phu-Hồ in North Vietnam and Quinquina of Lang-Hanh in South Vietnam.

59. Carton, P. Température du sol a Phu-Liên, Tonkin (Soil temperature at Phu-Liên, Tonkin). Bulletin Économique de l'Indochine, 33: 688B-707B. Hanoi, September 1930. DLC HC441 .A4.

...Gives a brief history of the soil temperature observations at Phu-Liên describes the installation of the new self-recording instrument and summarizes the results of observations for July 1929 to June 1930 by tables and graphs. The tables include monthly and annual (July 1929-June 1930) mean and mean extreme air temperatures and soil temperatures at depths of 15 cm. and 50 cm.

60. Guilmet, B. Quelques observations sur l'évaporation à l'Observatoire Central de Phu-Liên. (Some observations on the evaporation at the Central Observatory at Phu-Liên). Bulletin Économique de l'Indochine 33:113B-125B. (In French). Hanoi, February 1930. DLC HC441 .A4.

...Briefly describes the instrument used, the anomalies observed and the new Delcambre evaporimeter; discusses the evaporation at Phu-Liên observed in an Eiffel shelter (modified for tropical countries) by a Piche evaporimeter, frequency of different evaporation values, evaporation on free water surface and research on evaporation; presents tabular monthly summaries of total evaporation amount, mean daily amount of evaporation, absolute extreme amounts of evaporation with years of occurrence, mean wind speed, prevailing wind direction, mean temperature in the shade, duration of sunshine, mean relative humidity, mean total rainfall amount, mean number of days with rain, mean number of days with fog and crachin, saturation deficit, frequency of evaporation within defined limits (0.0, 0.1-0.9, 1.0-1.9, 2.0-2.9, 3.0-3.9, 4.0-4.9, 5.0-5.9, 6.0-6.9, 7.0-7.9, 8.0-8.9, 9.0-9.9, 10.0-10.9 and 11.0-11.9 mm) and frequency of evaporation within specified limits (0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, and 9-10 mm) of the free water surface at Phu-Liên based on data for the period 1907-1927.

61. Indochina. Agence Economique Les stations climatiques de l'Indochine (Health resorts in Indochina). Publication XXV. 36pp. (In French). 1930. DNAL 22.5 In22.

Source No. 61 continued.

...Presents a map showing the location of the health resorts in Indochina; contains graphs showing the monthly mean temperatures (C.) for Saigon, Hanoi, Dalat, and Chapa; includes comparative tabular annual summaries of mean maximum and minimum temperatures, mean temperature, rainfall amount, number of days with rain, and mean relative humidity for Dalat, Saigon, Chapa and Hanoi; presents notes on the location and the climate of the mountain resorts (Le Bokor, Dalat, Bana, Chapa, and Tam Dao) and the seashore resorts (Kep, Cap Saint Jacques, Nhatrang, Cua Tung, Cua Lo, Samson, and Do Son).

62. Indo-China. Service Météorologique Bulletin pluviométrique (Precipitation bulletin). 1906-1930. Phu-Liên. DWB C/ed AO (1906-1928) and C/ed AO-a (1929 and 1930 as supplement to Annales du Service Météorologique).

...Presents tables with daily precipitation amount for 15-107 stations for 1910-1930; monthly and annual summaries of number of days with precipitation, number of days with traces of precipitation and total amount of precipitation for each year (1906-1930) at 20-107 stations; monthly and annual summaries of total amount of precipitation for night and total amount of precipitation for day for each year (1906-1928) at 20-90 stations; monthly maximum amount in one day of precipitation with date of occurrence, maximum amount of precipitation during the day and during the night with dates of occurrence for each year (1906-1928) at 20-90 stations; monthly and annual summaries for each year (1907-1928) of total duration of precipitation, total duration of precipitation during day and total duration of precipitation during night and monthly daily maximum duration of precipitation with date of occurrence, maximum duration of precipitation during day with date of occurrence and maximum duration of precipitation during night with date occurrence at Phu Lien. In the volume containing the data for 1928 there are monthly and annual summaries over the period (varies by station) of greatest and least amounts of precipitation with years of occurrence, mean total amount of precipitation, maximum amount of precipitation in one day and number of days with precipitation for about 70 stations in North Vietnam.

63. Palau. Meteorological Observatory Data of tropical climate. Vol. I and II. (In Japanese and English). Palau, January 1928 and March 1930. DWB M82.2/266 P154b.

...In Volume I includes tabular monthly and annual mean total rainfall amount (mm) and mean number of days with rain  $\geq 0.1$  mm, summarized over specified periods for 26 stations in North Vietnam. In Volume II the source contains the following monthly and annual summaries over unspecified periods at Lao-Kay, Lang-Son, Mon-Cay, Hanoi, Phu-Lien (Central Observatory), Chapa, Thanh-Hoa, Vinh, and Dong-Hoi: mean, mean maximum and minimum with range, and absolute maximum and minimum temperatures; mean relative humidity; prevailing wind direction (no wind data for Chapa).

64. Theaman, John R. Clippings of weather records. Indianapolis, 1930 or later. DWB C/a T374.

...Is a compilation of unusual weather records from various parts of the world. Among these the compiler includes the record rainfall of 52.81" at Kebo in 4 days on September 21-24 in 1927.

65. Rapport au Gouverneur Général sur la période de 1928-29 (Report to the Governor General on the period 1928-29). Bulletin Économique de l'Indochine, Section B, 33(1):1-82. (In French). Hanoi, 1930. DLC HC441 .A4.

...On pages 31 and 32 gives a report on the activities of the Bureau of Climatology and Agricultural Meteorology for 1928-29 in Indochina.

1931 - 1940

1931

66. Braak, C. Klimakunde von Hinterindien und Insulinde (Climate of the East India Islands and Southeast Asia). Handbuch der Klimatologie, Band IV, Teil R. 125pp. (In German-translated into English in 1943 by A.A.F.). Berlin, 1931. DWB M8 H236h.

...Gives some textual information on temperature, rain, wind, fog, and humidity in Tonkin and Annam. The source also contains information on storms, thunderstorms and typhoons; tabular monthly distribution of cyclones in the China Sea; tabular summaries for individual stations in Indochina. These tabular summaries over the period include the following for stations in North Vietnam: monthly and annual mean daily maximum and minimum temperatures and mean temperature for each month (May-September), summarized over an unspecified period at Hanoi; monthly mean daily minimum relative humidity at Phulien (1907-1926); monthly mean total rainfall at night (1800-0600) and during the day (0600-1800) based on data over an unspecified period at Phulien; monthly and annual mean temperature and daily deviation of temperature at Chapa (period of record not specified); January mean daily and absolute minimum temperatures at Laokay, Chapa and Hanoi based on data for an unspecified period; monthly and annual mean daily maximum and minimum temperatures with range at Thanh-hoa (period of record not specified); annual mean total amount of precipitation for Phulien (20 years); monthly and annual mean temperature (°C) and mean total rainfall amount (mm.), annual mean extremes of temperature, maximum and minimum annual amounts of precipitation with years of occurrence, and climatic classification for Lao-kay (1907-1926), Vinh (1907-1926), and Hanoi (1907-1926); monthly and annual mean sea level pressure for Phulien (1904-1914); monthly wind direction (8 points and calm) frequency in % at Hanoi (1905-1914); monthly mean and annual mean minimum relative humidities (1907-1926) at Hanoi and Phulien; monthly and annual mean relative humidity at 1600 for Hanoi (period of record not specified), mean wet bulb temperature for Hanoi (1907-1926), mean cloud amount (%) for Hanoi (1905-1913) and Phulien (1907-1926), mean number of days with rain  $\geq 0.1$  mm. at Hanoi (1907-1927), mean number of days with thunderstorms for Delta von Tonkin (1907-1926), and number of hours of sunshine at Phulien (1907-1927).

67. Carton, P. Considérations sur l'importance et les méthodes de mesure de l'évaporation en météorologie agricole (Considerations on the importance and the methods of measuring evaporation in agricultural meteorology). Bulletin Économique de l'Indochine, B, 34:900B-933B. (In French). Hanoi, October 1931. DLC HC441 .A4.

...Presents problems concerning instruments and procedures; discusses the laws of evaporation, evaporation in nature, evaporimeters and atmometers, Piche's atmometer, Piche's evaporimeter, Delcambre's evaporimeter, and Livingston's atmometer; compares results obtained from different instruments and under different conditions at Phu-Liên; compares results obtained at Phu-Liên with results from Phu-Hồ; presents tabular monthly amount of evaporation (mm.), summarized over the period for Tuyên-Quang (February 1928-July 1931) and La-pho (January 1928-July 1931), Thanh-ba, Phu-Hồ, Phu-lang-Thuong, Phat-diêm, and Cao-trai in North Vietnam; includes monthly tabular amount of evaporation (mm.) in 1930 at Lao-Kay, Moncay, Hanoi, Haiphong, Thanh-hoa, Nhu-Xuân, Cua-rao, Vinh and Dong-hoi in North Vietnam.

68. Carton, P. Heures moyennes des minima et des maxima de température en Indochine (Mean hours of minimum and maximum temperatures in Indochina). Bulletin Économique de l'Indochine B, 34:687B-715B. (In French). Hanoi, August 1931. DLC HC441 .A4.

...Discusses the mean hour of the minimum temperature, mean hour of the maximum temperature and the best hours for observations at the climatological and agricultural meteorological stations in Indochina. The source also contains the following data: tabular monthly mean time of minimum temperature and mean time of sunrise with difference at Phu-liên based on data for the period 1907-1929; graphs showing monthly and annual mean diurnal variation of temperature and relative humidity at Phu-Liên; tabular monthly mean time of minimum temperature based on data for the years 1929-1930 and monthly mean time of sunrise (used the 15th of each month) with the difference (positive if minimum temperature is before sunrise and negative if it is after sunrise) for about 16 stations in North Vietnam; tabular monthly and annual time of maximum temperature at Phu-Liên based on data for the period 1907-1929; tabular monthly time of maximum temperature based on data for the years 1929-1930 at approximately 16 stations in North Vietnam.

69. Carton, P. Instructions pour les chefs de stations de météorologie et d'écologie agricoles (Instructions for the chiefs of agricultural stations of meteorology and ecology). Bulletin Économique de l'Indochine 34:573B-633B. (In French). Hanoi, July 1931. DLC HC441 .A4.

...Discusses the generalities on agricultural ecology considered from the point of view of meteorological factors; the influence of temperature, humidity, rain, light, evaporation and wind on vegetation; the influence of temperature, relative humidity, sunshine and wind on plant diseases; the influence of temperature, sunshine, humidity, rain and wind on parasitic animals.

70. Du Pasquier, R. Observations faites à la station expérimentale de Phu-Hô au cours de l'année 1930 (Observations made at the experimental station at Phu-Hô in 1930). Bulletin Economique de l'Indochine B,34:440B-482B. (In French). Hanoi, June 1931. DLC HC441 .A4.

...On pages 460B and 461B describes the effects of particular meteorological conditions on different plants cultivated at Phu-Hô; presents graphs showing the daily duration of sunshine (hours), mean cloud amount (0-10), maximum and minimum earth surface temperatures, mean and maximum earth temperatures at a depth of 0.15m., maximum and minimum air temperatures, evaporation(mm.), mean and maximum relative humidity, wind direction and speed, and days with various phenomena during January 1930 at the Experimental Station of Phu-Hô; presents graphs of monthly mean cloud amount (0-4) at 1000 and 1600, rainfall amount (mm.), maximum and minimum temperatures, mean daily maximum and minimum temperatures, number of days with rain, and mean relative humidity at 1000 and 1600 for 1930 and summarized over the period 1922-1929 at Phu-Hô. The graphs are presented at the beginning of the August 1931 issue with a note indicating that these should be placed between pages 460B and 461B in the June 1931 issue.

71. Gourdon, Henri L'Indochine (Indochina). 224pp. (In French). Paris, 1931. DLC DS534 .G56.

...On pages 20-28 discusses the winds, monsoons, temperature, and rainfall in Indochina.

72. Guilmet, B. Observations actinométriques de l'Observatoire central de l'Indochine a Phu-liên (Actinometric observations at the Central Observatory of Indochina at Phu-Liên). Bulletin Economique de l'Indochine B,34:1114B-1127B. (In French). Hanoi, December 1931. DLC HC441 .A4.

...Gives the results of 21 years of observations with an Arago-Davy Actinometer at the Central Observatory of Indochina; presents information on the precision, accuracy, and sensitivity of the instrument; describes the location of the instrument; gives the hours of observation; discusses the search for a formula which permits the utilization of observations with a Arago actinometer to compute global radiation received at the surface of the earth, approximate values of the amount of heat produced at the surface of the earth by global radiation and by diffused radiation in the Tonkinese Delta, and the results of the study; compares the results of this study with values obtained at Parc Saint-Maur; contains illustrative tables and graphs of radiation for Phu-Liên.

73. Indochina, French L'Annam (Annam). 227pp. (In French). Hanoi, 1931. DLC DS557 .A5A17.

...The section on geography by B.Bourotte in Chapter I presents a description of the temperature, pressure, wind and rain of Annam on pages 40-44.

74. Indo-China, French. Exposition Coloniale Internationale, Paris 1931, Section des Services d'Intérêt Social Le Service Météorologique et l'Observatoire Central de l'Indochine. (The Meteorological Service and Central Observatory of Indochina). 20pp. (In French). Hanoi, 1931. DLC QC875 .I5852.

Source No. 74 continued.

...Consists of notes on the history of the Meteorological Service and the Central Observatory of Indochina, the different branches of the Meteorological Service and the Central Observatory, the personnel of the Meteorological Service, the network of stations for meteorological observations, the Service for Forecasting Weather and Warnings, the Service of Climatology and Agricultural Meteorology, Hourly Service, Seismological Service and periodical publications of the Central Observatory. These publications include (1) Annales du Service Météorologique, (2) Bulletin pluviométrique annuel, (3) Bulletin mensuel des observations des stations du réseau climatologique, (4) Bulletin météorologique quotidien (de midi), (5) Bulletin circulaire quotidien (de 18 heures) à l'usage des navigateurs, (6) Avis de typhons and (7) Bulletin séismique (mensuel).

75. Iyer, V. Doraiswamy The Bengal cyclone of September 1919. India Meteorological Department, Scientific Notes III(29):121-129. Calcutta, 1931. DWB M(055) I39s.

...Traces a typhoon in the Pacific and a disturbance over the China Sea, the Indo-Chinese Peninsula and the Andaman Sea to a cyclone in Bengal in September 1919.

76. Köppen, W. Grundriss der Klimakunde (Outline of climatology). 338pp. (In German). Berlin and Leipzig, 1931. DWB M8 K78g.

...Includes the following tabular summaries over an unspecified period on pages 331 and 359 for Haiphong: mean temperature, mean precipitation amount, mean cloud amount, mean number of days with precipitation, mean relative humidity, and mean aperiodic daily variations of temperature for months with highest and lowest means (months are designated); annual mean and extreme temperatures; annual mean total precipitation amount.

77. Pouyanne, A. A. L'Hydraulique agricole au Tonkin. (Agricultural hydraulics in Tonkin). 124pp. (In French). Hanoi, 1931. DLC TC513 .T6P6.

...Presents the three needs of Tonkin, namely (1) protection against floods along the Red River, (2) irrigation of highlands to guarantee a rice crop and (3) drainage of flooded low areas; describes the rainfall regime of Tonkin; shows the relation of the rainfall regime and the configuration of the soil; discusses irrigation.

78. Pouyanne, A. A. L'Hydraulique agricole au Tonkin. Atlas. (Agricultural hydraulics in Tonkin. Atlas). (In French). Hanoi, 1931. DLC TC513 .T6P6.

...Contains graphs showing seasonal (December-May 15; June-August; July-November) and annual precipitation amounts with numerical values for each year and over the period (1907-1929) and monthly precipitation amounts over the period (1907-1929) for Hanoi; graphs showing rainfall amounts summarized for each year (1923-1929) and over the period for June, July, August and September at Gia-Lam, Ban-Yen-Nhan, Hung-Yen, Hanoi and Nam-Dinh.

79. Reed, W. W. Temperatures in Asia. 95pp. Washington, 1931. DWB C/e R327.

...Includes the following monthly and annual data, summarized over specified periods: mean and mean extreme temperatures (°F) for Chapa (6 years), Hanoi (9 years), Langson (20 years), Laokay (20 years), Phu Lien (20 years), and Vinh (20 years); absolute extreme temperatures (°F) for Chapa (8 years), Hanoi (35 years), Langson (23 years), Laokay (25 years), Phu Lien (23 years), and Vinh (23 years).

80. Russier, Henri with the collaboration of Henri Gourdon and Edouard Russier L'Indochine française (French Indochina). 123pp. (In French). Hanoi-Haiphong, 1931. DLC DS534 .R8.

...Describes the climate of Indochina on page 10 and the climate of individual areas (Tonkin and Annam) on pages 16 and 40. The description contains information on temperature, winds, monsoons, typhoons and rain.

81. Theaman, John R. Heavy rainfall records ranging in duration from one minute to hourly, daily, monthly and annually. Book No. 2. 72pp. Indianapolis, May 1931. DWB C/A T374h.

...Records the excessive amounts of rainfall with date and duration for Phu-Lien (page 20) and Hanoi (page 30) and 24-hour excessive rainfall amounts with date and duration at Thanh-Ba and Tien-Tri on page 52 and Kebo on page 54.

82. Diagramme météorologique des mois de..., (Meteorological diagram for the months of...). Bulletin Economique, Volumes 20-34, 1917-1931. (In French). Hanoi. DLC HC441

...Presents graphs with daily mean cloud amounts, hours of sunshine, extreme temperatures, mean pressures, evaporation, extreme relative humidities, state of sky and weather phenomena for January 1917-June 1931 at Phu-Lien.

### 1932

83. Abbaticci, S. Climatologie de l'Indo-Chine (Climatology of Indochina). Traité de Climatologie Biologique et Médicale III:2275-2291. (In French). Tours, circa 1932. DWB M86 P624tr.

...Presents the following information: general characteristics of the Indochinese climate; tabular annual absolute maximum and minimum temperatures at Hanoi and annual maximum and minimum pressures at Phu-Lien in North Vietnam based on data for unspecified periods; monthly and annual mean duration of sunshine and annual extreme durations of sunshine in hours at Phu-Lien (1907-1927); tabular monthly (October-March) mean temperature, absolute maximum and minimum temperatures, mean amount of rain (mm.) and prevailing wind direction at Phu-Lien based on data for unspecified periods; brief notes on the climate of Tonkin and Annam.

84. Brooks, C. E. P. Climate. A handbook for businessmen, students and travellers. Second edition: Revised. 199pp. London, 1932. DWB M/1700 B873.

...On pages 98-107 presents textual information on the climate of India and Further India. The area extends from the Arabian Sea to the Pacific Ocean between 30°N. and the equator. In the text there is some information on pressure, cloudiness, rainfall, wind, and temperature for Indochina. The source also contains the following tabular data summarized over a 13-year period for Phu-Lie : monthly and annual mean temperature (F°) and mean total rainfall amount (inches); January and July daily temperature range; annual mean maximum and minimum temperatures; annual absolute maximum and minimum temperatures; January and July mean relative humidity and mean cloud amount; annual number of days with rain.

85. Du Pasquier, R. Observations faites à la station de Phu-hô au cours de l'année 1931 (Observations made at Phu-ho during 1931). Bulletin Economique de l'Indochine 35:622B-632B. (In French). Hanoi, September-October 1932. DLC HC441 .A4.

...Includes graphs showing the monthly distribution of mean relative humidity at 1000 and 1600, mean cloud amount (0-4) at 1000 and 1600, number of days with rain, amount of rainfall (mm.), mean daily extremes of temperatures and extreme temperatures for 1931 and for the period 1922-1930 at Phu-hô.

86. Hongkong. Royal Observatory Monthly meteorological bulletin. 1913-1932. Hongkong. DWB M06.1/512.5 H722 ma.

...Includes daily observations (1-2 per day usually at 0600 or 0700 and 1400 or 1500) at Phulien of pressure, temperature, wind direction and force, humidity, weather and visibility. Period of record varies by element. For earlier years see "Hongkong Royal Observatory, China Coast Meteorological Register."

87. Marchi, Luigi de Climatologia (Climatology). Second edition. 289pp. (In Italian). Milano, 1932. DWB C/a M317c.

...Contains brief notes on the climate of Indochina. The author also presents tabular annual mean total precipitation amount (mm.), mean temperature for a winter month (January), and mean temperature for a summer month (June) at Hanoi.

1933

88. Philippine Islands. Weather Bureau Weather map of the Far East. 1927-1933. Manila. DWB.

...Presents observations at 0600 of pressure, temperature, wind direction and force, and weather and pressure difference in 24 hours at Phulien (1927-1933).

89. U. S. Navy Department Aerological charts for the Siberia, Japan, French Indochina, India, Philippine Islands and China area. [1933]. DWB M82.3/266.5 U585a.

Source No. 89 continued.

...Discusses general weather conditions for each month for eastern Asia (Siberia, Japan, Laos, Cambodia, North Vietnam, South Vietnam, India, Philippine Islands and China).

1934

90. Bruzon, E. and Guilmet, B. Typhons d'Indochine (Typhoons of Indochina). *Annales de Physique du Globe de la France d'Outre-Mer* 1(4):119-125. (In French). Paris, August 1934. DWB P.

...Bruzon presents the change of the atmospheric situation from October 31-November 6, 1930 in his study on the typhoon of November 5, 1930 at Poulou-Condore. He also traces the movement of the typhoon of May 3-4, 1932 in South Annam from 0500 on April 29 to 0230 on May 4. Guilmet describes the weather conditions from October 12-17 in his study on the typhoon of October 16, 1932 at Binh-Dinh-Kontum; from October 22 at 1300 to the morning of November 2 in his article on the typhoons at Padaran on October 25 and Quang-Tri on November 1-2, 1932; from September 13-18 in his description of the typhoon of September 17 at Fort-Bayard. Although these typhoons are primarily in South Vietnam and China, some references are made to conditions at places in North Vietnam.

91. Carton, P. Le climat de l'Indochine (The climate of Indochina). Extracted from *Bulletin général de l'Instruction publique*, No. 2, 1934. 31pp. (In French). October 1934. DWB M82/596 C328c.

...Discusses the tropical climates and monsoon regimes in Asia, the Meteorological Service of Indochina, location and geographical characteristics of Indochina, pressure and wind regimes, temperature, precipitation regime, humidity, dew and morning fogs, evaporation, sunshine and cloudiness and atmospheric disturbances (lows, typhoons, waterspouts, thunderstorms, and squalls). In addition to the textual information the source contains the following: tabular temperature summaries (annual mean maximum and minimum with range, annual mean, the highest monthly mean and the lowest monthly mean with range, the highest monthly mean maximum and the lowest monthly mean minimum, the highest monthly mean minimum and the lowest monthly mean minimum, range between highest monthly mean maximum and lowest monthly mean minimum and annual absolute maximum and minimum) at Chape, Hanoi, and Thanh-Hoa for specified periods; graph showing the monthly mean total amount of precipitation (mm.) for Hanoi; tabular monthly and annual mean total rainfall at Hanoi; graph showing the annual mean total amount of precipitation for Hanoi in North Vietnam; graph showing the mean diurnal variation of temperature and relative humidity for Phu-liên in North Vietnam; graphs showing the variation of mean cloudiness and the variation of mean diurnal duration of sunshine for Phu Liên in North Vietnam.

92. Carton, P. Considérations sur l'emploi de formules utilisant les valeurs des extrêmes pour obtenir les moyennes approximatives de température et d'humidité relative - Contribution à l'étude du climat de l'Indochine (Considerations on the use of formulas using the values of extremes to obtain the approximate means of temperature and of relative humidity - Contribution to the study of the climate of Indochina). Bulletin Économique de l'Indochine 37:955-981. (In French). Hanoi, September-October 1934. DLC HC 441 .A4.

...The purpose of this study is to make known the results of the author's investigation and to call attention to the usefulness of collecting identical records for all the other countries of the world in order to draw some general conclusions and to adopt the best methods to obtain in all places some comparable climatological data. The tables present monthly and annual summaries over the period (1907-1933) of true mean, mean ( $\frac{M + m}{2}$ ) and departures of mean ( $\frac{M + m}{2}$ ) from true mean of temperature and relative humidity for Phu-liên. Monthly and annual temperature departures are included for Tuyên-Quang, Phu-ho, Hanoi and Vinh and monthly and annual relative humidity departures for Phu-ho, Hanoi, Thanh-Hoa, Vinh and Dong-Hoi in North Vietnam. These departures are based on data for 3-4 years.

93. Carton, P. Nouvelle classification des climats; application à l'Indochine (New classification of climates; application to Indochina). Bulletin Économique de l'Indochine 37:1155-1168. (In French). Hanoi, November-December 1934. DLC HC441 .A4.

...Discusses the different classifications of climate, critically examines the principal classifications, describes a proposed classification and applies this proposed classification to Indochina.

94. Chevy, P. and Carton, P. Les courants de la mer de Chine meridionale et leurs rapports avec le climat de l'Indochine (Currents of the South China Sea and their relation to the climate of Indochina). Institut Oceanographique de l'Indochine, Note 26. (In French). Hanoi, 1934. DN-HO SH307 I6N5.

...Is a study on the effect of the South China Sea currents on the climate of Indochina.

95. Great Britain. Meteorological Office Réseau mondial (World network). 1910-1934. London, 1920-1957. DWB MO6.1 G786r.

...Includes the following tabular monthly and annual summaries for each year (1910-1934) at Moncay and Phu Lien: mean station level (not reported for entire period) and sea level pressure (mb.); mean maximum and minimum temperatures (°A), maximum and minimum temperatures (°A) with dates and mean temperature (°A); total amount of precipitation (mm.); difference from normal of pressure (mb.) mean temperature (°A) and total precipitation amount (mm.).

96. Hubert, Henry Les cyclones tropicaux dans les colonies françaises (Tropical cyclones in the French colonies). *Annales de Physique du Globe de la France d'Outre-Mer* 1(4):97-104, 109-116. (In French). Paris, October 1934. DWB P.

...Deals with the distribution of streamlines in tropical cyclones in the French colonies. This includes information on the graphic presentation of the distribution of streamlines, the dissymmetry of tropical cyclones, the contrast of the two air currents in the tropical cycle, the distribution of streamlines in the upper air and the practical results of previous observations. The author also presents the air flow at the surface and in the upper air diagrammatically during typhoons on July 23, 1932; July 3, 1933; November 1, 1933; October 2, 1933.

97. Hubert, Henry Étude comparative des climats des colonies françaises (Comparative study of climates of the French colonies). *Annales de Physique du Globe de la France d'Outre-Mer* 1(2,3):33-62, 69-96. (In French). Paris, April and June 1934. DWB P.

...Differentiates between the climates of the French colonies by grouping stations into series and bringing out the peculiarities of the same meteorological elements for each locality. The source presents graphs showing the following monthly data for Lai-Chau, Dong-Hoi, Vinh, Hanoi, Thanh-Hoa, Moncay, Lao-Kay, Tuyen-Quang, Langson and Chapa in North Vietnam: mean, mean maximum and minimum, mean of the absolute maximum, mean of the absolute minimum, absolute maximum and absolute minimum temperatures; mean pressure, mean cloud amount given in numbers, mean total amount of precipitation, cumulative rainfall amount, number of days with rain, and surface winds by arrows.

98. Hubert, Henry Sur la circulation générale de l'air atmosphérique au-dessus de l'Indochine (On atmospheric circulation over Indochina). *Académie des Sciences, Comptes Rendus* 198:1055-1057. (In French). Paris, March 12, 1934. DWB P.

...From aerological observations taken at stations in Indochina the author analyzes the general circulation of air over that peninsula.

99. Morin, Henry G.S. and Carton, P. Contribution à l'étude de l'influence des facteurs climatiques sur la répartition de l'endémie palustre en Indochine (Contribution to the study of the influence of climatic factors on the distribution of endemic swamp diseases in Indochina). *Indochina. Service de la Statistique Générale, Bulletin Économique de l'Indochine*, N.S. 37:459-480. (In French). May-June 1934. DWB M/1730 M858.

...Discusses the effect of the tropics on the white man and the geographical distribution of the anopheles mosquito. The source also contains the following monthly data, summarized over a period: tabular mean and mean minimum temperatures for Lao-kay (26 years) and Lang-son (27 years); tabular and graphic presentation of mean and mean minimum temperatures for a station at an elevation of 600 m. in the Lao-kay region and at a station at an elevation of 600 m. in the Lang-son region based on data for an unspecified period; tabular (also presentation on climograms) mean temperature and mean relative humidity for Hanoi, Lang-son and Lao-kay based on data for specified periods which vary by station and element.

100. Theaman, John R. The wettest spots in the world. 139pp. Indianapolis, August 1934. DWB M/1210 T374w.

...On pages 129-131 gives some information on precipitation on the east coast of Annam and presents the greatest monthly amount of precipitation recorded at La-trong with date of occurrence.

1935

101. Agard, A. L'Union Indochinoise Française ou Indochine orientale. Régions naturelles et géographie économique (The French Indochinese Union or eastern Indochina. Natural regions and economic geography). 370pp. 1935. DLC HC442 .A6.

...Defines the natural regions of French Indochina and describes the climate of each of these regions. The author presents descriptive climatic data for Tonkin on pages 20 and 21 and North Annam on pages 26 and 27. Tonkin and part of North Annam constitute the area presently known as North Vietnam. This is a thesis submitted to the University of Montpellier.

102. Bruzon, E. La visibilité horizontale en Indochine (Horizontal visibility in Indochina). *Annales de Physique du Globe de la France d'Outre-Mer* 2(11):151-154. (In French). Paris, October 1935. DWB P.

...Describes the visibility in Indochina during the summer monsoon and the winter monsoon and presents notes on forecasting visibility.

103. Chochod, Louis Le climat indochinois et son influence sur la littérature populaire des annamites (Indochinese climate and its influence on the popular literature of the Annamites), *Société de Géographie de Lyon et de la Région Lyonnaise, Bulletin*, 1935. pp.35-44. Lyon, 1935. DLC G11 .S64.

...In reality there are four climates distributed over Indochina (Laos, Cambodia, North Vietnam and South Vietnam). The author discusses briefly these climates which are classified as Tonkin, Annamite, Cochinchinese and high plateau. A brief description of the wind is also given.

104. Hubert, Henry Généralités sur la visibilité horizontale aux colonies (Generalities on the visibility in the colonies). *Annales de Physique du Globe de la France d'Outre-Mer* 2(11):129-132, 141-146. (In French). Paris, October 1935. DWB P.

...Discusses the practical character of visibility, causes of the variation of visibility, measurement of visibility in the colonies, and maps of visibility.

105. Hubert, Henry Les mouvements généraux de l'air atmosphérique au-dessus des colonies françaises (The general air movement above some French colonies). *Annales de Physique de Globe de la France d'Outre-Mer*, 2(7,9): 1-27, 73-82. (In French). Paris, February and June 1935. DWB P.

Source No. 105 continued.

...Includes a description of the wind observations in Indochina on pages 23-26 and presents graphs showing the daily distribution of wind speed for Phu-Liên (1932 and 1933) and wind direction for Phu-Liên (1932 and 1933), Hanoi (1933), and Vinh (1933) at specified heights (0-50m.) for each 100-m. interval from 100-2000m., for each 200-m. interval from 2000-4000m., and for each 500-m. interval from 4000-10,000m.).

106. Hubert, Henry Les précipitations annuelles dans les territoires d'outre-mer de la zone intertropicale (The annual precipitation in the overseas territories of the intertropical zone). *Annales de Physique du Globe de la France d'Outre-Mer* 4(22,23):47-122, 129-133. (In French). Paris, August and October 1935. DWB P.

...The primary aim of this study is the comparison of data at stations in the intertropical zone to aid in solving such problems as flood control, irrigation, and navigation on rivers. The author discusses the purpose of the present work, the literature already known, the nature of the documents presented, the presentation of data received, information furnished by graphs and the influence of the geographical character on the distribution of precipitation. In addition to the textual data the source contains the following: tabular annual summaries year by year of precipitation amount for varying periods between 1908 and 1934 at 325 stations in North and South Vietnam; graphs of annual precipitation amounts for each year (1905-1935) for 55 stations in North and South Vietnam.

107. Reed, W.W. The distribution of precipitation over the earth. 165pp. Washington. DWB C/a R327.

...Includes tabular monthly and annual mean total amount (inches) of precipitation, summarized over specified periods for Moncay (27 years), Hagiang (11 years), Laokay (27 years), Hanoi (25 years), Phu Lien (20 years), and Vinh (26 years).

1936

108. Bruzon, E. La période du crachin sur les régions du golfe du Tonkin (The "crachin" season in the Gulf of Tonkin region). *Annales de Physique du Globe de la France d'Outre-Mer* 3(17):129-133, 139-142. (In French). Paris, October 1936. DWB P.

...Discusses the mean distribution of pressure in the Far East from October to April, the winds at the surface and in the upper air, the state of the sky, and the fogs and "crachin" for February and March over the Gulf of Tonkin regions; presents tabular mean and maximum number of days with crachin at 0600, 0800, 1000, 1400 and 1600 for February and March based on 6 years of data at Phu-Liên, Hanoi, Moncay, Thanh-hoa, Vinh, and Dong-hoi; includes graphs of visibility frequencies within limits (0-500m., 500-1000m., 1-2km, 2-4km, 4-10km, and >10km.) at 0600, 0800, 1000, 1400 and 1600 at Hanoi, Thanh Hoa, Vinh, and Dong-Hoi.

109. Shaw, Napier with the assistance of Elaine Austin Manual of meteorology. Volume II. Comparative meteorology. Second edition. 472 pp. Cambridge, 1936. DWB M 5537m.

Source No. 109 continued.

...On page 194 includes tabular monthly and annual mean total amount (mm) rainfall at Phu Lien based on data for an unspecified period.

1937

110. Frolow, V. La propagation des composantes météorologiques élémentaires en Indochine (Distribution of the principal meteorological elements in Indochina). Annales de Physique du Globe de la France d'Outre-Mer 4(23): 148-150, 153-156. (In French). Paris, October 1937. DWB P.

...Theoretical calculation of distribution of precipitation, temperature and pressure in Indochina, accompanied by some representative data and charts. -MAB 5B-162.

111. Great Britain. Meteorological Office Weather in the China Seas and the western part of the North Pacific Ocean. Volume II, Part 3. Central portion of the China Sea. pp.131-167. London, 1937. DWB M82/512.3 G786w.

...Discusses the general climatic conditions, typhoons, surface and upper winds, visibility, cloud, rain, hail, snow, air and sea temperatures, humidity, thunderstorms, squalls, waterspouts and tornadoes for the central portion of the China Sea (10°-20°N.) including the Gulf of Tongking, Hainan Island and the coasts of North and South Vietnam. The tables contain monthly and annual summaries over the period (7-27 years within the period 1907-1934) of mean pressure (mb.), daily amplitude of pressure, mean temperature (°F), mean and absolute extremes of temperature, mean relative humidity, mean cloud amount (0-10), mean amount and maximum amount in 24 hours of rainfall (mm.), mean number of days with rain, wind direction (8 points and calm) frequency (%), mean number of days with gales, mean number of days with fog, mean number of days with thunderstorms and visibility frequency within defined limits (0-1/2, 1/2-2, 2-5, 5-10 and >10 miles) at 0700 and 1300 local time at Phulien.

112. Indo-China. Inspection Générale des Travaux Publics Rapport sur les crues de 1937 au Tonkin et les enseignements qui peuvent en être tirés au sujet des moyens de protections contre les crues (Report on the floods of 1937 in Tonkin and information which may be derived for the protection against floods). 30pp. (In French). Hanoi, 1937. DLC TC513 J5A5.

...Gives information concerning the floods of 1937 in Tonkin and presents reports on rains in the Thai-Binh basin during the flood period in 1937 and for other critical periods. The source also compares numerical maximum rainfall amounts of day and of month in 1937 with the normal amounts at 13 different places in North Vietnam.

113. U.S.S.R. Agro-gidrometeorologicheskii Institut Mirovoi agro-klimaticheskii spravochnik (The world's agro-climatic handbook). 418pp. (In Russian). Leningrad-Moscow, 1937. DWB M82.2/47 U58m.

Source No. 113 continued.

...Includes the following tabular data, summarized over unspecified periods for stations in North Vietnam: mean temperature of the warmest month and the coldest month, annual absolute minimum temperature, annual mean number of days with temperature greater than specified degrees (5, 10, and 15°C.), annual mean amount of precipitation, maximum and minimum hydro-thermal coefficients, first and last dates with duration in days of drought period, and sum of temperature >10° with sufficient precipitation at Langson, Moncay, Hanoi, Phu-Lien and Vinh; first and last dates with duration in days of dry period at Langson and Hanoi; annual mean absolute minimum temperature and first and last dates of temperature >15°C. at Langson; monthly and annual mean temperature, mean amount of precipitation, mean amount of days with precipitation, and mean relative humidity at Langson.

1938

114. Depperman, Charles E. Typhoons originating in the China Sea. 51pp. Manila, 1938. DWB M15.2/5123 P552t.

...Enumerates possible causes of typhoons, presents information on some typhoons in the China Sea with illustrative daily weather maps, and discusses the typhoons originating in the China Sea. Some of the depressions and depressions becoming typhoons crossed over the China Sea into Indo-China.

115. Gherzi, E. Air masses acting over China and the adjoining seas. Beiträge zur Physik der freien Atmosphäre 24:45-52. Leipzig, 1938. DWB M(05) B422.

...Discusses the 4 main air streams influencing the weather of China and adjoining areas. These air streams include the Siberian, tropical Indo-Chinese and Tonking, trade wind, and the southwest Australian and Philippine.

116. Great Britain. Meteorological Office Weather in the China Seas and in the western part of the North Pacific Ocean. Volume I. Part 1. General information. Part 2. Typhoons. M.O. 404a. 165pp. and 45pp. respectively. London, 1938. DWB M82/512.3 G786w.

...Part 1 contains general information on orographic features and weather conditions, the normal distribution of pressure and its seasonal changes, surface wind, temporary disturbances of the monsoon winds-cyclonic depressions, gales and squalls, wind in the upper air, sea temperature and ocean currents, air temperature, rainfall, cloudiness, fog and visibility and thunderstorms for eastern Asia. The source includes tabular extremes of temperature with range at Phulien on page 105. Part 2 on typhoons presents textual information on the meaning of the word typhoon, warnings of approach and sequence of wind and weather, theories on the birth and death of tropical cyclones, zones of origin of typhoons, synoptic indication of formation, filling up of typhoons, danger areas and paths, movements of typhoons, height of typhoons, upper air currents in the vicinity of typhoons, and single observer forecasting.

117. Great Britain. Meteorological Office Weather in the China Seas in the western part of the North Pacific Ocean. Volume III. Aids to forecasting. M.O.404c. 170pp. London, 1938. DWB M82/512.3 G786w.

Source No. 117 continued.

...Discusses briefly the principal air-masses encountered over eastern Asia and the western portion of the North Pacific Ocean, includes some general information on forecasting in regions north of the parallel 25°N., and presents synoptic maps illustrating conditions which give rise to a particular sequence of weather within a limited area.

118. Guilmet, B. and Lemasson, J. Étude préliminaire sur la température des eaux closes et son influence sur la biologie de la carpe au Tonkin (Preliminary study on the temperature of enclosed waters and its influence on the biology of the carp in Tonkin). Bulletin Économique de l'Indochine 41:1126-1133. Hanoi, 1938. DLC HC441 .A4.

...Includes tables with monthly and annual summaries over the period for Phu-ho (1934-1936) of mean air temperature, mean extreme air temperatures with departures, mean air temperature at 0600, 0800, 1000, 1200, 1400, 1600 and 1800; mean extreme water temperatures with departures and mean water temperature at depths of 0.5, 0.15, 0.30, 0.50, 0.70 and 1.00; mean water temperatures at depths of 3, 15, 30 and 45 cm. at 0600, 0800, 1000, 1200, 1400, 1600 and 1800.

119. Japan. Imperial Marine Observatory Daily weather charts of the North Pacific Ocean. January 1923-March 1938. Kobe. DWB.

...Presents observations at 1000 of pressure, temperature in °C., wind direction and force (0-12) and weather at Phu-Lien January 1923-March 1938).

1939

120. Charlet,- Sur la vitesse du vent dans les colonies françaises (On the wind speed in the French Colonies). Annales de Physique du Globe de la France d'Outre-Mer 6(31):20, 27-31. (In French). Paris, February 1939. DWB P.

...Consists of explanatory notes concerning wind speed in the French Colonies and a table showing the frequency of wind speed  $\leq 3$  mps and  $\geq 7$  mps for individual stations in these colonies. These stations include Dong-Hoi, Than-Hoa, Vinh, Hanoi, Lao-Kay and Phu-Lien.

121. Iyer, V. Doraiswamy Typhoons and Indian weather. India Meteorological Department, Memoirs XXVI (VI):93-130. Delhi, 1939. DWB M(055) I39m.

...Examines the typhoons of the Pacific Ocean and the China Seas which moved westward and struck the coast of Indo-China or south China during the period 1884 to 1930. A brief description of each of these typhoons which affected Indian weather is given.

122. Lu, Alfred The monthly pressure distribution and the surface winds in the Far East. Memoir of the National Research Institute of Meteorology, Academia Sinica 12(4):1-25. Chungking, 1939. DWB M(055) A168m.

Source No. 122 continued.

...Includes tabular monthly and annual summaries over the period (1921-1930) of mean sea level pressure at Phulien.

123. Zi-Ka-Wei Observatory Daily weather charts. July 1906-August 1939. DWB.

...Contains observations at a specified hour (varies-usually at 1600, 1700 or 1400) of pressure, temperature and wind direction and force and 24-hour variations of pressure and temperature at Phu-lien for 1906-1938.

1940

124. Carton, P. Le climat de l'Indochine (The climate of Indochina). Le Climat de l'Indochine et les typhons de la Mer de Chine I:1-211. (In French). Hanoi, 1940. DWB M82/596 B914 cl.

...Describes the network of stations in the Indochinese Meteorological Service; instruments installed at the Indochinese stations; location and geographical characteristics of Indochina; general climatic conditions in Indochina; pressure and wind regimes, temperature, precipitation regime, humidity, dew, morning fog, sunshine, cloudiness, and atmospheric disturbances in Indochina; the climate of Indochina from the point of view of the classification of climates; the influence of climate on forest and vegetation in general in Indochina. The source also contains graphs and tabular summaries for individual stations in Indochina. The tabular monthly and annual summaries include the following for stations in North Vietnam based on data for specified periods (vary by station and element but within the period 1907-1938): mean wind speed (kph and mps), extreme means with years of occurrence of wind speed (kph and mps), and mean hours of extreme temperatures at Phu-liên; normal mean temperature with monthly and annual departures from the normal for each year (1907-1938) at Hanoi; mean, maximum and minimum duration (hours) of sunshine and mean, maximum and minimum daily duration (hours) of sunshine at Phu-liên, Hanoi, Phu-ho, Vinh, and Dong-hoi; mean total and mean daily amount (mm.) of evaporation at 18 stations; mean temperature (°C), mean extremes with range and absolute extremes with range of temperature (°C), mean total amount of rain (mm.), number of days with rain, extreme amounts (mm.) with years of occurrence of rain, mean relative humidity, mean extreme relative humidities, and absolute minimum relative humidity at Hanoi, Phu-liên, Phu-ho, Lao-kay, Chapa, Lang-son, Thanh-hoa, Vinh, Phu-qui and Dong-hoi; prevailing wind direction at Hanoi, Phu-liên, Phu-ho, Lao-Kay, Lang-son, Thanh-hoa, Vinh, Phu-qui and Dong-hoi; mean vapor pressure (mm.) at Phu-liên and Hanoi; mean cloud amount (0-10) at 11 stations; maximum and minimum amounts (0-10) of cloudiness with years of occurrence at Phu-liên; maximum and minimum amounts of evaporation (mm.) with years of occurrence at Phu-liên; saturation deficit and number of days with fog and crachin at Phu-lien; evaporation frequency within specified limits (0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, and 9-10 mm.) at Phu-liên; normal mean total rainfall amount with monthly and annual departures from the normal for each year (1907-1938) at Hanoi.

125. Depperman, Charles E. Upper air circulation (1-6 km.) over the Philippines and adjacent regions. 85pp. Manila, 1940. DWB M57/914 P552u.

Source No. 125 continued.

...Analyzes kinematically the upper air circulation for 1-6 km. for each month for an area extending eastward from Burma to Guam and New Guinea and extending northward from northern Australia to northern Formosa; discusses the main air streams, which are northerly of the Asiatic coast, North Pacific trade, temperate zone westerlies, North Indian Ocean westerlies, South Indian Ocean westerlies, and South Pacific trade.

126. Indo-China. Service Météorologique Annales (Yearbooks). 1928-1939. (In French). Hanoi, 1930-1940. DWB C/ed AO-a.

...Describes the Indochinese climatological network, the typhoons, the climatic conditions and the influence of meteoric factors on the agriculture in Tonkin, Annam, Cochinchina, Laos and Cambodia for individual years during the period 1928-1935; lists the stations with elevations and coordinates for each year 1928-1939; in the 1928 volume lists the instruments installed at meteorological, climatological, agricultural and precipitation stations in Indochina. The tables present for 8-187 stations in North Vietnam monthly and annual summaries for each year (within the period 1928-1939) of pressure (mean, absolute extremes, 1st and 2nd mean extremes, mean ranges for day and night, and means at 0600, 0800, 1000, 1400, and 1600), temperature (mean, mean extremes and absolute extremes), mean cloud amount (0-10), relative humidity (mean, mean extremes, and absolute extremes), mean wind force (Beaufort), evaporation (total, daily mean and daily maximum), mean daily duration of sunshine, mean vapor pressure in mb. and rainfall (total amount during day, during night and in 24 hours in mm.; total number of days; maximum amount in 24 hours in mm.) In addition to the above elements there are various computed monthly and annual summaries (including bihourly means of some elements) of pressure, temperature, temperature at 0.10 and 10cm above a grassy surface, temperature at a depth of 15cm, visibility frequency, cloud amount, days with various phenomena, wind, solar radiation and rainfall at the Central Observatory (Phu-Liên). There are also summaries over the period (vary by station and element) for 8-187 stations of monthly and annual temperature (mean, mean extremes and absolute extremes), rainfall (mean total amount, extreme amounts with years of occurrence, maximum amount in 24 hours and number of rainy days), evaporation (mean total and daily mean), mean cloud amount and relative humidity (mean and absolute minimum).

127. Indochina. Service Météorologique Bulletin mensuel (Monthly bulletin). 1927-1930, January 1937-October 1940. Hanoi. DWB M06.1/596 I41bu.

...Presents daily data with monthly summaries for Phu-Liên (1927-1930) of first and second maximum and minimum pressures and night and day pressure ranges, maximum and minimum temperatures with range, mean and extreme temperatures with range at 0.10 m above the grass, mean and extreme relative humidities with range, mean soil temperature at depths of 0.50 and 0.15 m, total evaporation, total evaporation for day and night, total amount and duration of precipitation, total amount and duration of precipitation for day and night, total wind speed and total wind movement, duration of sunshine, mean cloud amount, and mean visibility; total cloud amount and

Source No. 127 continued.

form and direction of low and high clouds at specified hours (0600, 0800, 1000, 1200, 1400, 1600 and 1800), visibility (km) and intensity of solar radiation at specified hours (0800, 1000, 1200, 1400, and 1600); daily weather remarks at Phu-Liên (1927-1930); daily data with monthly summaries for Phu-Liên of mean and extreme temperatures with range at 0.30 m above the grass and extreme soil temperatures with range at depths of 0.15 and 0.50 m at Phu-Liên for 1930; various computed monthly values for Phu-Liên (1927-1930). There are also tabular monthly summaries for each year (number of years varies but during the period 1927-1930, January 1937-October 1940) of mean, first and second mean maximum and minimum and absolute maximum and minimum pressures; means at specified hours (vary by element) of pressure, temperature, relative humidity, vapor pressure, wind speed frequency within limits ( $\leq$ , 6-25, 26-50, 51-75 and  $>75$  kph) by direction (16 points), total cloud frequency (0-3, 4-6, 7-9 and 10 tenths), low cloud frequency (0-3, 4-6, 7-9 and 10 tenths), ceiling frequency within defined limits (0-50, 50-100, 100-200, 200-300, 300-600, 600-1000, 1000-1500, 1500-2000, 2000-2500m and no low clouds), visibility within specified ranges, mean wind force by direction, maximum wind force by direction, low cloud frequency (4-6, 7-9 and 10 tenths) when cloud height is within defined limits ( $<300$ ,  $<1000$  and  $>1000$ m), mean cloud amount, number of days with ceiling  $<300$ m, number of days with fog  $<1$ km, mean wind speed and prevailing wind direction; mean, mean maximum and minimum and absolute maximum and minimum temperatures and relative humidities; mean vapor pressure; total, daily mean and daily extreme durations of sunshine; total amount and 24-hour maximum amount of rainfall; prevailing wind direction; mean wind force; wind force frequency (1, 2-4, 5-6, and  $>6$  Beaufort) by direction (8 points and calm); number of days with miscellaneous phenomena (rain, crachin, dew, hail, morning fog, thunderstorms and gales); number of clear and cloudy days; wind speed frequency within defined limits ( $\leq$ , 6-25, 26-50, 51-75 and  $>75$  kph) by direction at heights of 500, 1000, 2000, 3000, 4000, 5000 and 6000m; miscellaneous computed values for various elements. For each month (January-October) in the volume containing data for 1940 there are summaries over the period (varies by station) of absolute maximum and minimum pressures and temperatures, absolute minimum relative humidity, monthly maximum and minimum amounts of rain and maximum amount of rainfall in 24 hours. These data are recorded for approximately 1-68 stations in North Vietnam. In addition to the tabular summaries the source contains descriptive weather information for Indochina for each month January 1938-October 1940.

128. Taiwan (Formosa). Weather Bureau Meteorological reports for Indo China and the South Seas, January 1936-July 1940. (In Japanese). Taihoku. DWB M06.1/596 T135m.

...Consists of synoptic observations (0700 and 1500 for 1936, 0600 and 1400 for 1937, 0800 and 1600 for 1938, 0900 and 1500 for January-May 1939 and 0900 and 1800 for June 1939-July 1940) of pressure, wind direction and force, state of weather and temperature in  $^{\circ}$ C for individual stations. These stations include Phulien, Dong-Hoi, Hanoi, Vinh, Lao-Kay, Moncay, Lang-Son, Thanh-Hoa and Nam-Dinh in North Vietnam.

129. Taiwan (Formosa). Weather Bureau Report of pilot balloon observations in the Philippines and French Indo-China, October 1936-July 1940. (In Japanese). Taihoku. DWB M06.7/914 T135r.

...Consists of 1-2 pilot balloon observations (wind direction and speed) at levels of 200, 500, 1000, 1500, 2000, 3000, 4000, 5000 and 6000m. for individual stations. These stations include Phulien, Hanoi, and Vinh. Observations are irregular.

130. Thailand. Meteorological Department Annual meteorological bulletin. Vol. 3 and 4. 1939-1940. (In Thai and English). Bangkok. DWB M06.1/593 T364a.

...Presents tabular monthly (April 1939-December 1940) frequency of depressions in Indochina.

131. Vietnam. Service Météorologique Indochine; observations météorologiques (Indochina; meteorological observations). October 1940. (In French). DWB M09.2/596 V666in.

...Consists of coded data observed at 0700, 1000, and 1300 for individual stations in Indochina (12 stations in North Vietnam) for October 1-9, 17 and 30, 1940. The following code is used: IIIC<sub>L</sub>C<sub>M</sub> WWVhN<sub>h</sub> DDFWN PPPTT UURRt<sub>w</sub>. The source also presents aerological observations (1 per day) of height and wind direction and speed for 1-3 stations (Hanoi, Phu-liên, and Vinh) in North Vietnam for October 1-9, 17 and 30, 1940.

1941 - 1950

1941

132. Japan. Hydrographic Office Appendix to military weather. Vol. 4. French Indochina, Burma, Malaya, Netherlands. Weather tables. 92pp. (In Japanese). April 1941. DN-HO QC994.61 Japan No. 433.

...Presents tabular monthly and annual summaries over the period (varies by station and element) for 1-23 stations in North Vietnam of mean pressure, mean temperature, mean and absolute extreme temperatures, mean and minimum relative humidities, mean total amount of precipitation, maximum precipitation in 24 hours, mean cloud amount, mean wind speed, prevailing wind direction, maximum wind speed with direction, mean number of days with miscellaneous phenomena (rain, gales, fog, thunder and lightning, smoke and fog and no sunshine).

133. Japanese Hydrographic Office China Sea pilot, Vol. I. (In Japanese). 1941. DN-HO Jap VK 905 C.S. I.1941.

...Contains a table with monthly and annual summaries over the period (27 years, 1904-1933) at Phu Lien of mean pressure, mean temperature, mean and absolute extreme temperatures, mean relative humidity, mean cloud amount, mean total amount of precipitation, mean number of days with precipitation, maximum amount of precipitation, wind direction frequency, mean number of days with fog and mean number of days with gales.

134. Knoll, Denys W. Climatology. Asiatic station. 97 pp. Washington, 1941. DWB M82.2/5 K72c.

...Reports climatological data along the eastern Asiatic coast to permit limited weather forecasts without the use of weather maps since routine weather reports and bulletins were not made available by the belligerent nations. The data include the following 10-day summaries over an unspecified period for Fulien (Phulien): mean pressure; maximum and minimum temperatures; prevailing wind direction and mean wind speed (knots); mean number of clear, partly cloudy, and cloudy days; mean number of days with rain and fog; flying conditions (average or better); mean number of typhoons affecting the area; mean total rainfall amount (inches).

135. Reed, Wesley W. The climates of the world. Climate and Man, Yearbook of Agriculture, 1941. pp. 665-684. Washington. DWB M82 R327c1.

...Records the following tabular summaries over specified periods for Hanoi: mean temperatures (20 years) in °F for January, April, July, and October; annual extreme temperatures (35 years) in °F; monthly and annual mean amount (inches) of precipitation (25 years).

136. Taiwan (Formosa). Meteorological Observatory Monthly meteorological report for the southern regions. March-May, July-December 1941. (In Japanese). Taihoku, March 1941-January 1942. DWB M06.1/529 T135mo.

Source No. 136 continued

...Includes daily observations at 0900 and 1800 of pressure, temperature, wind direction and force, state of weather, visibility, relative humidity, total cloud amount, lower cloud type, lower cloud amount and height, middle cloud type, past weather and remarks. There are also some scattered upper wind (direction and force) observations (1-2 per day) at specified heights. These data are for 2-10 stations (Laokay, Lang-Son, Moncay, Hanoi, Gowtow, Phu-Lien, Nam-Dinh, Thanh-Hoa, Vinh and Dong-Hoi) in North Vietnam.

137. Taiwan (Formosa). Weather Bureau Flight weather report for French Indo-China, Thailand and Dutch East Indies. Volumes 1 and 2. (In Japanese). Taihoku, January 1941. DWB M82.2/596 T 135f.

...Presents tables with monthly and annual summaries over specified periods (vary by station and element) of mean pressure, mean temperature, mean extreme temperatures, absolute extreme temperatures, mean relative humidity, mean cloud amount, prevailing wind direction, mean total amount of precipitation and mean number of days with precipitation in Volume One. Volume Two contains numerical monthly and annual summaries over unspecified periods of mean wind speed at 0900 and 1500; mean total cloud amount at 0900 and 1500; mean low cloud amount at 0900 and 1500; low cloud height at 0900 and 1500; number of days at 0900 and 1500 with clear skies, scattered clouds, broken clouds, overcast skies, haze, fog and thunderstorms; visibility at 0900 and 1500. The source records data for 8-9 stations in North Vietnam (Laokay, Lang-Son, Moncay, Hanoi, Phu-Lien, Haiphong, Nam-Dinh, Thanh-Hoa, Vinh and Dong-Hoi).

1942

138. Blair, Thomas Arthur Climatology, general and regional. 484pp. New York, 1942. DWB M8 B635cl.

...In Chapter XVI briefly describes the climate of Annam on page 320 and Siam (Thailand) and Indo-China on pages 325 and 326.

139. Myers, Robert and Nuber, John The climate of Indo Chinese and Malayan Peninsulas. California Institute of Technology, Pasadena, Military Climatology, Vol. I. 10pp. Pasadena, 1942. DWB M82 C153mi.

...Describes the geography and the climate in general of the Indo Chinese and the Malayan Peninsula. The source also presents a graph showing the monthly values of mean total rainfall amount (in.) for Laokay based on data summarized over an unspecified period.

140. Navarrete, Julio Bustos Diversos trabajos meteorológicos realizados por el Observatorio del Salto (Different meteorological works undertaken by the Salto Observatory). American Meteorological Society, Bulletin 23:395-408. (In Spanish). Milton, Massachusetts, 1942. DWB M(05) A512b.

...On pages 402-404 discusses briefly the variation of solar radiation of the atmospheric circulation of the Pacific and the relation between the meteorological regime of Indochina and Chile.

141. U. S. Army Air Forces Climate and weather of southeastern Asia. Part I. India, Burma, and southern China. Publications of the Weather Research Center V (3):1-129. Washington, 1942. DWB M82 U58p.

...Presents tabular monthly and annual mean number of days with thunderstorms summarized over an unspecified period at Hanoi.

142. U. S. Weather Bureau Southeastern Asia, India, Farther India and the East Indies. P.R. 5. 236 pp. Washington, 1942. DWB M82 U587p.

...Discusses the climate and weather of Farther India (Andaman Islands, Thailand, Indo-China, and Malaya) on pages 135-181. This includes information on topography, climatic influences, surface winds, upper winds, cyclonic and local storms, thunderstorms, cloud amount, ceilings, fog, visibility, precipitation and temperature. On pages 182-185 there are notes on the topography, surface winds, temperature, precipitation, diurnal variation of rainfall, thunderstorms, visibility, cloudiness, ceilings, and fog for Hanoi. The source also presents the following summaries over unspecified periods for stations in North Vietnam: monthly and annual mean wind speed (mph) and mean maximum and minimum wind speeds with years of occurrence at Phu-Lien; monthly and annual mean, mean maximum and minimum, and absolute maximum and minimum temperatures (°F) at Hanoi; monthly and annual mean rainfall amount (inches), mean number of days with rain and maximum and minimum amounts (inches) of rain with years of occurrence at Hanoi; monthly and annual mean number of days with thunderstorms within a radius of 60 to 75 miles from the Central Observatory at Phu-Lien; monthly and annual mean cloud amount (0-10) and mean number of days with fog at the Central Observatory; monthly and annual mean number of days with thunderstorms and mean number of days with rain (0.1mm) at Hanoi; monthly and seasonal mean temperature (°F), mean amount of precipitation (inches), mean number of days with precipitation, mean number of days with fog, mean number of days with gales, mean number of days with thunderstorms, mean relative humidity, mean cloud amount (0-10) and prevailing wind direction for 1-3 stations (Hanoi, Phu Lien, and Vinh); seasonal absolute extreme temperatures for Hanoi, Phu Lien and Vinh; monthly and annual mean cloud amount (%) for Hanoi and Phu Lien. In addition to the tabular summaries over the period there are monthly summaries for each year (1937, 1940) for A.M. and for P.M. of: total number of days with the height of the base of low clouds <300, <600, and <1000 meters for Moncay, Gowtow, Hanoi, Vinh, Sonla and Lao Kay; total number of days with visibility <1km for Moncay, Gowtow, Hanoi, Vinh, Laokay and Sonla.

1943

143. Angel, Edgar P. Air masses of eastern Asia. 5 pp. Pasadena, August 1943. DWB M15.8 A581a.

...Discusses briefly the air masses in eastern and southeastern Asia, which includes Indochina, and describes the changes in the general circulation pattern. This is a thesis written in partial fulfillment of the requirements for a degree of Master of Science in Meteorology at the California Institute of Technology.

144. Frankel, M.H. Climatic statistics for selected stations in French Indo-China and Thailand. U. S. Weather Bureau, Special Report No. 252. April 1943. DWB M82.2 U587s.

...Includes the following tabular monthly and annual summaries usually over specified periods (vary by station and element) for Chapa, Hanoi, Phu Lien, and Vinh: mean, mean daily extreme, and absolute extreme temperatures ( $^{\circ}\text{F}$ ); mean amount, and maximum and minimum amounts of precipitation (in.); maximum amount of precipitation (in.) in 24 hours for Hanoi, Phu Lien, and Vinh; mean snowfall amount and depth of snow on ground in inches; mean relative humidity; mean relative humidity at 1000 and 1600 for Phu Lien and Vinh; mean cloud amount (0-10); mean cloud amount at 1000 and 1600; mean wind speed (m.p.h.); maximum wind speed for Phu Lien; prevailing wind direction (8 pts.) for Hanoi, Phu Lien, and Vinh; dates of first and last frost and snow; mean number of days with minimum temperature  $\leq 32^{\circ}\text{F}$ ., snowfall, and snow cover; mean number of days with precipitation for Chapa and Vinh; mean number of days with precipitation  $\geq T$  for Hanoi and Phu Lien; mean number of days with gales, thunderstorms, and fog at Hanoi and Phu Lien.

145. Germany. Oberkommando der Kriegsmarine Handbuch für das Südchinesische Meer (Handbook of the South China Sea). Dritte auflage. 674 pp. (In German). Berlin, 1943. DN-HO Ger VK 905 s 1943.

...Includes summaries over the period of monthly mean temperatures ( $^{\circ}\text{C}$ ) with annual departures for Phu Lien (1907-1929), monthly mean pressure (mb) with annual departures for Phu Lien (27 years), seasonal wind direction frequency for Phu Lien (1907-1933), monthly and annual mean total rainfall amount (mm) and mean number of days with rain for Phu Lien (1907-1929) and monthly mean number of days with fog at Phu Lien (27 years).

146. India. Meteorological Department India's climates - Summary for airmen (Summaries of climates of Afghanistan, Persia, Ceylon, Burma, Siam and Indo-China are also appended) 49 pp. Poona, 1943. DWB M82.1/54 I381.

...In appendix IV presents the general features of the climate of Siam and Indochina. The source also contains descriptive information on the state of the sky, rainfall and number of rainy days, number of days with thunder and duststorms, visibility, fog, haze, surface winds and upper winds for Tong-King for each season (December-March, April-May, June-September, and October-November).

147. Miller, L.C. Flying conditions in Indo China. U. S. Weather Bureau, Special Report No. 313. 68 pp. 1943. DWB M82.2 U587s.

...Consists of textual information on the climate of Indochina, tabular climatic summaries for individual stations and climatic maps of the area. The descriptive data include information on Indochina, as follows: location, topography, climatic effects of relief, vegetation, climatic controls, typhoons, winds, cloudiness, ceiling heights, visibility, the "Crachin", rainfall, thunderstorms, temperature, and icing. The source also contains the following tabular data for stations in North Vietnam: monthly and annual summaries over a 23-year period of mean cloud amount (0-10) at Haiphong, Phu-lien, Vinh, Hanoi, Lao-Kay, and Dong Hoi; monthly maximum and minimum cloud amount (0-10) at Phu-lien

Source No. 147 continued

based on 23 years of data; monthly summaries for each year (1937, 1940) of mean number of days with the height of the low cloud base <300, <600 and <1000 meters in the A.M. and in the P.M. at Moncay, Gowtow, Hanoi, Vinh, Lao Kay, and Sonla; monthly summaries for each year (1937, 1940) of mean number of days with visibility <1 kilometer in the A.M. and in the P.M. at Moncay, Gowtow, Hanoi, Vinh, Lao Kay, and Sonla; monthly and annual summaries over an unspecified period of number of days with fog at Phu-lien and Hanoi; monthly and annual summaries over an unspecified period of total amount (in.) of rainfall, maximum and minimum amounts of rainfall and number of days with rainfall for Haiphong; monthly and annual summaries over an unspecified period of number of days with thunderstorms at Hanoi and Phulien; monthly mean and absolute extreme temperatures for Hanoi, Haiphong, and Vinh based on data for an unspecified period; monthly mean extreme temperatures based on data for an unspecified period for Hanoi, Haiphong, Vinh, Lao-kay, Lang-son, Moncay, Thanh-hoa, and Dong-hoi.

148. Miller, L. C. Hainan Island - A climatic report. U. S. Weather Bureau, Special Report No. 312. 10 pp. July 1943. DWB M82.2 U587s.

...Is a report on the climate of Hainan Island with tabular summaries for the island supplemented by stations in Indochina. The tabular data summarized over an unspecified period, for Indochina include monthly and annual mean cloud amounts at Haiphong and mean number of days with thunderstorms at Phulien.

149. Russier, Henri L'Indochine française (French Indochina). Dix-neuvième édition. Hanoi, 1943. DLC DS534.R8.

...On page 7 describes the climate of Indochina by giving information on the temperature, winds, and monsoons on this peninsula.

150. U. S. Army Air Forces Climate of Hanoi (French Indo-China). General climatic Information Guide No. 89. Washington, December 1943. DWB M82.1 U58g.

...Describes the topography of the area of North Vietnam around the Gulf of Tonkin, and presents information on Hanoi, its representative station; discusses briefly the air masses, temperature, precipitation, cloudiness, fog and visibilities, and wind of the area; includes textual information on a comparable U. S. station, which is Sanford, Florida; presents maps showing the topography and the soil trafficability of the area; gives military implications of climatic conditions for air and ground operations; contains graphs of climatic data for Hanoi. These graphs, which are based on data summarized over specified periods (vary by element), present the following: monthly mean, mean extreme, and absolute extreme temperatures (°F); monthly mean dew point temperature (°F); monthly mean number of days with maximum temperature >90°F. and mean number of days with minimum temperature <70°F.; monthly mean amount, maximum and minimum amounts, and maximum amount in 24 hours of precipitation (in.); monthly mean, maximum and minimum number of days with precipitation; monthly precipitation spells (% of cases) within specified periods (1-2, 3-6, and ≥ 7 consecutive

Source No. 150 continued

days with precipitation); monthly maximum and mean number of days with wet soil (estimated); monthly number of clear (<2/10 sky cover) and cloudy (>8/10 sky cover) days; monthly mean, maximum and minimum number of days with ceiling <1000 ft. and/or visibility <1 1/4 miles; monthly wind speed frequency (%) within limits (calm, 1-7, 8-18, 19-31, and  $\geq$ 32 mph); seasonal surface wind roses.

151. U. S. Department of the Air Force Storm tracks and intensities over southeast Asia. Air Weather Service, Special Study No. 15. 2 pp. June 1943. DWB M(055) U58s.

...Shows the seasonal results obtained from examining the paths of actual low centers and frontal waves in 1937 and the number of lows at all possible points in the area for a period of 6-9 years. This area includes northern Indo-China.

152. U. S. Department of the Air Force Weather and climate of China. Air Weather Service, Technical Report No. 105-34, Parts A-C. March 1945. DWB M(055) U58a.

...Includes in Part A the following tabular summaries over the period for stations in North Vietnam: monthly, seasonal, and annual mean amount (inches) of precipitation for Shapa (11 years); monthly, seasonal and annual mean number of days with thunderstorms based on data for an unspecified period for Hanoi; monthly and annual wind direction (8 points and calm) frequency (%) at Phulien (27 years); monthly, seasonal and annual mean number of days with gales, mean number of days with precipitation, mean amount of precipitation (inches), mean relative humidity, mean cloud amount (%), mean number of days with fog, and mean temperature at Phulien (27 years); monthly, seasonal and annual mean number of days with thunderstorms at Phulien (7 years); monthly and annual maximum amount of precipitation in 24 hours, absolute maximum and minimum temperatures, mean monthly maximum and minimum temperatures and mean daily maximum and minimum temperatures for Phulien (27 years). In Part B the source contains monthly summaries over the period (1-2 years) at 0600 and 1400 at Moncay of wind force (0-9 Beaufort) by direction (16 points and calm), wind direction (16 points and calm) frequency, mean wind force (Beaufort), frequency of days particularly favorable for incendiary bombing operations, frequency of days favorable for parachute operations, and frequency of days favorable for amphibious operations. In Part C there is textual information on synoptic conditions in China and Manchuria with illustrative maps, which include Indochina north of 15°N.

153. U. S. Department of the Air Force Weather conditions affecting the target area of Indo-China, Thailand, Burma, Malay States, and occupied southern China. Air Weather Service, Special Study No. 16. 10 pp. November 1943. DWB M(055) U58s.

...Describes the seasonal (winter, transition period from winter to summer, summer and transition period from summer to winter) synoptic conditions affecting the target area of Indo-China, Thailand, Burma, Malay States and occupied southern China; discusses the typhoons in the area; gives vertical cross sections of the atmosphere taken along routes chosen to typify the distribution of elements during the 2 monsoon seasons (includes vertical cross section from Akyab to Hong Kong).

154. U. S. Hydrographic Office Strategic aerological surveys. Part II. Pacific and Indian Ocean areas. Washington, 1943. DWB M82/26 U58s.

...In Survey No. 120 presents the following on graphs with numerical values: monthly mean relative humidity (%), % of days with rain, mean total rainfall amount (inches), and mean temperature (°F) for Hanoi, Phulien, Vinh and Dong Hoi; monthly % of days with slight or no swell for Phulien, Vinh and Dong Hoi; monthly mean cloud amount (%), % of occurrences of gales, and % of occurrences of fog for Hanoi and Phulien. The source also contains monthly prevailing wind direction (8 points) for Hanoi, Phulien, Vinh and Dong Hoi; numerical monthly mean number of days with thunderstorms for Phulien; numerical monthly mean pressure (mbs.) for Hanoi and Phulien.

1944

155. Gherzi, Ernest, Zikawei Observatory Climatological atlas of east Asia. 175pp. Shanghai, 1944. DWB M82.3/5 Z68.

...Includes tabular summaries over specified periods (vary by station and element) of monthly and annual mean temperature, annual absolute extreme temperatures with dates and range, annual temperature range, monthly and annual mean relative humidity, monthly and annual mean total rainfall amount, monthly and annual mean number of rainy days ( $\geq 0.2$  mm), monthly and annual mean pressure and monthly and annual prevailing wind direction at 5-21 stations in North Vietnam. This source also contains notes on tropical cyclones or typhoons and the main air masses prevailing over east Asia.

156. Great Britain. Meteorological Office Rainfall maps of the Far East. M.O.M. 471. London, 1944. DWB M82.3/5 G786r Oversize.

...Presents a table with mean total amounts, maximum and minimum amounts and probabilities of rainfall for the wettest month (August) and driest (January) month at Laokay.

157. Hare, F. K. The crachin. Synoptic Divisions Technical Memorandum No. 87 of Great Britain Meteorological Office. 7pp. 1944. DWB M(055) G786s.

...Defines crachin, discusses the time and place of the occurrence of crachin, describes the three distinct classes of crachin, and presents illustrative charts. Crachin is mainly a phenomena along the coasts of China and Indo-China, however, in some instances it does penetrate inland. Crachin does not occur over the inland lowlands of Indo-China.

158. Haurwitz, Bernhard and Austin, James M. Climatology. First edition. 410pp. New York, 1944. DWB M8 H375c.

...Discusses the climatology of Asia (including Russia) in Chapter XII. This Chapter contains the following tabular data, summarized over an unspecified period for Hanoi: wind direction (8 points) frequency (%) for January and July; mean temperature (°F.), mean precipitation amount

Source No. 158 continued

(inches), and mean cloud amount (tenths) for January, April, July and October.

159. McIntosh, D. H. Tropical weather forecasting, with particular reference to N. E. India, Burma and the Bay of Bengal. Synoptic Divisions Technical Memorandum No. 123, pt. 3 of Great Britain Meteorological Office. 1944. DWB M(055) G786s.

...Discusses the seasonal trend of weather for the tropical areas of India and southeast Asia; summarizes briefly for each season (winter or N.E. monsoon, pre-monsoon, S.W. monsoon and post monsoon) the normal air flow, flying dangers, and forecasting problems of the area; presents illustrative maps of India and southeast Asia.

160. U. S. Department of the Air Force Forecasting and related problems in China. Air Weather Service, Technical Report No. 105-32. 25pp. December 1944. DWB M(055) U58a.

...On pages 22-25 includes information on French Indochina in the report on the southern extent of the China haze. This haze, which would more nearly correspond to the definition of mist, may limit visibilities in southwest China, the Gulf of Tonking, northern French Indo-China, Thailand, and Burma. The source contains descriptive data obtained from observations taken on bombing missions from February to about June 1 in 1944.

161. U. S. Weather Bureau Tropospheric weather factors likely to affect super-refraction of VHF-SHF radio propagation as applied to the tropical Western Pacific. Report RP-1. 100pp. Washington, July 1944. DWB M82.1/91 U587tr.

...Presents information on the meteorological characteristics of the tropical Western Pacific, various types of normal inversions in the atmosphere and their associated modified refractive index or M curves, factors (showers, winds, hurricanes, etc.) which disrupt the normal inversion in this area and basic relationship between weather factors and modified index curves. The tropical Western Pacific area includes North Vietnam.

162. Dobby, E. H. G. Winds and fronts over southeast Asia. Geographical Review XXXV:204-218. New York, 1945. DWB P.

...Describes the average movement of air in southeast Asia for each month; discusses the doldrum belt as a front; analyzes the seasonal air streams; presents the relation between the intertropical front and the tropical cyclones.

163. Fletcher, Robert D. Lecture notes on climate and weather of southeast Asia. 12pp. September 1945. DWB M15.8 F6141a.

...Discusses the climate of the general circulation zones, seasonal changes in the general circulation, and the effects of orography and of zonal current perturbations on the general circulation of southeast Asia.

164. Great Britain. Meteorological Office Meteorological report on China, Japan and adjacent areas. Aviation Met. Report No. 24., M.O.M. 365/24. 18pp. 1945. DWB M82 G786.

Source No. 164 continued

...Gives an account of the synoptic climate of Greater China, Japan and surrounding areas; presents information on the controls of climate by brief notes on the (1) influence of relief on synoptic climate, (2) latitude, and (3) disposition of land and sea; describes the nature of the climates and the seasons; includes information on typhoons and air-mass analysis.

165. Theaman, John R. Record rainfalls of Indo-Chine. Excessive 24-hour rainfalls of 12 inches or more. Publication Number 20. Indianapolis, November 1945. DWB M77.37/596 T374r.

...Lists excessive 24-hour rainfall amounts of 12 inches or more with dates of occurrence for stations in Indochina (38 stations in North Vietnam) where rainfall was measured regularly; amount and intensities of rainfall at Phu-Lien; a few of the heaviest rainfalls exceeding 70 inches in a single month with month and year of occurrence at Indochinese stations (Latrong in North Vietnam); the total amount of rainfall during a prolonged rainy period (total for each month in the period and for the entire period) at individual Indochinese stations (Dienbienphu and Tamdao in North Vietnam).

166. U. S. Navy Department Climatology and oceanography of operational areas of the western Pacific. Volume II. Climate of representative places. CINCPAC-CINCPHA. Bulletin No. 4-45. 150pp. March 1945. DWB M82.2/5 U58c.

...Presents explanatory notes on the various items in the source and records tabular monthly and annual summaries over unspecified periods for Hanoi. These summaries include the following: mean temperature (°F.); mean total amount of precipitation (inches); number of days with precipitation, intertropical fronts over area, thunderstorms, snowfall, overcast skies, clear skies, fog, haze, visibility <3 miles and wind  $\geq 20$  knots; number of Asiatic extratropical cyclones, extratropical cyclone fronts and tropical cyclones (including typhoons); number of typhoons observed over a 10-year period; mean cloud amount (tenths); icing level (thousands of feet); primary direction, secondary direction and mean speed (knots) of surface winds; prevailing direction and mean speed (knots) of winds at heights of 3280, 4920, 6560 and 9840 feet.

167. U. S. Weather Bureau Target area - Indo China, north. Special Report No. 368. 5pp. 194-? DWB M82.2 U587s.

...Consists of textual information on the climate of the northern part of Indo China and tabular summaries for individual stations. The author discusses the weather and climate during the winter monsoon and the summer monsoon, upper winds, visibility, cloudiness and ceilings, the "crachin", typhoons, and thunderstorms. The source presents the following data, summarized over specified periods (vary by element): monthly and annual mean pressure (mb.), mean daily amplitude of pressure (mb.), mean cloud amount (0-10) during daylight hours, mean cloud amount (0-10) at 1000 and 1600, mean relative humidity based on bi-hourly observations, mean number of days with fog, and maximum wind speed (m.p.h.) at Phulien; monthly

Source No. 167 continued

visibility frequency (%) within limits (0-1/2, 1/2-2, 2-5, 5-10, and >10 miles at Phulien; monthly and annual mean and absolute extreme temperatures (°F.), mean amount and greatest and least amounts of precipitation (inches), maximum amount of precipitation (in.) in 24 hours, mean number of days with rain, thunderstorms, and gales, prevailing wind direction (8 points), and mean wind speed (m.p.h.).

1946

168. John, I. G. and Hare, F. K. Winter circulation over Burma, Thailand and Indo-China. Synoptic Divisions Technical Memorandum No. 120 of Great Britain Meteorological Office. 10pp. 1946? DWB M(055) G786s.

...Analyzes a series of synoptic charts for January 1938 for the purpose of explaining the winter circulation over Burma, Thailand, and Indo-China. The authors discuss the general Asiatic circulation in winter, describe the synoptic meteorology of the region, give details concerning the synoptic charts, include a table showing the surface properties of air masses usually detected on the Indo-Chinese coast in January at 1000 C.M.T. and present synoptic charts of the region (Burma, Assam, Thailand, Indo-China, and Tenasserim) for January 1938.

1947

169. Garbell, Maurice A. Tropical and equatorial meteorology. 237pp. New York-Chicago, 1947. DWB M G213t.

...Summarizes the weather in the southwestern North Pacific for each month by describing the airmasses, circulation, tropical disturbances and typhoons of the area and presenting general remarks on the typical conditions on pages 150-160. This area includes Cambodia, South Vietnam, North Vietnam, Laos, Malay Peninsula, Thailand, Philippine Islands, Borneo, Celebes and adjacent sea areas. On pages 186, 189 and 190 the source contains additional information on the Indochinese peninsula in discussing the meteorological characteristics of the China Sea area.

170. Great Britain. Naval Weather Service Summary of weather conditions on the China station. Memo. No. 139/47. March 1947. DWB M(055) G786ma.

...Summarizes weather conditions for the coast of Indo-China and Gulf of Tongking (Cape St. James to Hainan Island). This summary consists of descriptive information on typhoons and surface and upper winds, weather, visibility, air temperature, and swell for the NE monsoon season (October-April) and the SW monsoon season (May to October).

171. Guilmet, Bernard Le temps en Indochine à l'usage des navigateurs aériens (Weather in Indochina for the use of aircraft navigators). 24pp. (In French - a translation to English by Edmund F. Freeman is in DN-HO). circa 1947. DWB PF2924.

...Part I contains a geographical summary of Indochina; discusses the large

Source No. 171 continued

centers of action and the wind regime at the surface in the Far East, air masses and fronts in the Far East and the principal disturbances of the Indochinese area; gives a general climatic summary of the Indochinese Peninsula; describes the climatic regions. These climatic regions include areas of North Vietnam. Part II describes weather of the principal air routes of Indochina by presenting information on the seasonal (winter monsoon, crachin, warm, summer monsoon and transition) weather, winds, low clouds and visibility from Seno or Vientiane to Hanoi; seasonal (winter, crachin, summer, and transition) weather, winds, low clouds, and visibility from Tourane to Hanoi and from Hanoi to Hongkong. The other routes discussed in this source do not extend over North Vietnam.

1948

172. Gourou, Pierre Les pays tropicaux, principes d'une géographie humaine et économique (The tropical countries, principles of human and economic geography). 196pp. (In French). Paris, 1948. DWB 910 G716p.

...In Chapter X presents textual information on French Indochina as typical of the hot and rainy climate of Asia.

173. Indochina. Service de la Statistique Générale Annuaire statistique (Statistical yearbook). Vol. 1-2, 1913-1948. (In French). Hanoi. DLC HA1731 .A3.

...Presents monthly and annual summaries over specified periods (vary by station and element) of mean temperature, absolute and mean extreme temperatures, mean total rainfall amount, number of days with rain, mean relative humidity, prevailing wind direction, total evaporation and mean total evaporation at 5-66 stations in North Vietnam. There are summaries for individual years during the period 1922, 1930, 1931, 1934-1948 of temperature, rain, humidity and prevailing wind direction for selected stations.

174. Kao, Y. S. General circulation of the lower atmosphere over the Far East. Memoirs of the Institute of Meteorology, Academia Sinica 16(1):1-7. Nanking, July 1948. DWB M(055) A168m.

...Is a study based on pilot balloon data for 28 stations in China proper and from data published in bulletins from Korea, Formosa, Indo-China, Siam (Thailand), Malaya and India. The text presents a general description of the flow patterns and a description of the seasonal flow patterns.

175. Tao, Shih-Yen The mean surface air circulation over China. Memoirs of the Institute of Meteorology, Academia Sinica 15(4):1-7. Nanking, July 1948. DWB M(055) A168m.

...Is a study based on reports from 70 stations in China, 45 stations in Siberia, 20 stations in the Philippines, and 30 stations in Indo-China during the period 1931-1936. The text presents the technique used in drawing the streamlines, describes the maps, and gives conclusions.

1949

176. Gauthier, Julien L'Indochine au travail dans la paix française (Indochina at work on the French peace). 323pp. (In French). 1949. DLC HC442 .G3.

...Contains a brief description of the climate of Indochina on pages 15 and 16 and presents notes on the Indochinese Meteorological Service on pages 42 and 43. These include general information on temperature for Cochinchina, Cambodia, Central Annam, Tonkin and Laos; rainfall regime and the southeast monsoon of Indochina; duties of the Meteorological Service.

1950

177. Air Attache, Saigon, Indo-China Weather in Indo-China as pertains to aerial navigation. Translation from the French of a complete report of weather in Indo-China. IR-86-50. September 16, 1950. DN-HO QC990 Indo-China IR-86-50.

...This is a translation of "Le temps en Indochine à l'usage des navigateurs aériens" by Bernard Guilmet. See abstract under author in this bibliography.

178. Alisov, B. P. Klimaticheskie oblasti zarubezhnykh stran (Climatic regions of foreign lands). 351 pp. (In Russian). Moscow, 1950. DWB M8 A414k1.

...Includes tabular monthly mean total precipitation amount (mm.) summarized over an unspecified period at Langson on page 87; maximum temperature for the warmest month and the coldest month, annual mean maximum and minimum temperatures (°C), annual mean amount of precipitation, annual maximum and minimum amounts of precipitation and annual maximum and minimum number of days with precipitation based on data for an unspecified period for Haiphong on pages 108 and 109.

179. Bruzon, E.; Carton, P.; Romer, A. Aperçu général sur le climat de l'Indochine (Outline of the climate of Indochina). Le Climat de L'Indochine, Première Partie, pp. 1-99. (In French). January 1950. DWB M82.2/596 I41c.

...Gives a geographical outline of Indochina; discusses the monsoon regime, the pressure regime, temperature distribution, humidity (vapor pressure, relative humidity, specific humidity, and air density), and rainfall (rainy season, dry season, and precipitation intensity) over Indochina; deals with different phenomena of special interest for aerial navigation, as cloudiness, factors which affect visibility (fog, haze, drizzle, rain, and smoke) and thunderstorms; describes the climatic regions of Indochina. In addition to the textual data the source contains the following tabular summaries: monthly and annual mean station pressure at Hanoi; monthly and annual mean and mean extreme temperatures, mean total rainfall, and mean number of days with precipitation for Langson, Phuliên, Hanoi, Laokay, Chapa, and Vinh; monthly maximum and minimum observed rainfall, monthly maximum amount of rainfall in 24 hours, and the annual rainfall amount for the wettest and the driest years for Langson, Phuliên, Hanoi, Laokay, Chapa, and Vinh; mean low cloud amount (clouds less than 2500 m.) in tenths at 0700, 1000, and 1600 for January, April, July, and October at Moncay, Phu-Liên, Hanoi, Lang-Son, Lao-Kay, Lai-Chau, Thanh-Hoa, Vinh, and Dong-Hoi; monthly frequency (%) of height of lowest clouds (ceiling) at 0700, 1000, 1300, and 1600 based on 10 years (1931-1940) of data at Lao-Kay, Hanoi, Phu-Lien,

Source No. 179 continued

Vinh and Dong-Hoi; monthly frequency (%) of horizontal visibility at 0700, 1000, 1300, and 1600 at Lao-Kay (1931-1940), Hanoi, Phu-Lien (1931-1940), Vinh (1932-1941), and Dong-Hoi; monthly mean number of days with morning fogs for Phu-Liên, Hanoi, Lang-Son, Lao-Kay, Sonla, Thanh-Hoa, and Vinh; monthly number of days with thunderstorms at Phu-Liên, Hanoi, Lang-Son, Lao-Kay, Sonla, Thanh-Hoa, Vinh, and Dong-Hoi.

180. Dobby, E. H. G. Southeast Asia. 415pp. London, 1950. DLC DS508 .D58.

...In Chapter Nineteen presents brief notes on the wind, rain, and typhoons in describing the climate of Indochina. This chapter also contains tabular monthly and annual rainfall amount (inches) for Hanoi. In Chapter II the author discusses the wind regime, rainfall, typhoons, sunshine, humidity and altitude effects in Southeast Asia.

181. Lautensach, H. Luftmassen und Fronten in Süd- und Ostasien (Air masses and fronts in south and east Asia). *Leben und Umwelt* 6(7):145-152. (In German). Aarau, April 1950. DNAL 410 L49.

...Discusses the air masses and fronts in tropical south and east Asia.

182. Romer, A. Le régime des vents en Indochine (Wind regime in Indochina). *Le Climat de L'Indochine, Deuxième Partie*, pp. 101-158. (In French). January 1950. DWB M82.2/596 I41c.

...Presents information on the seasonal wind regime at the surface and in the upper air over Indochina; discusses the local influences of the wind force (land and sea breezes, foehn effect, and turbulence); describes the surface and upper air currents over Indochina. The source also contains wind direction (16 points and calm) frequency (%) at 0700 and 1300, mean wind speed (kph) by direction (16 points) at 0700 and 1300, and frequency of wind speed  $\geq 6$  Beaufort ( $\geq 35$  kph) at 0700 and 1300 for January, April, July, and October at Phu-Liên, Hanoi, Lang-Son, Lao-Kay, Lai-Châu, Son-La, Thanh-Hoa, Vinh and Dong-Hoi; wind direction (16 points and calm) frequency (%) at heights of 0.5, 1, 2, 3, 4, 5, and 6 km. and frequency of wind speeds between 50 and 75 kph and  $>75$  kph at heights of 0.5, 1, 2, 3, 4, 5, and 6 km. for January, April, July, and October at Hanoi and Vinh; annual frequency (%) of winds within limits ( $<6$  kph and  $>26$  kph) at 0700, 1000, 1300, and 1600 at Hanoi, Phu-liên and Vinh.

183. United Nations. Economic Commission for Asia and the Far East Flood damage and flood control activities in Asia and the Far East. Flood Control Series, No. 1. 81pp. Bangkok, October 1950. DWB M79.7 U58f.

...Discusses the climate of Asia and the Far East, an area extending from the Sunda Islands, south of the equator, to Manchuria and Korea in the north. This includes information on temperature, pressure and wind, precipitation and cyclones. The source also presents graphs showing the monthly mean total rainfall amount (mm) and mean temperature (°C) for Hanoi.

184. World Meteorological Organization CLINO No. 51. 1950. DWB M82.2 W927c.

...Contains the following monthly summaries based on data for the period 1906-1935 for Hanoi, Lang-Son, Mon-Cay, Lao-Kay, and Dong-Hoi: normal mean total amount of precipitation (mm.); frequency groups of precipitation.

1951 - 1960

1951

185. France. Ministère de la France d'Outre-mer. Service des Statistiques Annuaire statistique de l'Union française Outre-mer (Statistical yearbook for the French Overseas Union). 1939-1949. Tome Premier. 453pp. (In French). Paris, 1951. DWB M:314.4 F815an.

...Includes the following tabular data for Hanoi: annual mean relative humidity at 0900 U.T. for 1949; monthly and annual mean maximum and mean minimum temperatures (°C) for 1949 and for the period 1907-1944; monthly and annual summaries for 1949 and for the period 1931-1945 of rainfall amount (mm) and number of days with rain; monthly and annual mean relative humidity at 0000 U.T. for 1949 and for the period 1927-1946; annual total rainfall amount, total number of days with rain and mean relative humidity at 0000 U.T. for each year (1946, 1948).

186. Great Britain. Hydrographic Office China sea pilot. Vol. I. Second edition. 704pp. London, 1951. DWB M82/512.3 G786c.

...Presents textual information on climate and weather on pages 36-53 for the area comprising the western shore of the China Sea from Tanjong Penawar, on the eastern side of Johore, to Fokai Point, Bias Bay; the Anambas Eilanden and Hainan Island; also the islands and banks bordering the main route from Singapore Strait to Hong Kong. On page 58 the source contains the following monthly and annual data, summarized over the period for Phu Lien: mean sea level pressure (29 years) in mb.; mean daily maximum and minimum temperatures (32 years) in °F.; mean of the highest and mean of the lowest temperatures (27 years) in °F.; mean daily maximum and minimum relative humidities (32 years); mean number of clear (<2/10) and cloudy (>8/10) days (2-3 years); mean total rainfall amount (32 years) in inches; mean number of days with rain  $\geq 0.04$ " (2-3 years); wind direction (8 points and calm) frequency (2-4 years) at 0600 and 1400 in %; mean wind speed (29 years) in knots; mean number of days with gales (27 years) and fog (27 years).

187. Ramage, C. S. Analysis and forecasting of summer weather over and in the neighborhood of South China. Journal of Meteorology 8:289-299. Lancaster, October 1951. DWB M(05) A512j.

...As a result of re-analyzing 1948 and 1949 data at 10,000 ft., flow-rainfall-distribution relationships have been found, which enables the summer weather patterns over and in the neighborhood of South China to be classified under the following headings: tropical storm; pressure wave; broad deep south westerlies; wedge from North Pacific anticyclone and anticyclone cell.

188. Thompson, B. W. An essay on the general circulation of the atmosphere over South-East and the West Pacific. Quarterly Journal of the Royal Meteorological Society 77(334):569-597. London, October 1951. DWB M(05) R888q.

...Analyzes the airflow between the surface and 10,000 feet for South-East Asia and the West Pacific based on data since 1947; describes the upper-level influences on the airflow; presents illustrative maps.

189. Thompson, B. W. The upper-level flow-structure near typhoons. Quarterly Journal of the Royal Meteorological Society 77(332):272-282. London, April 1951. DWB M(05) R888q.

...From flow charts drawn at the Royal Observatory, Hong Kong, it appears that typhoons commonly develop at airflow discontinuities with Easterlies to the north and Westerlies to the south. Others probably develop within a single airflow, notably N. Pacific Trades, and perhaps N. Indian Westerlies. Typical streamlines in the neighbourhood of typhoons in different localities are presented, and the development and relations of the associated flows are discussed.

The Author

190. U. S. Quartermaster Corps. Research Development Division Clothing almanac No. 18: Southeast Asia (Thailand, Burma, French Indochina and the Federation of Malaya). 22pp. Washington, December 1951. DWB M86 U585c.

...Discusses briefly the climate of Southeast Asia, including Thailand, Malaya, Burma, Laos, Cambodia, North Vietnam and South Vietnam on pages 1-3. The discussion presents information on winds, temperature, and rain. On page 4 there are tabular monthly summaries over an unspecified period of mean temperature (°F.) and mean total rainfall amount (in.) at Hanoi.

1952

191. Ramage, C. S. Relationship of general circulation to normal weather over southern Asia and the Western Pacific during the cool season. Journal of Meteorology 9(6):403-408. Lancaster, December 1952. DWB M(05) A512j.

...Has as its purpose the exploration of major factors controlling normal weather-sequences and -distribution over the subtropical and tropical regions of Asia and the western Pacific during the cool season. The author discusses the southern jet-stream, subsidence south of the jet-stream and tropical storms for the area and gives conclusions.

192. Tannehill, Ivan Ray Weather around the world. Second edition. 212pp. Princeton, 1952. DWB M T166we.

...On pages 119 and 120 presents brief notes on the climate of China and southeastern Asia, which includes Indochina.

193. Vacin, Emil F. Climatological studies of the original habitats of Cymbidiums. American Orchid Society, Bulletin 21(7):517-532. Cambridge, July 1952. DLC SB409 .A1A62.

Source No. 193 continued

...Describes briefly the climatic conditions in the Cymbidium habitats of Tongking and Annam.

1953

194. Canada. Department of Mines and Technical Surveys. Geographical Branch Indo-China. Foreign Geography Series No. 6. 88pp. Ottawa, 1953. DLC DS534 .C34.
- ...Discusses the climate of Indochina which is dominated by the annual regime of monsoonal winds and precipitation under the following headings on pages 16-18: monsoon regime, winds, temperature, precipitation, and climatic regions. The source also presents graphs showing the distribution of monthly mean temperature (°F.), mean total amount of precipitation (in), and mean number of rainy days at individual stations (Hanoi and Haiphong in North Vietnam) in Indochina based on data over an unspecified period.
195. Hong Kong. Royal Observatory Monthly weather summary: southeast Asia and the western Pacific. 1949-June 1953. Hong Kong. DWB M82.1/512.5 H772m.
- ...Contains descriptive weather summaries for each decade of southeast Asia and the Western Pacific.
196. Indochina, French. Service Météorologique Résumé mensuel du temps en Indochine (Monthly weather summary in Indochina). 1949-1953. (In French). IWB M06.1/596 V6'5r.
- ...See abstract under Vietnam. Service Météorologique, Résumé mensuel du temps en Indochine.
197. U. S. Quartermaster Research and Development Center, Natick, Mass. Environment of Southeast Asia. Environmental Protection Division Report No. 219. 45pp. August 1953. DWB M86 U585r.
- ...Discusses the climate of Southeast Asia, including Burma, Thailand, Laos, Cambodia, North Vietnam, South Vietnam and Malaya on pages 15-29. The discussion with emphasis on Laos and Thailand contains information on the regional climatic pattern, precipitation, temperature, humidity, winds, cloud cover and visibility and storms. The source contains the following tabular summaries over specified periods for stations in North Vietnam: monthly mean amount, maximum and minimum amounts and maximum amount in 24 hours of precipitation (in.) at Cha Pa (16 years) and Hanoi (31 years); monthly and annual mean, mean maximum and minimum and absolute maximum and minimum temperatures (°F.) for Cha Pa (10 years) and Hanoi (33 years); monthly and annual mean relative humidity (%) at Hanoi (20 years).
198. U. S. Weather Bureau Synoptic weather maps: Northern hemisphere sea level and 500 millibar charts with synoptic data tabulations. 1949-October 1953. Washington. DWB M09.2 U587s. Oversize.
- ...Contains coded synoptic surface observations at 1230Z, winds aloft observations at 0300Z and coded radiosonde and rawinsonde data at 0300Z for at least

Source No. 198 continued

1-5 stations (Langson, Hanoi, Dong Hoi, Caobang, Namdinh and Haiphong) in North Vietnam. The synoptic surface code is  $T_d T_d$  Nddff VVwwW PPPTT  $N_h C_c C_c H$   $6D_{capp}$   $7RRR_t$  and the winds aloft code is  $iiGG$   $Oddf_{m^m}$   $3ddf_{m^m}$   $9ddf_{m^m}$  ... for varying periods of record. Earlier years contain very scattered observations.

199. World Meteorological Organization World distribution of thunderstorm days. Part I; Tables. WMO - No. 21. TP.6. 204pp. Geneva, 1953. DWB M(06) W927p.

...Includes monthly, seasonal, and annual mean number of days with thunderstorms, summarized over specified periods, for Hanoi (10 years), Haiphong (8 years), and Dong Hoi (9 years) on pages 50 and 51.

200. Annuaire des états-associés. Cambodge - Laos - Vietnam (Yearbook of the associated states. Cambodia - Laos - Vietnam). 578pp. (In French). Paris, 1953. DLC DS521 .A65.

...Discusses briefly the monsoons, temperature, typhoons, pressure regime, crachin and rainfall regime of Cambodia, Laos, and Vietnam; presents graphs showing annual absolute maximum and minimum temperatures (also numerical values) for individual stations (Chapa and Hanof in North Vietnam) with months of occurrence; includes numerical monthly and annual mean maximum and minimum temperatures and mean total rainfall amount for representative stations (Hanof in North Vietnam). Periods of record are not specified.

1954

201. Cronin, Jack. A brief summary of en route weather on the HKG/BKK/HKG and MNL/SIN/MNL routes. Pan American World Airways. 7pp. Bangkok, September 1954. DWB M06.1/59 C947b.

...Consists of descriptive weather summaries for each month along the 2 routes (Hong Kong/Bangkok/Hong Kong and Manila/Singapore/Manila) and describes weather conditions at three terminals (Manila, Singapore, and Hong Kong).

202. France. Meteorologie Nationale Annales des Services Météorologiques de la France d'outre-mer (Yearbook of the Meteorological Services of overseas France). 1951-1954. (In French). Paris, 1955-1958. DWB M06.1/44om F815a.

...Includes brief notes on the general character of the development of weather and its influence on the climatic elements of Indochina for each year 1951-1954. The tables present monthly and annual summaries for each year (1-4 years within the period 1951-1954) for 1-5 stations in North Vietnam of mean extremes of day and night pressures, mean pressure, absolute extreme pressures, number of squalls, mean and mean extreme temperatures, absolute extreme temperatures, mean temperature at specified hours (vary by year), number of days with mean daily temperature  $\geq 20^\circ$  and  $\geq 30^\circ$ , number of days with maximum temperature within defined limits ( $\geq 25^\circ$ ,  $\geq 32^\circ$  and  $\geq 40^\circ$ ), number of days with minimum temperature within specified ranges ( $\geq 0^\circ$ ,  $\geq 10^\circ$  and  $\geq 20^\circ$ ), absolute and mean daily extremes of relative humidity, mean

Source No. 202 continued

relative humidity at specified hours (0400, 0700, 1300 and 1900), mean vapor pressure, total amount and maximum amount in 24 hours of evaporation, number of days with miscellaneous phenomena (fog, light fog, haze, exceptional visibility, dew, thunderstorms, lightning without thunder, sandstorms, no sunshine, continuous sunshine and wind speed  $\geq 16$  mps and  $\geq 21$  mps), mean cloud amount at specified hours (0400, 0700, 1300 and 1900), total number of clear and cloudy days, visibility frequency at specified hours (0400, 0700, 1300 and 1900), wind direction frequency at specified hours, wind speed frequency at specified hours (0400, 0700, 1300 and 1900), total amount of precipitation, maximum amount of precipitation in 24 hours and mean number of days with rain within defined limits ( $\geq 0.1$ ,  $\geq 10$ ,  $\geq 30$  and  $\geq 50$  mm); monthly distribution of days with rain; 10-day totals of precipitation for each month. There are also monthly and annual summaries over specified periods (vary by station and element) of mean pressure, absolute extreme pressures, mean temperature, absolute and mean extreme temperatures, highest and lowest mean temperatures, mean relative humidity, absolute extreme relative humidities, mean rain within defined limits ( $\geq 0.1$ ,  $\geq 10$ ,  $\geq 30$  and  $\geq 50$  mm); monthly distribution of days with rain; 10-day totals of precipitation for each month. There are also monthly and annual summaries over specified periods (vary by station and element) of mean pressure, absolute extreme pressures, mean temperature, absolute and mean extreme temperatures, highest and lowest mean temperatures, mean relative humidity, absolute extreme relative humidities, mean vapor pressure, highest and lowest mean vapor pressures, mean total evaporation, mean cloud amount at specified hours (0400, 0700, 1300 and 1900), mean total precipitation amount, greatest and least amount of precipitation, maximum amount of precipitation in 24 hours and number of days with rain  $\geq 0.1$ ,  $\geq 10$ ,  $\geq 30$  and  $\geq 50$  mm. The source presents data for Haiphong, Hanoi, Donghoi, Moncai and Namdinh.

203. Great Britain. Meteorological Office Temperature, rainfall and humidity tables: Asia. London, 1954?. DWB M82.2 G786.

...Contains the following tabular summaries over specified periods for Phu Lien: monthly and annual mean daily extreme temperatures (32 years) in °F.; monthly and annual mean of the highest and mean of the lowest temperatures (27 years) of each month and the year; annual absolute extremes of temperature (32 years) in °F.; monthly and annual mean daily extremes of relative humidity (32 years); monthly and annual mean total amount (32 years) and maximum amount (27 years) in 24 hours of rainfall (in.); monthly and annual mean number of days with rainfall  $>0.04$ " (2-3 years).

204. Indo-China, French. Service Météorologique Bulletin météorologique (Meteorological bulletin). 1953 and 1954. Title varies: Bulletin Journalier prior to November 1953. (In French). DWB M09.2/596 I41b.

...This source, superseded by "Vietnam. Service Météorologique, Carte générale, 00 TU", contains, for varying periods during 1953 and 1954, general daily weather forecasts for Indochina; observations in synoptic code (iiiT<sub>d</sub>T<sub>d</sub> Nddff VVwwW PPPTT N<sub>h</sub>C<sub>L</sub>hC<sub>M</sub>CH 7RRRT<sub>n</sub>T<sub>n</sub>) at 0000Z for individual stations (Hanoi, Haiphong, Namdinh, Donghoi and Hue in North Vietnam); coded pilot balloon observations (iiiGG Oddff Hddff Hddff Hddff Hddff ..... 99991 Hddff Hddff Hddff ..... 99992 Hddff .....)

Source No. 204 continued

at 1-2 specified hours at individual stations (Haiphong and Hanoi in North Vietnam); observations at 0000Z of geopotential height, temperature, dew point temperature, wet-bulb potential temperature and wind direction and speed at standard and significant levels by radiotheodolite soundings at Hanoi; heights of 0° and -10°C isotherms at 0000Z at Hanoi; tropopause pressure, height and temperature at 0000Z at Hanoi; extreme temperatures at Hanoi and Catbi.

205. Ramage, C. S. Non-frontal crachin and the cool season clouds of the China Seas. American Meteorological Society, Bulletin 35(9):404-411. Lancaster, 1954. DWB M(05) A512b.

...The crachin of the coastal regions of south China and northern Indochina develops during the cool season whenever relatively moist air is cooled sufficiently by contact with the cold coastal waters to lower its condensation level below the level of turbulent mixing. Inter-mensual and diurnal variation of crachin are discussed as well as its coincidence with low-level winds veering with height. Forecasting procedures are listed. Over the China Seas beyond the crachin zone, convective cloud predominates, but as sea-air temperature differences steadily decrease through the latter part of the cool season, cloud amounts also diminish.

The Author

206. Sanderson, Robert W. Notes on the climate of Indochina. Weatherwise 7(3):56-59, 69. Boston, June 1954. DWB M(05) W362.

...Contains notes on the climate of Indochina with special attention directed toward favorable and unfavorable conditions for military operations. These notes give information on the geographical location, physiography of the country, the monsoons, crachin, thunderstorms, temperature, relative humidity, rainfall, snow, cloud amount, ceiling, and typhoons. This study also presents the following: tabular monthly frequency of typhoons in Indochina based on 25 years of data; a graph showing the monthly values of mean temperature (°F), mean relative humidity (%), and mean amount of precipitation (in) for Hanoi.

207. U. S. Air Weather Service. 1st Weather Wing Weather and climate of Indochina. 101pp. June 1954. DWB M82.2/596 U5915w.

...Describes the topography of Indochina; discusses the seasonal (winter monsoon, spring transition, summer monsoon, and autumn transition) climate, the crachin, typhoons, climatic regions, climatic elements (surface temperatures, temperatures aloft, relative humidity, precipitation, clouds, visibility, surface winds, and winds aloft), drainage, soil trafficability, coasts and landing beaches, tides, weather and air operations (seasonal flying weather), air-ground operations, and ground surface operations; presents a graph showing monthly mean and extreme water levels of the Red River at Hanoi (1907-1930) and tabular summaries of various elements for individual stations. These summaries include the following for stations in North Vietnam: mean and maximum number of days with "crachin" weather at

Source No. 207 continued

0600, 0800, 1000, 1400 and 1600 LST for February and March at Hanoi, Mon Cay, Phu Lien, Dong Hoi, Thanh Hoa, and Vinh based on 6 years of data; monthly and annual mean number of days with thunderstorms based on data for an unspecified period for Son La, Hanoi, Phu Lien, Dong Hoi and Vinh; monthly and annual mean temperature (°F.), mean and absolute extreme temperatures (°F.), mean relative humidity, maximum and minimum amounts of precipitation (inches), mean number of days with precipitation  $\geq 0.004$ ", and maximum amount (inches) of precipitation in 24 hours based on data for 4-34 years (period varies by station and element) at Lai Chau, Son La, Ha Giang, Lang Son, Mon Cay, Phu Lien, Hanoi, Dong Hoi, Thanh Hoa, and Vinh; monthly mean total amount of precipitation (inches) based on data for specified periods at 12 stations; monthly frequency (%) of relative humidities  $< 70\%$  and  $> 90\%$  based on data for 7 years at Hanoi, Phu Lien, and Vinh; monthly and annual mean cloud amount (%) based on data for 4-33 years (period varies by station) at Lai Chau, Son La, Ha Giang, Hanoi, Lang Son, Phu Lien, Dong Hoi, Thanh Hoa and Vinh; bimonthly mean frequency (%) of observations with ceiling below specified altitudes (983, 3280, and 8201 ft.) at 0600 and 1300 LST based on data for an unspecified period at Hanoi, Phu Lien, and Vinh; monthly and annual mean number of days at 0600 and 1300 LST with fog and number of days favorable for contact flight (ceiling  $\geq 1000$  ft. with visibility  $\geq 2 \frac{1}{2}$  miles), favorable for medium-level operations (sky cover  $\leq 3$  tenths below 8,201 ft., with visibilities  $\geq 2 \frac{1}{2}$  miles), and favorable for high-level operations (total sky cover  $\leq 3$  tenths with visibility  $\geq 2 \frac{1}{2}$  miles) based on data for 4-8 years (period varies by station) at Son La, Hanoi, Lang Son, Mon Cay, Phu Lien, Dong Hoi, Thanh Hoa, and Vinh; monthly and annual mean number of days with haze at 0600 and 1300 LST based on data for 4-8 years (period varies by station); bimonthly mean frequency (%) of observations with visibility  $< 1.0$ ,  $< 2.5$ , and  $< 6.0$  miles at 0600 and 1300 LST based on data for an unspecified period at Hanoi, Phu Lien, and Vinh; monthly mean wind speed (mph) at 0600 and 1300 LST and prevailing wind direction (16 points) based on data for an unspecified period at Hanoi, Lang Son, Lao Kay, Dong Hoi, and Vinh; monthly modal wind direction in degrees, mean wind speed (knots) for modal direction, and mean wind speed (knots) for all directions at heights of 1000, 2000, 3000, and 6000 meters based on data for specified periods at Hanoi (5 years) and Vinh (4 years).

208. Vietnam. Ministère de l'Economie Nationale Thống kê niên (Statistical yearbook). 1949-1954. Vol. 1-5. (In Vietnamese and French). DNAL 269.1 V67.

...Includes monthly and annual summaries for each year (1949-1954) and over specified periods (vary by station and element but within the period 1907-1954) of mean temperature, mean extreme and absolute extreme (only in volume for 1951) temperatures, amount of measurable rainfall, maximum and minimum amounts (only in volume for 1951) of rainfall, maximum and minimum number of days with rainfall (only in volume for 1951), number of rainy days and mean relative humidity for 6-8 stations per year in North Vietnam. These stations are Caobang, Laokay, Langson, Moncay, Hanoi, Haiphong, Namdinh, Donghoi and Gowtow.

209. Vietnam. Service Météorologique Résumé mensuel du temps en Indochine (Monthly weather summary in Indochina). 1949-1954. Prior to 1954 issued under an earlier name of the country: Indochina, French. Service Météorologique. (In French). DWB M06.1/596 V666r.

Source No. 209 continued

...Describes the weather of Indochina by month and presents tabular data for each year (1949-1954) for individual stations. These data for 1-14 stations in North Vietnam for varying periods of record include daily and monthly amounts of precipitation, duration of sunshine, maximum and minimum temperatures, total evaporation and mean dew point temperature; bi-hourly (0200-2400) observations for 1952 and hourly observations for 1953 and 1954 with monthly summaries of pressure and temperature; daily and monthly mean pressures and temperatures based on bihourly (1952) and hourly (1953 and 1954) observations; hourly distribution of hydrometeors (rain and thunderstorms at a distance but not at the station; fog, showers, rain, hail, thunderstorms, precipitation, evaporation and sunshine) by month; monthly summaries at specified hours (2-8; vary by station, year and element) of mean temperature, mean relative humidity, mean vapor pressure, mean total cloud amount, mean wind speed, mean pressure, mean dew point, prevailing wind direction, visibility frequency, wind direction (16 points and calm) frequency and ceiling frequency; monthly summaries of mean temperature with departure from normal, mean and absolute extreme temperatures, lowest maximum and highest minimum temperatures, mean and absolute ranges of temperature, highest and lowest daily ranges of temperature, mean and minimum relative humidities, total evaporation, maximum amount of evaporation in one day, total amount of precipitation with departure from normal, maximum amount of precipitation in one day, number of days with precipitation, number of days with miscellaneous weather phenomena (rain, crachin, fog, dew, wind >21 mps, thunderstorms at the station, thunderstorms in the distance, lightning, squalls and wind gust), mean vapor pressure, maximum wind speed, absolute maximum and minimum pressures and am and pm mean extreme pressures; monthly wind speed frequency by direction and resultant winds at specified hours (vary by station) at heights of 500, 1500, 3000 and 6000 m; monthly mean, maximum and minimum geopotential heights, pressures, temperatures, relative humidities, mixing ratios and dew points and wind direction (36 points and calm) and mean speed by direction (36 points and calm) at levels of 850, 700, 500, 300 and 200 millibars at 0000 GMT; monthly mean, maximum and minimum heights of 0°C and -10°C isotherms at 0000 GMT; monthly maximum amount of rainfall in 15, 30 and 45 minutes, 1 hour, 1 1/2, 2 and 3 hours; monthly and annual hourly mean pressures and temperatures. There are also summaries over specified periods (vary by element and station) of monthly and annual mean, maximum and minimum number of days with precipitation within specified limits, annual maximum amount of precipitation in 24 hours; annual maximum and minimum amounts of precipitation with years of occurrence; monthly and annual absolute extreme and mean extreme temperatures; monthly and annual absolute extreme pressures for 2-7 stations in North Vietnam.

1955

210. Ramage, C. S. The cool-season tropical disturbances of Southeast Asia. *Journal of Meteorology* 12(3):252-262. Lancaster, 1955. DWB M(05) A512j.

...During the cool season (November through April), two types of tropical disturbance occasionally bring rain to a normally dry part of southeast Asia. The area, enclosed approximately between 15°N and 25°N, and 95°E

Source No. 210 continued

and 120°E, includes south China and the northern portion of Indo-China and Thailand.

In early winter, tropical storms or easterly waves, moving westward to the south of the subtropical ridge, may cause sufficient convergence north of the ridge to give rain.

In late winter and spring, tropical troughs in the high-level (above 400 mb) southwesterlies cross southern India. Moving eastward, they link in the region of Burma and the low-latitude polar westerlies further north, then intensify and become stationary over the Thailand-Indo-China region. East of the trough line, disturbances with extensive rain areas develop on the China Sea polar front.

The Author

211. Ramsey, B. Upper winds in the south-east Asia - west Australia region. Meteorological Magazine 84(1,002):372-377. 1955. DWB M(05) G786m.

...Is a survey of upper winds centered along the meridian of 110°E. for April, July and October 1953 and January 1954. The author describes the data used and the mean cross-section for each month, presents cross-sections for each month, compares these cross-sections with other meridional cross-sections and contains the tabular W. components for each month at each 10,000-ft. level from 10,000 to 50,000 ft. and at each 10° latitude (20°N.-30°S.). This study is based on data from a number of stations in the area. The stations include Hanoi in North Vietnam.

212. U. S. Weather Bureau Monthly climatic data for the world. 1949-1955. Asheville. DWB M06.1 U587m.

...Presents tabular monthly summaries for each year (period varies by station and element) of mean pressure; mean temperature; mean relative humidity; total amount of precipitation; precipitation quintile; dynamic height, temperature and dew point at levels of 850, 700, 500, 300 and 200 mb. These summaries are for 1-5 stations (Langson, Hanoi, Moncay, Dong Hoi and Haiphong) and North Vietnam. Reports are not regular.

213. Vietnam. Direction de la Météorologie Carte générale 00 TU (General map at 00Z). January-June 1955. Title and issuing office for this series vary: Vietnam. Service Météorologique, Bulletin météorologique journalier in 1955. (In French). Saigon. DWB.

...Supersedes "Indochina, French. Service Météorologique, Bulletin Météorologique", 1953 and 1954. See abstract under "Vietnam. Service Météorologique, Bulletin météorologique journalier."

214. Vietnam. Service Meteorologique Bulletin météorologique journalier (Daily meteorological bulletin). January-June 1955. (In French). Saigon. DWB M09.2/596 V666b.

...Presents daily extreme temperatures for Catbi and coded synoptic observations (iii Nddff VVwwW PPPTT N<sub>h</sub>C<sub>L</sub>C<sub>M</sub>C<sub>H</sub> T<sub>d</sub>T<sub>d</sub>xxx 7RRT<sub>n</sub>T<sub>n</sub>) at 0000Z for Haiphong.

215. Watts, I. E. M. Equatorial weather with particular reference to Southeast Asia. 224pp. New York, 1955. DWB M82 W349e.

...The purpose of this source is to provide a report on the principles of analyzing equatorial weather. Although specific examples are presented for Southeast Asia the analysis is in general applicable to the entire equatorial region. Parallels and contrasts are drawn between conditions of this area and those of higher latitudes. The equatorial weather is discussed under the following headings: equatorial air circulation; observations; conditions in the upper air; formation of fog and cloud at low latitudes; strong convection and precipitation; rainfall types of Southeast Asia; theory of equatorial air-movements; air-stream analysis; slope of air-stream boundaries; cloud structure on air-stream boundaries and convergence lines; circulation over Southeast Asia; examples of air-stream analysis; local disturbances; forecasting rain; equatorial air-stream boundaries elsewhere. On page 51 in the text there is a description of rainfall distribution over Indochina.

216. The Meteorological Service of Viet-Nam. World Meteorological Organization, WMO Bulletin IV(3):116-118. Geneva, July 1955. DWB M(05) W927w.

...Presents a brief history of the Indochinese Meteorological Service from its institution in 1897 until its division into Services for individual sovereign states in 1954. The article also contains notes on the organization of the Viet-Nam Meteorological Service with its headquarters at Saigon.

1956

217. France. Institut National de la Statistique et des Études Économiques Annuaire statistique de l'Union française (Statistical yearbook the French Union). Fascicule 1. pp.8-10. Paris, 1956. D-BC.

...Records annual summaries of mean extreme temperatures, mean vapor pressure, evaporation, total amount of rain and total number of days with rain for Hanoi in North Vietnam.

1957

218. Martonne, Emm. de Traité de géographie physique (Treatise on physical geography). Tome premier. Neuvième édition. 496pp. (In French). Paris, 1957. DWB 551.4 M387tr.

...On pages 253 and 254 discusses the monsoon climates of Indochina. The source also contains on page 264 the following data for Hanoi: type of climate; annual mean temperatures; mean temperature for the warmest month (July) and for the coldest month (February); monthly and annual mean total amount of precipitation. The period of record is not specified.

219. U. S. Hydrographic Office Sailing directions for the western shores of the South China Sea from Singapore Strait to and including Hong Kong, H. O. Pub. No. 125. Fifth edition. 458pp. Washington, 1957. DWB M82/512.3 U58s.

Source No. 219 continued

...Describes the climate of the western shores of the South China Sea from Singapore Strait to and including Hong Kong on pages 21-46. In the appendix the source contains the following monthly and annual tabular data, summarized over specified periods for Haiphong: mean (29 years), mean daily amplitude (27 years), and absolute minimum (33 years) sea level pressures (mb.); mean, mean daily maximum and mean daily minimum and absolute maximum and absolute minimum temperatures (33 years) in °F.; mean daily maximum and mean daily minimum relative humidities (32 years); mean cloud amount (33 years) in tenths; mean number of clear (<2 tenths) and cloudy (>8 tenths) days (2-3 years); mean, greatest, least, and maximum in 24 hours amounts (inches) of precipitation (33 years); mean number of days with precipitation  $\geq 0.01$ " (2-3 years) and  $\geq T$  (33 years); wind direction (8 points and calm) frequency (%) at 0600 and 1400 L.S.T. based on 2-4 years of data; mean wind speed (29 years) in knots; mean number of days with gales (27 years); mean number of days with fog.

1957

220. Vietnam. Service Météorologique Climatic charts. Upper winds at selected stations of Vietnam, Laos and Cambodia. (In Vietnamese and English). DWB M06.1/596 V666cl.

...Presents monthly wind roses at specified heights (500, 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, and 9000 meters) for Hanoi (1930-1939, 1948-1953).

1958

221. Haman, Krzysztof Wietnamsko-Polska stacja aerologiczna w Cha-Pa (The Vietnamese-Polish aerologic station at Cha-Pa). Acta Geophysica Polonica VI(3):296-298. (In Polish). Warszawa, 1958. DWB P.

...Describes the location, program, installations, personnel, observational practices, special phenomena and scientific problems of the aerological station at Cha-Pa (22°21'N, 103°50'E).

222. Pédelaborde, Pierre Les moussons (The monsoon). 208pp. (In French-A translation to English by M. J. Clegg is in DWB). Paris, 1958. DWB M53.21 P37lmo.

...The chapter on the Malayan monsoon contains brief notes on the climates of (1) the coastlands of South China and Tonkin and (2) the center of Indochina to the south of the 20°N latitude. There is also a graph showing the monthly values of rainfall amount and mean temperature at Phu-Lien (1906-1930).

223. Stefanicki, Kazimierz Wietnamsko-Polska Stacja Meteorologiczna w Cha-Pa (The Vietnamese-Polish meteorological station at Cha-Pa). Acta Geophysica Polonica 6(3):299-302. (In Polish). Warszawa, 1958. DWB P.

...Consists of descriptive information on the location and instruments of the meteorological station at Cha-Pa and tabular summaries for this station. These summaries include monthly and annual data summarized over specified periods of mean temperature, mean maximum and minimum temperatures with range, and absolute maximum and minimum temperatures (°C) for 1920-1930, 1942-1944; mean total

Source No. 223 continued

precipitation (mm), mean number days with precipitation, and maximum and minimum amounts of precipitation (mm) with years of occurrence for 1918-1930, 1938-1944; mean, mean maximum and mean minimum and absolute minimum relative humidities (%) for 1930-1931, 1942-1944; mean cloud amount (0-10) for 1920-1926, 1928-1930, 1942-1944.

224. Thompson, Will F. Analogs of Canal Zone climate in India and Southeast Asia. U.S. Quartermaster Research and Engineering Center, Natick, Mass. Technical Report EP-91. 24pp. June 1958. DWB M86 U585t.

...Compares the following tabular monthly and annual data, summarized over specified periods for Chapa (10 years) and Hanoi (30 years) with identical summaries for Balboa Heights and Cristobal: mean temperature (°F); mean daily maximum and minimum temperatures (°F); mean total amount (inches) of precipitation, mean cloud amount (tenths), mean relative humidity (%), and mean wind speed (mph).

225. Vietnam. Service Météorologique Climatic charts. Pressure-temperature-humidity-nebulosity-rainfall & surface wind at selected stations. (In Vietnamese and English). 1958. DWB M06.1/596 V666c1.

...Presents monthly wind roses, numerical annual rainfall amount, numerical monthly number of days with rainfall and graphs showing the monthly values of the following: maximum, mean, and minimum pressures; maximum, mean, and minimum temperatures; mean and minimum relative humidities; mean total and mean low cloud amounts; maximum, mean, and minimum rainfall amounts. These data are presented for 8-9 stations (Dong-Hoi, Vinh, Thanh-Hoa, Phu-Lien, Hanoi, Son-La, Moncay, Lang-Son and Laokay) in North Vietnam. Period of record varies by station and element.

226. Xien, Nguyen. Relationship between rainfall in third quarter of 1958 and drought prevention programs in North Vietnam. New York, U. S. Joint Publications Research Service, 1959. (JPRS L-1540-D). Translated from Nhan Dan, December 17, 1958. 6pp. DWB M78.1 X991re.

...Discusses the relationship between rainfall and drought prevention, distribution of rainfall into regions and the function of position and topography, distribution of rainfall by months and the function of typhoons, difference between mountainous and flat regions and the function of the tropical formation of rain clouds.

1959

227. France. Service Hydrographique Instructions nautiques. Détroit de Malacca, Presqu'île de Malacca, Indochine (Sailing directions. Malacca Straits, Malacca Peninsula, Indochina). Serie K(IV). 403pp. (In French). Paris, 1959. DN-HO FR VK 905 v.1. 1959.

...Presents notes on the general climatic conditions, atmospheric pressure, winds, temperature, humidity and cloudiness, precipitation, visibility and and fogs, and typhoons for the area. The source also contains tabular

monthly and annual summaries over unspecified periods of mean daily maximum and minimum temperatures, mean monthly maximum and minimum temperatures, mean relative humidity, mean cloud amount (oktas) at 0700 and 1200 LT., mean total amount of rain, mean number of days with rain, mean wind speed (mps) at 0700 and 1300 LT., wind direction frequency at 0700 and 1300 LT., and mean number of days with fog for Hanoi.

228. Karamyshev, V. P. Sel'skoe khozyaystvo Demokraticheskoy Respubliki Vietnam (Agriculture in the Democratic Republic of Vietnam). (In Russian). This is also translated to English by JPRS (No. 4363). 152pp. Moscow, 1959. DNAL 34.5 K14.
- ...Describes the climate and the 2 climatic zones of the Democratic Republic of Vietnam. The source also presents the following tabular data: mean temperatures during the warmest month and the coldest month with range for Hanoi, Thanhhoa, and Dong Hoi; annual mean, mean maximum and minimum, and absolute maximum and minimum temperatures for Hanoi, Fu To, Chonlo, and Cha Pe; monthly and annual mean and mean maximum and minimum temperatures based on the period 1907-1957 for Hanoi, Thanhhoa, Vinh, and Dong Hoi; monthly and annual mean precipitation amount (mm.) and days with rainfall based on the period 1907-1957 for Hanoi, Thanhhoa, Vinh, and Dong Hoi; annual mean rainfall, mean rainfall during rainy years and mean rainfall during dry years for Hanoi, Thanhhoa, Vinh, and Dong Hoi; monthly and annual mean relative humidity for Hanoi, Thanhhoa, Vinh and Dong Hoi. The call number of the translation of this source by JPRS is DNAL 34.5 K14Ae.
229. Paszyński, Janusz Aktynometria w ramach polskiej wyprawy MRG 1957/1958 do Wietnamu (Actinometry in the research work of the Polish expedition to Vietnam, IGY 1957/1958). Acta Geophysica Polonica VII(2):230-236. (In Polish with an English summary). Warszawa, 1959. DWB P.
- ...Gives information about radiation research conducted by the Polish IGY Expedition to Vietnam. The following observations were made at Phu-lien (20.8°N, 106.6°E) and Sa-Pa (22.3°N, 103.8°E): global and diffuse radiation, sunshine, the intensity of direct solar radiation, the intensity of short-wave radiation reflected on surfaces of various types and sporadic measurements of long-wave radiation. These data serve as a basis for research on transparency of the atmosphere. The source also contains a description of the instruments used.
230. Sokhrina, Raisa Fedorovna Davlenie voydukha, temperatura voydukha i atmosferye osadki severnogo polushariia. (Atmospheric pressure, air temperature and precipitation for the northern hemisphere). 474pp. (In Russian). Leningrad, 1959. DWB M82 S683da.
- ...Includes monthly and annual summaries over specified periods (vary by station and element) for approximately 6-45 stations for the following elements: mean station and sea level pressures (mb.); mean temperature (°C); mean total amount of precipitation (mm.).
231. Vietnam (Democratic Republic, 1946- ). Committee for International Geophysical Cooperation Cha-Pa Observatory aerological data, 12 August 1957-31 January 1959. 217pp. Lodz, 1963. DWB M06.7 V666ch.

Source No. 231 continued

...Describes the location of the aerological station, its program of work and the equipment at Cha-Pa. There is also an explanation of the six tables in this publication. The tables include a tabulation in Universal time (0000, 0600, 0200 and 1800) of the radiosoundings and pilot balloon soundings made in Cha-Pa between August 12, 1957 and January 31, 1959; radiosounding data which consist of time from moment of launching, geopotential above sea level in geopotential meters, pressure in millibars, temperature ( $^{\circ}\text{C}$ ), relative humidity and explanatory remarks; upper wind direction and speed at designated hour and specified heights; mean monthly values of geopotential, temperature and humidity on the main isobaric surfaces; statistical data for the main isopotential surfaces; statistical data on the  $0^{\circ}\text{C}$  isotherm.

232. World Weather Records. 4 Volumes. Issuing office varies: Smithsonian Institution as Smithsonian Miscellaneous Collections, volumes 79, 90 and 105 for the first 3 volumes; U. S. Weather Bureau for the 4th volume. Washington, 1927-1959. DWB M06.1 W927wo.

...Presents monthly and annual summaries for each year of total precipitation amount at Laokay (1906-1940), Moncay (1906-1944, 1949, 1950), Phu Lien (1906-1944), Dong Hoi (1941-1950) and Haiphong (Cat-bi) for 1948-1950; mean pressure at station level at Moncay (1907-1944, 1948-1950), Phu Lien (1907-1930), Dong Hoi (1941, 1942, 1948-1950) and Haiphong (1947-1950); mean sea level pressure at Moncay (1941-1944, 1948-1950), Phu Lien (1931-1944) and Dong Hoi (1941, 1942, 1948-1950); mean temperature at Moncay (1907-1930, 1941-1944, 1948-1950), Phu Lien (1907-1944), Dong Hoi (1941-1944, 1947-1950) and Haiphong (1948-1950). There are also monthly and annual summaries over 1-4 specified periods for each station of mean total precipitation at Laokay (1906-1920; 1921-1930; 1931-1940), Moncay (1906-1920; 1921-1930; 1941-1944, 1949, 1950), Phu Lien (1906-1920; 1921-1930; 1931-1940; 1941-1944), Dong Hoi (1941-1950) and Haiphong (1948-1950); mean station level pressure at Moncay (1907-1920; 1921-1930; 1941-1944, 1948-1950), Phu Lien (1907-1920; 1921-1930), Dong Hoi (1941, 1942, 1948-1950) and Haiphong (1947-1950); mean sea level pressure at Moncay (1941-1944, 1948-1950), Phu Lien (1931-1940; 1941-1944), Dong Hoi (1941, 1942, 1948-1950) and Haiphong (1947-1950); mean temperature at Moncay (1907-1920; 1921-1930; 1941-1944, 1949, 1950), Phu Lien (1907-1920; 1921-1930; 1931-1940; 1941-1944), Dong Hoi (1941-1944, 1947-1950) and Haiphong (1948-1950).

1960

233. Chełchowski, Włodzimerz Charakterystyka parności w Cha-Pa i Phu-Lien (The characteristics of sultry weather at Cha-Pa and Phu-Lien). *Przegląd Geofizyczny* 5(4):289-294. (In Polish with a French summary). Warsaw, 1960. DWB M(05) P973a.

...Determines the number of days with sultry weather and the degree of sultriness based on the results of meteorological and katathermometrical observations taken by the Polish expedition into Vietnam during the International Geophysical year 1957-1958 at Cha-Pa and at Phu Lien.

234. Great Britain. Meteorological Office Tables of temperature, relative humidity and precipitation for the world. Part V. Asia. 129pp. London, 1960. DWB M82.2 G786ta.

...Includes tabular monthly and annual data, summarized over the period, for Hanoi, as follows: mean daily extremes and absolute extremes of temperature (33 years) in °F.; mean of the highest and mean of the lowest temperatures (21 years) of each month and the year in °F.; mean relative humidity (21 years) at 1000 and 1600; mean total amount and maximum amount in 24 hours of precipitation (31 years) in inches; mean number of days with precipitation  $\geq 0.04$ " (21 years).

235. Haman, Krzysztof O badaniach naukowych w zakresie aerologii polsko-wietnamskiej stacji naukowej w Cha-Pa. (Scientific investigations in aerology conducted by the Polish Vietnamese Observatory at Cha-Pa during IGY). Przegląd Geofizyczny, Rocznik V (VIII), Zszyt 4, pp.275-288. (In Polish with an English summary). Warszawa, 1960. DWB M(05) P937a.

...Is a review of some scientific problems in aerology investigated by the Polish-Vietnamese Geophysical Station at Cha-Pa; describes the characteristic disturbances in vertical temperature distribution of different altitudes where layers with superadiabatic lapse rate were observed and analyzes the possible reasons for this phenomena.

236. Ramage, C. S. (ed.) Notes on the meteorology of the tropical Pacific and southeast Asia. U.S. Air Force, Cambridge Research Center, Geophysics Research Directorate, Air Force Surveys in Geophysics No. 126. 174pp. Bedford, Massachusetts, June 1960. DWB M(055) U58as.

...On pages 101-120 discusses the synoptic climatology of the China Seas and southeast Asia south of 30°. This report contains the following descriptive data for this area: general climatological information, climatic conditions during the early winter (mid-October to mid-January) and late winter and spring (mid-January to end of April); interruptions of the normal cycle, and clouds and rainfall during the winter monsoon; climatic conditions in early summer (May through late June or early July), early summer disturbances, climatic conditions during mid-summer (late June or early July to mid-July) and late summer and fall (mid-July to early or mid-October), easterly waves (usually in early summer and fall), and clouds and rainfall during the summer monsoon. The appendices consist of reprints of articles by C. S. Ramage. Abstracts of these articles pertaining to that section of southeast Asia which includes North Vietnam appear in this bibliography.

237. Vitviřskiĭ, G. N. Klimaty zarubezhnoi Azii (Climates in Asia outside of the U.S.S.R.). 396pp. (In Russian). Moscow, 1960. DWB M82.1/5 V854k1.

...Includes the following monthly and annual summaries over the period: mean temperature (°C) at Hanoi (1907-1952); mean total amount of precipitation (mm.) at Hanoi (1931-1952); mean maximum and mean minimum temperatures (°C), mean of the highest and mean of the lowest temperatures (°C), mean number of days with precipitation, wind direction frequency, mean relative humidity (%) and mean cloud amount (%) at Hanoi based on data for an unspecified period.

238. Tropical cyclones. Flood Control Journal (ST/ECAFE/SER. C/42). pp.1-5. March 1960. DWB.

...Lists the tropical cyclones according to classification (depression, tropical storm and typhoon), date of occurrence and geographic area affected during 1959. Two of these affected Vietnam.

## 1961

239. Dobby, E. H. G. Monsoon Asia. 381pp. Chicago, 1961. DWB 915 D632mo.

...Contains the following tabular summaries, based on data for an unspecified period, for Hanoi: monthly rainfall amounts; months with temperature means over 50°F.; mid-year daylight hours.

240. Kendrew, W. G. The climate of the continents. Fifth edition. 608pp. Oxford, 1961. DWB M8 K33c.

...In Chapter XXII discusses the air masses and winds, temperature, and rainfall of Indonesia, Borneo, New Guinea and southeast Asia. The author also presents brief notes on the climate of the Philippines and Indochina and numerical values of monthly and annual mean temperature (°F.) and annual range of temperature (°F.) for Hanoi (33 years) on page 287, annual mean and extreme rainfall amounts (inches) for Hanoi (20 years) on page 219, annual absolute extreme temperatures and annual range of temperature for Phu Lien (Haiphong) based on data for an unspecified period, mean and mean daily extreme temperatures for the warmest month and the coolest month at Phu Lien based on data for an unspecified period on page 218, monthly and annual mean total rainfall amount for Hanoi (31 years) on page 225 and temperature range for the warmest month and the coolest month based on data for an unspecified period at Phu Lien on page 218.

241. Miller, A. Austin Climatology. Ninth edition. 320pp. London-New York, 1961. DWB M8 M647c.

...The section in Chapter VIII on the Indo-Chinese Peninsula and the Philippines contains a brief discussion on the climate of Indo-China. The chapter also presents tabular monthly and annual mean temperature, annual range of temperature and monthly and annual mean total amount (inches) of rainfall for Moncai on pp. 158 and 159.

242. Papadakis, Juan Climatic tables for the world. 175pp. Buenos Aires, 1961. DWB M82/2 P213cl.

...Includes the following data for Hanoi: monthly and annual evapotranspiration (cm.); annual humidity index; normal leaching rainfall; maximum leaching rainfall; beginning and end of humid season; beginning and end of dry season; winter severity; summer heat; humidity regime; temperature regime; climatic classification.

## 1962

243. Bagnouls, F. and Gaussen, H. Estação seca e índice xerotérmico (Dry sea-

Source No. 243 continued

son and the xerothermal index). Boletim Geográfico XX(169):337-369. Transcribed from Boletim da Sociedade de História Natural de Tolosa 88:193-239. (In Portuguese). Rio de Janeiro, July-August 1962. DWB P.

...Contains brief notes on the location and geographical characteristics of Indochina and presents graphs showing the monthly distribution of temperature and precipitation (mm) during the dry season at Hanoi and Vinh. The source also contains the following tabular data for Hanoi and Vinh: xerothermal index; number of dry months; names of dry months; total precipitation amount (mm.) during dry months; annual mean total amount of precipitation; mean temperature of the warmer months; annual mean temperature; mean relative humidity during the driest months.

244. Haman, Krzysztof On the superadiabatic lapse rate of temperature in the upper air at Cha-Pa. Acta Geophysica Polonica X(2):101-133. Warszawa, 1962. DWB P.

...The paper deals with the phenomenon of the superadiabatic lapse rate of temperature (abbr. SLR), observed during IGY at the Vietnamese-Polish IGY Observatory Cha-Pa in North Viet-Nam, and its presumable reasons. In the first part of the paper a description and classification of the phenomenon is given, and its relation to season, time of the day, altitude and some meteorological factors are discussed. The main conclusion is to the effect that two groups of SLR may be distinguished - the first group strongly depending on time of day and altitude, the second being independent of these factors. In the second part various possible causes of SLR cases are considered. The main conclusion is that while the second group of SLR cases may be related to various accidental factors of instrumental or semi-instrumental character, the first one may be attributed to the effect of dynamic clear air turbulence (CAT), producing overturning instability in its eddies.

The author

245. Koteswaram, P. Low latitude analysis. Technical Report of the Japan Meteorological Agency, No. 21. Proceedings of the Inter-Regional Seminar on Tropical Cyclones in Tokyo, 18-31 January 1962. pp.245-256. Tokyo, March 1963. DWB M(055) J35rep.

...Recommends different analysis procedures for the tropical area. For the land-sea complexes as southeast Asia the conventional analyses of pressure, temperature, dew point, hydrometeors and constant pressure topography are useful. These should be supplemented by streamline/isotach analyses, particularly over areas with sparsely located rawinsonde stations.

246. Linke, Franz Meteorologisches Taschenbuch (Meteorological handbook). 2nd edition. 806pp. (In German). Leipzig, 1962. DWB M B351m.

...Includes tabular monthly and annual summaries over specified periods of the following: mean pressure and mean temperature for Moncay (1907-1930) and Phulien (1907-1930); mean amount (mm) of precipitation for Laokay (1906-1935), Hanoi (1906-1935), Moncay (1906-1935), and Phulien (1906-1930); mean number of days with precipitation for Hanoi (1907-1927).

247. Michigan. University. Department of Geography Analysis of geographic and climatic factors in coastal southeast Asia. Report No. 04231-1-F. 178pp.

Source No. 247 continued

Ann Arbor, Michigan, March 1962. DWB M(051) M624ana.

...Describes the area used in this study which is a fifty mile strip around the coast of southeast Asia from Pakistan to China. This study contains information on off-shore water depths, coastal type weather analysis, climate and weather, natural vegetation and land cover, generalized patterns of soils, analysis and characteristics of the transportation network, and native animals and diseases of importance to military operations. The chapter on climate and weather gives textual information on the climatic controls (latitude, altitude, and exposure to wind), temperature regimens, rainfall intensity in a day, diurnal distribution of rainfall, rainfall regimens, thunderstorms, and typhoons; analyzes weather stations; presents climatic maps of southeast Asia, graphs showing monthly values of various climatic elements at selected stations, maps of typhoon tracks for Indo-China and the South China Sea, and tabular monthly climatic summaries for individual stations in Laos, Burma, Malaya, Singapore, Thailand, North Vietnam, South Vietnam, and Cambodia. The tabular monthly summaries include the following for 6-11 stations in North Vietnam: mean number of dry days, rainy days, light rainy days (T-0.49"), heavy rainy days (.50-1.99"), and very heavy rainy days (>2.00"); mean number of short dry spell (1-3 days), long dry spells (4 days), short rainy spells (1-3 days), and long rainy spells (4 days); mean number of cool (<70°F.), warm (70-90°F.), and hot (>90°F.) days; 24-hour maximum amount of rainfall; mean, greatest, and least amounts of rainfall; mean maximum and absolute maximum temperatures; means at 0600 and 1300 of temperature and relative humidity; mean number of days suitable for contact flying at 0600 and 1300. This source records data for Moncay, Gowtow, Hanoi, Haiphong, Langson, Phu Lien, Norway Island, Nam Dinh, Thanh Hao, Vinh, and Dong Hoi.

248. Vietnam. Direction de la Météorologie Bulletin mensuel du Temps (Monthly weather bulletin). 1949-... (December 1962). Title and issuing office vary: Indochina, French. Service Météorologique, Résumé mensuel du temps en Indochine for 1949-1953; Vietnam. Service Météorologique, Résumé mensuel du temps en Indochine for 1954; Vietnam. Direction de la Météorologie, Résumé mensuel du temps for 1955-1961. (In Vietnamese and French). Saigon. DWB M06.1/596 V666r.

...See abstract under "Vietnam. Service Météorologique, Résumé mensuel du temps en Indochine". Data for North Vietnam are not recorded after 1954.

1963

249. Heyer, Ernst Witterung und Klima; eine allgemeine Klimatologie (Weather and climate; a general climatology). 439pp. (In German). Leipzig, 1963. DWB M8 H615w.

...Includes a graph showing the monthly values of mean temperature (°C) and mean total amount of precipitation (mm) for Hanoi based on data for an unspecified period. The source also presents numerical values of annual mean temperature, mean total precipitation and temperature range for the same station.

250. Nuttonson, Michael Y. The physical environment and agriculture of Vietnam, Laos and Cambodia. 137pp. Washington, 1963. DWB M:63 N988phv.

...Lists the three types of weather stations (meteorological, climatological, and pluviometric) of Indochina; gives textual information on temperature, pressure, winds, precipitation, winter monsoon (mid-September to March), summer monsoon (June-September), local winds, typhoons, rainfall, snow, hail and humidity for Indochina; includes the tabular distribution of the number of typhoons by month over Indochina and the South China Sea based on data over a 10-year period; contains annual mean and extreme rainfall amounts, summarized over a 22-year period for Moncay, Lang Son, Chapa, Hanoi, Phu Lang Thuong, Phu Lien, Thanh Hoa, Vinh, and Dong Hoi; describes the climate of Vietnam.

251. U. S. Weather Bureau Daily series, synoptic weather maps. Pt. II. Northern Hemisphere data tabulations. 1959-...(December 1963). DWB M09.2/7 U587daa.

...Presents coded surface synoptic observations (Nddff VVww PPPTT N<sub>h</sub>CLhOmCH T<sub>d</sub>T<sub>d</sub>ja<sub>j</sub>pp 7RRRjj) at 1200 GCT for at least 4 stations (Moncay, Hanoi, Dong Hoi and Thanh Hoa) in North Vietnam for varying periods of record. The regularity of reports for each station has not been determined.

1964

252. Bucknell, J. Climatology. 163pp. London, 1964. DWB M8 B925c.

...On pages 67-71 presents brief notes on the monsoon climates of Indochina and the Philippines.

253. Tanner, Gilbert A Collection of selected climographs. 45pp. Eau Claire, Wisconsin, January 1964. DWB M82.3 T166c.

...Includes a climograph for Hanoi. The data appearing on this climograph include name of station; coordinates and elevation; Köppen's classification with Trewartha's modification of climate; numerical values of annual mean total amount of rainfall, annual range of temperature and annual mean temperature; location of station on map of continent; curves of monthly values of mean temperature and mean total rainfall amount. Period of record is not specified.

254. U. S. Air Weather Service. First Weather Wing Climate of North Vietnam. Special Study 105-4. San Francisco, September 1964. DWB M(055) U58s.

...Describes the location, topography and climate of North Vietnam; discusses the climatic controls, general weather phenomena, special weather phenomena and seasonal weather; contains climatic briefs and terrain maps. The tables present monthly and annual summaries over specified periods (vary by station and element) at 2-17 stations in North Vietnam of mean and maximum days with crachin weather, mean temperatures (°F), mean and absolute extreme temperatures, mean and extreme amounts of precipitation (inches), maximum amount of precipitation in 24 hours, mean number of days with precipitation, mean and mean minimum relative humidities (%), mean cloud amount (%), mean number of days with thunderstorms at 0600 and 1300, mean number of days with fog at 0600 and 1300, mean number of days with total cloud amount  $\leq 3/10$  and  $\geq 7/10$  at 0600 and 1300, mean number of days with low cloud amount  $\leq 3/10$  and  $\geq 7/10$  at 0600 and 1300,

Source No. 254 continued

prevailing wind direction (16 points), mean wind speed (knots), prevailing wind speed at 0600 and 1300, terminal weather (ceiling  $\geq$  1000 ft., visibility  $\geq$  2 1/2 mi) in % at 0600 and 1300 and mean pressure (mbs); seasonal (north-east monsoon, spring, southeast monsoon and autumn) mean winds (degrees and knots) and temperatures over North Vietnam at heights of 5000-ft. intervals from 5,000 to 60,000 ft.

255. U. S. Air Weather Service. First Weather Wing Climatic data summaries for selected Asian and Pacific stations. Special Study 105-3. San Francisco, July 1964. DWB M(055) U58s.

...Includes tabular monthly and annual summaries over the period (23-48 years) at 1-2 stations (Hanoi and Phu Lien) in North Vietnam of mean and absolute extreme temperatures; mean total precipitation amount; mean total snowfall amount; maximum amount of precipitation in 24 hours; maximum amount of snowfall in 24 hours; mean number of days with precipitation  $\geq$  .005", measurable snow, snowfall  $\geq$  2.5", thunderstorms and fog; number of typhoons; flying weather (VFR, IFR and closed) in %; mean relative humidity; mean sea level pressure (mbs); mean vapor pressure (inches Mercury); maximum snow depth (inches); 99.95% pressure altitude (feet). The table also presents monthly (January, April, July and October) mean dew point for Hanoi and Phu Lien.

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