LARGE SCALE WEATHER SITUATIONS IN HUNGARY AND THE PERIODICAL COMPONENTS OF THEIR TIME ARRAY

by

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Magyarország makroszinoptikus helyzetei idősorának periodikus összetevői. Dolgozatunkban azon kérdésekre kívántunk választ kapni, hogy a Magyarország éghajlatát meghatározó légköri folyamatok időbeli menetében kimutathatók-e ritmikus változások; a légköri folyamatok hogyan kapcsolódnak a mérsékelt öv atlanti-óceáni térségének áramlási rendszeréhez, valamint arra, hogy milyen összefüggesek rejlenek az északi félteke atlanti-óceáni ill. csendes-óceáni hatásközpontjai között.

In present work it was tried to find the answer if there could be detected a rhytmical alteration in the chronologic line of atmospherical processes determining the climate of Hungary; how these atmospherical processes connect to the circulation system of the Atlantic territory of the temperate zone and what kind of relations can be detected between the Atlantic and Pacific centres of influence of the northern hemisphere.

The rhytms of large scale weather situations in Hungary

In the first part of the present work it was examined if there were alterations meaning periodicity in the time arrays of large scale weather situations which determine the circulation above the Carpathian Basin and were characteristic of Hungary. The basic material for this analysis was constituted by the frequency time array of 100 years between 1877 and 1976, based on the catalogue [4] of large scale weather situations established for Hungary. The yearly, winter and summer halfyear frequencies of individual large scale weather situations were established for each day of that period while the frequency values of large scale weather situations which can be corresponded to the main circulation phases served as the basis of analysis *(Table 1, 2, 3)*.

As a preliminary the main circulation types in the territory of Hungary will be surveyed:

A: Situations in connection with zonal western circulation (Circulation phase I.) *(zC; As; Aw)*

B: Situations in connection with meridional orientation (Circulational phase II.)
Within these situations there are two groups according to their appearing with a northern *(mCc; AB; CMc)* or with a southern air current *(mCw; Ae; CMw)* respectively.

C: Situations in connection with zonal eastern circulation (Circulation phase III. *(AF; An)*

D: Central large scale weather situations
During the life of these the middle part of either an anticyclon *(A)* or that of a cyclon can be found above the Carpathian Basin.

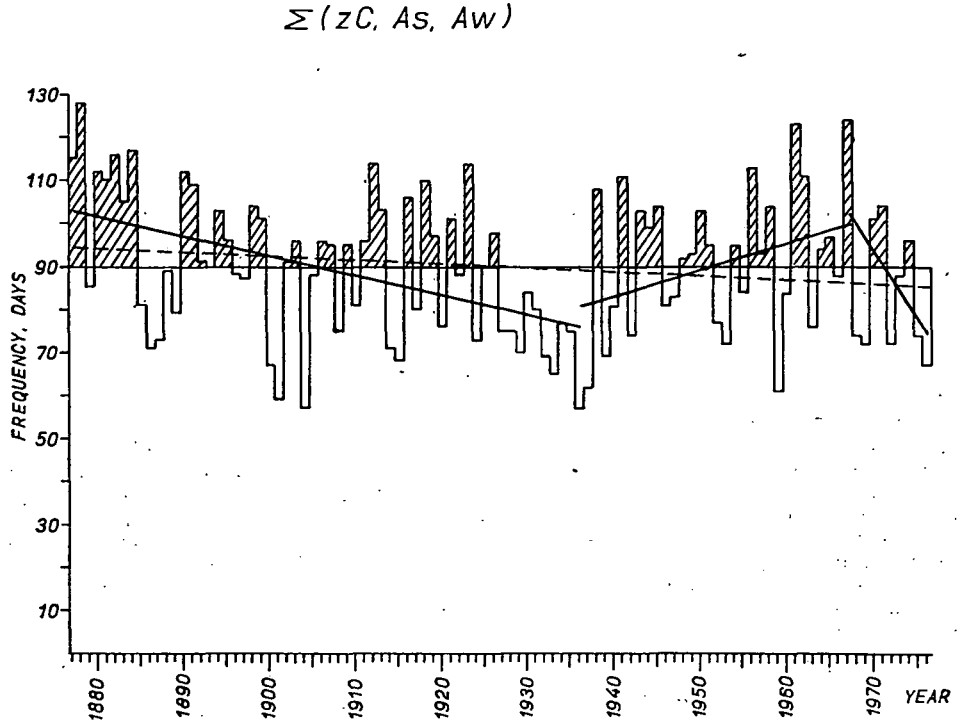

Fig. 1. Frequency and trends of weather situations of western direction

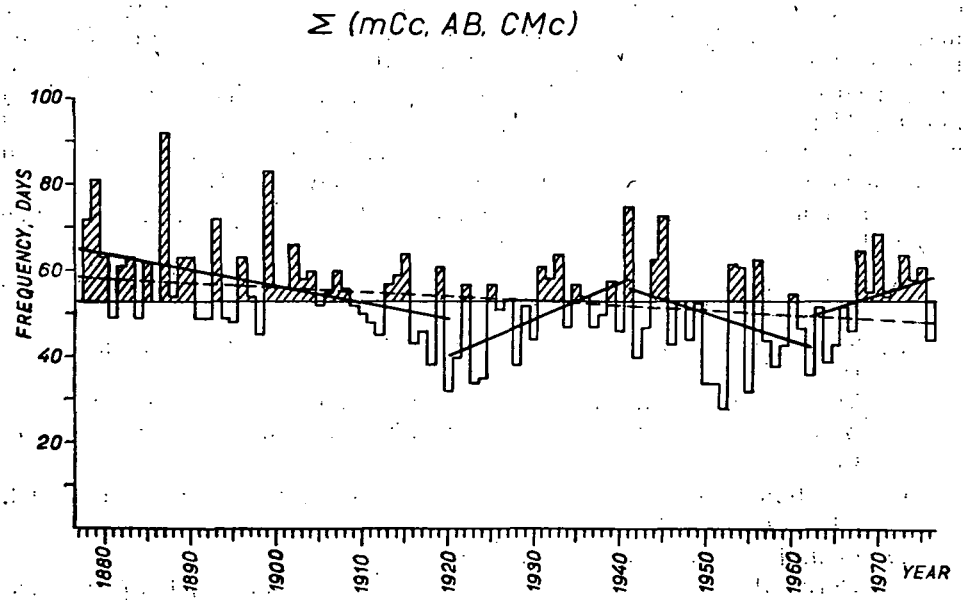

Fig. 2. Frequency and trends of weather situations of northern direction

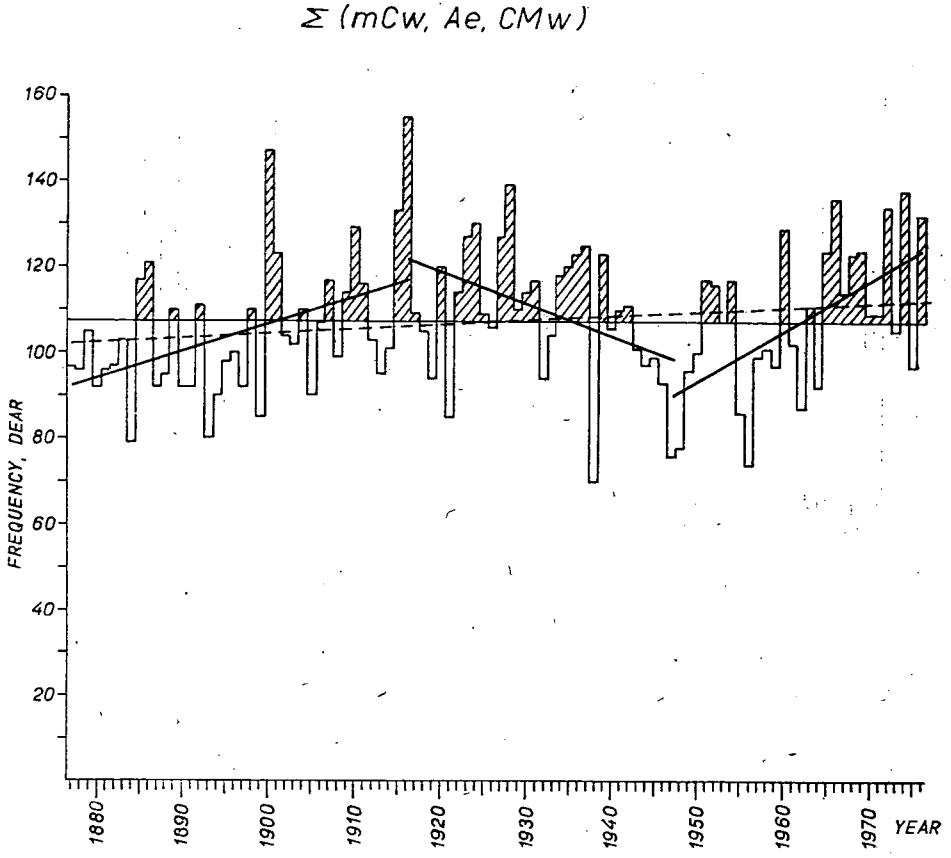

Fig. 3. Frequency and trends of weather situations of southern direction

The frequency values of the western *(Fig. 1)*, the northern *(Fig. 2)*, the southern *(Fig. 3)*, the eastern orientation *(Fig. 4)* and the anticyclon central situations *(Fig. 5)* are displayed based on the frequency time arrays of *Table 1*. The yearly incidence values of large scale weather situations of zonal and meridional currents with jointly discussed western and eastern circulation are displayed on *Fig. 6*, those with northern and southern circulation on *Fig. 7*. Since cyclon central situations are scarcely occurring circulation types, these were omitted from the analysis. On the figures the freqency mean values were indicated as well as the trend straights of individual groups referring to the examined hundred years long period or shorter periods depending on the line of frequency values. The rise of the trend straights (dotted line) calculated for the hundred years long period is rather low, which means that there is no powerful and steady unidirectional tendency in the line of frequency values of the individual situation groups during this period *(Table 4)*. Within the individual situation groups the line of trend straights indicated on the basis of the line of frequency values with a pair-wise correlation of the individual groups appears contrasting which is evident. This negative connection is apparent in the western and eastern, in the western and suothern, in the southern and anticyclonic central situations especially,

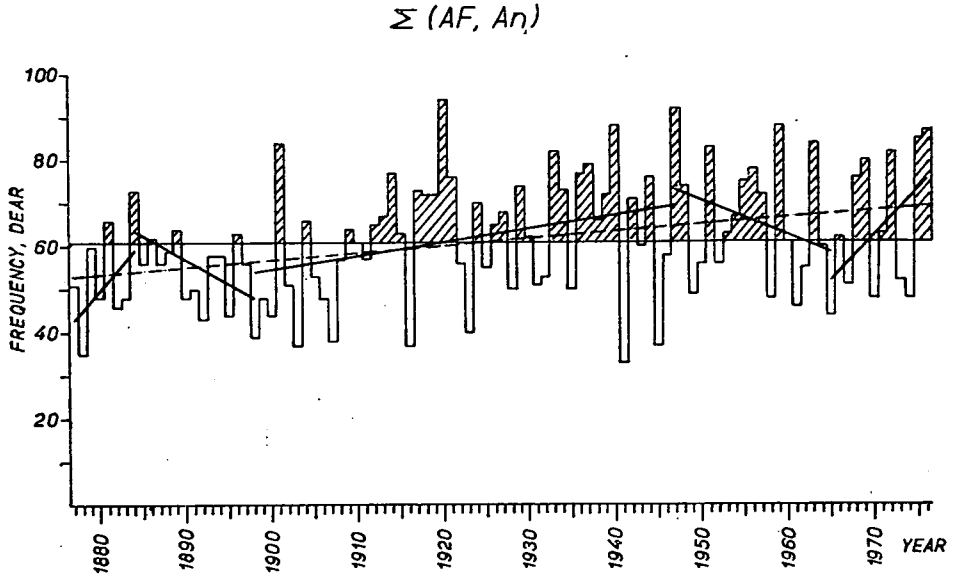

Fig. 4. Frequency and trends of weather situations of eastern direction

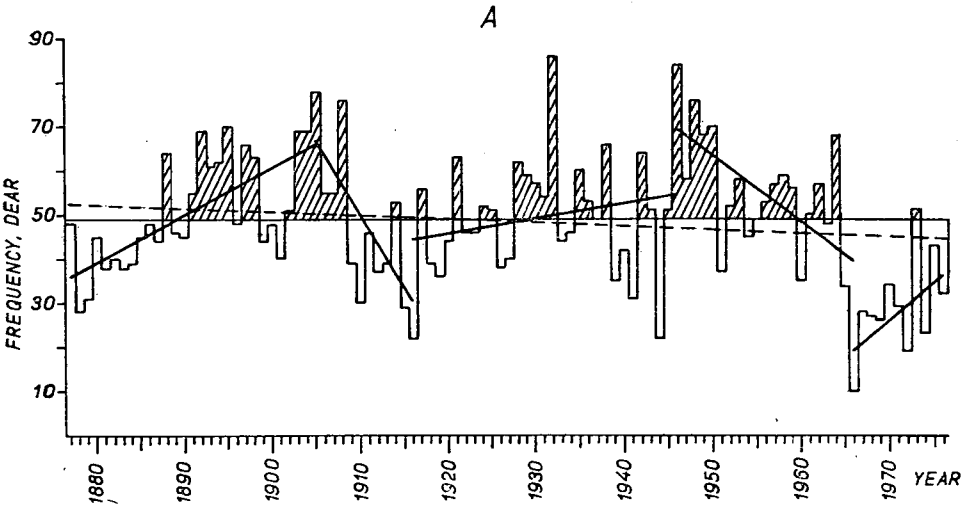

Fig. 5. Frequency and trends of the anticyclon centre weather situations

as well as in the contractionally originating situation groups with zonal and meridional orientation (correlation coefficient = −0,6307) conferring to the datas of Table 5.

Subsequently with the help of harmonic analysis the amplitudes and phase angles of periodicities of the series were calculated, which unambiguously determine the periodical waves. If the frequency values of the large scale weather situation group are denoted with a "y", with a "t" the length of time, the function describing the periodical alteration is the following:

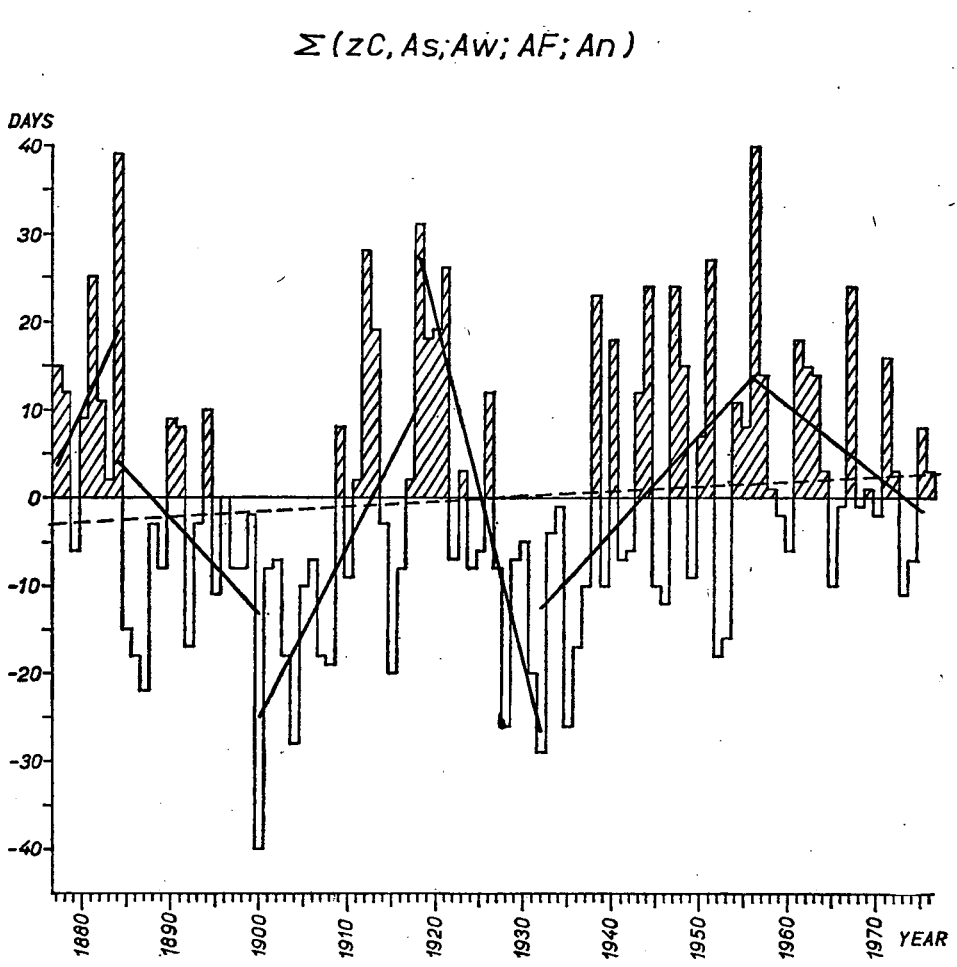

Fig. 6. Collective frequency and trends of weather situations of western and eastern directions. Zonal types

$$y = M + A \cdot \sin\left[\frac{2\pi}{T} \cdot t + U\right]$$

M is the mean value of the given situation group for this period, A is the amplitude. U is the phase angle of the wave [5]. To express the amplitude the A/E values were determined where E (expectancy) is the same as the expected values of the amplitudes. If A/E values are written in a function of the period length, the so-called periodgram curve or periodspectrum is obtained.

During this survey those periods were considered as statistically still acceptable, where A/E was superiour to 1,5 (which means that the probability that the respective period originates from a casual grouping of datas is less than 0,17). Considering this statement the periodgrams of southern orientation and anticyclon central situations indicated a definite period and a closer relation. The 3, 5 and 13 years long periods in

the periodspectrum of situations with southern orientation completely correspond to the periodseries of precipitation [1], [2], of water-level [2], [3] in Hungary *(Fig 8)*. The periodgram of the anticyclon central situations shows a five years long periodicity and a quite powerful 13—14 years long periodicity *(Fig. 9)* conforming to the above-mentioned precipitation and water-level series. The situations with a southern orientation beside those with a western orientation are to bring the most rainfall in the country. Their rule in determining precipitation and water-level series in Hungary — which is assuered by a coinciding period — is best reflected if the previously indi-

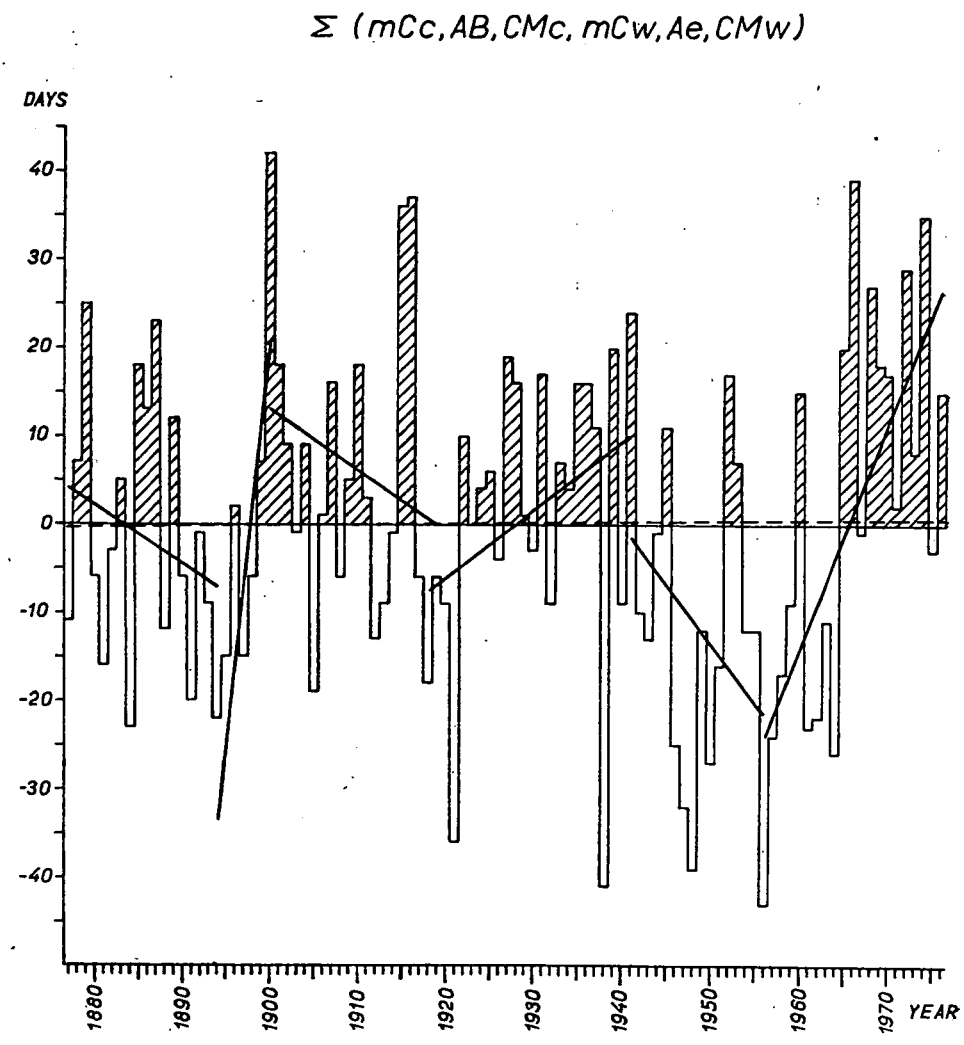

Fig. 7. Collective frequency and trends of weather situations of northern and southern directions. Meridional types

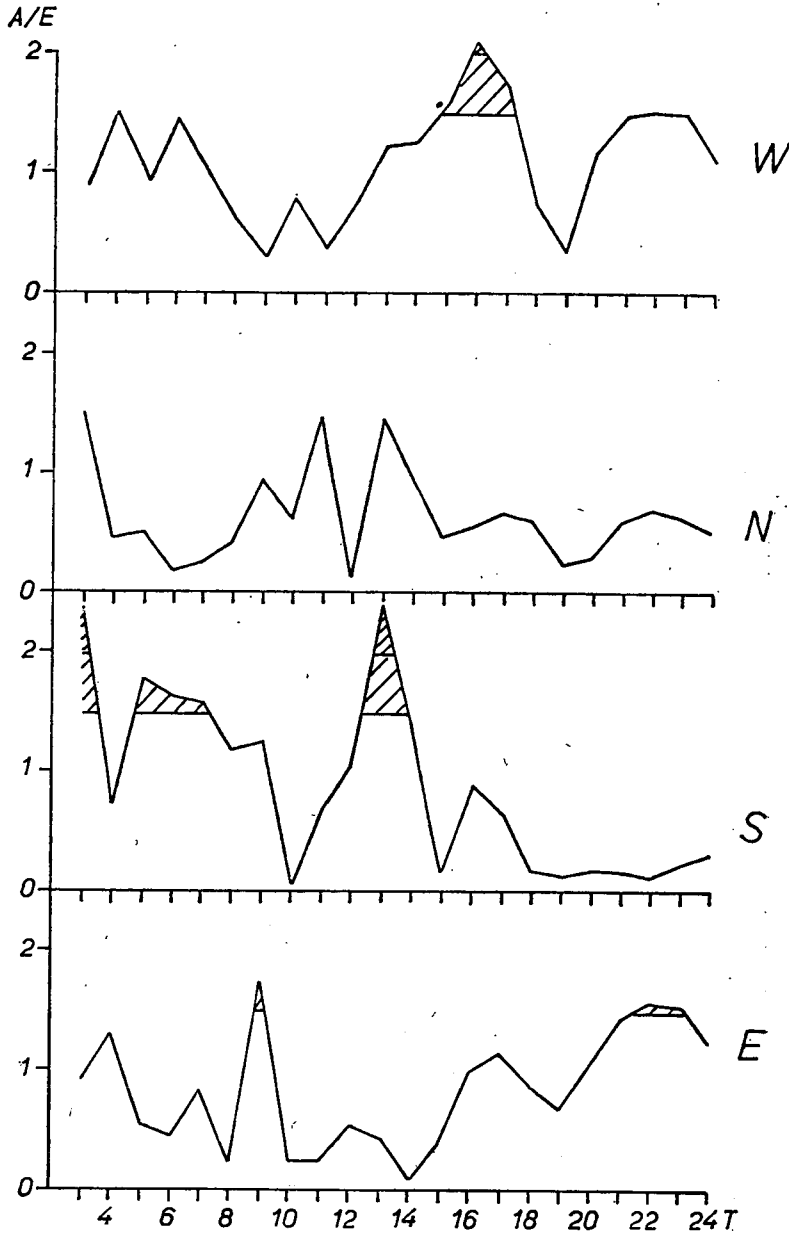

Fig. 8. Periodgrams of weather situations of zonal and meridional directions

cated periods possess contrasting phases between the situations with southern orientation and the anticyclon central situations which is shown in the values of phase angles:

	S	A	Δ
5 years long period	204°	37°	167°
13 years long period	163°	332°	169°
14 years long period	250°	85°	165°

From this chart it can be immediately seen that the phase angles of the examined situations during the given periods are contrasting, they show a difference of almost 180°.

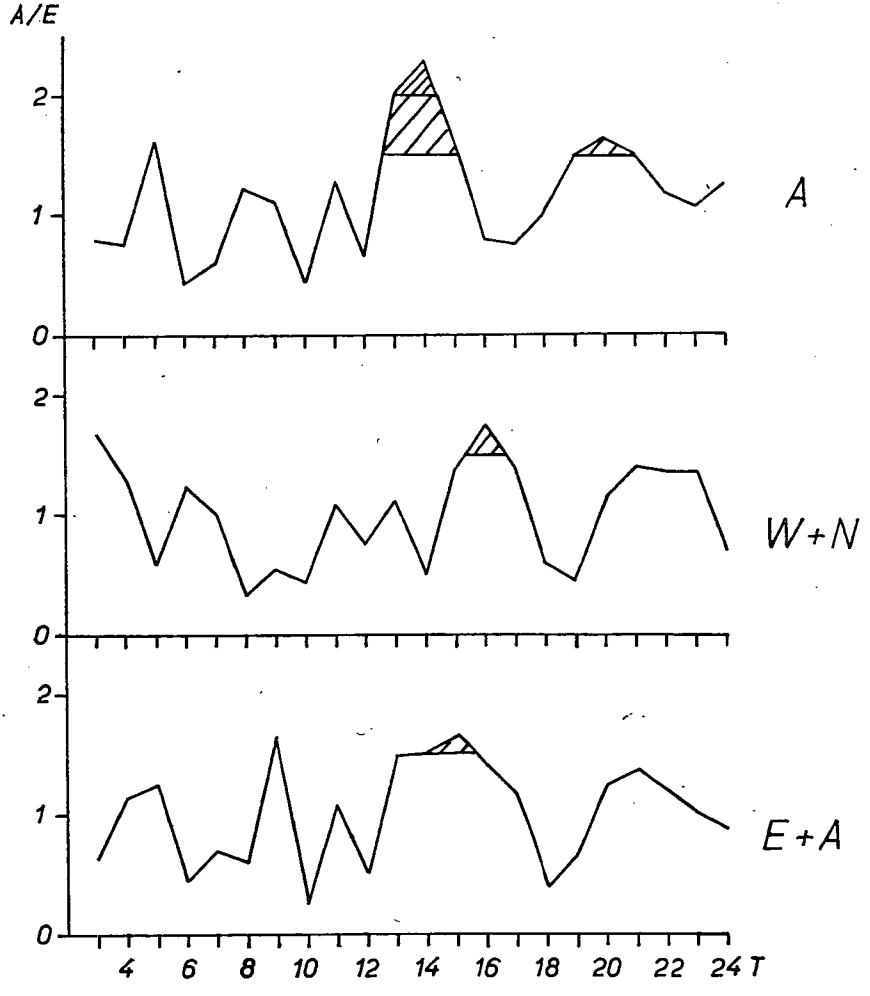

Fig. 9. Periodgrams of the anticyclon centre situations and that of the reduced groups of weather situations

On the basis of the periodspectrums and correlation calculations it can be stated that there is a reciprocal connection between the individual situations which is most characteristic between the situations with western and eastern orientation and the situation groups with zonal and meridional orientation. There is no sharp similarity between the periods of the individual situations however, and where a closer relation can be observed — first of all at the peak values of periodgrams —, there the periods are of contrasting phases.

The rhytms of influence centres of the temperate zone

In the circulation structure of the temperate zone there are certain periods which need a closer analysis comprehensing a more extensive territory in order to be able to interpret them. Consequently it is expedient to search for the reasons of periodical

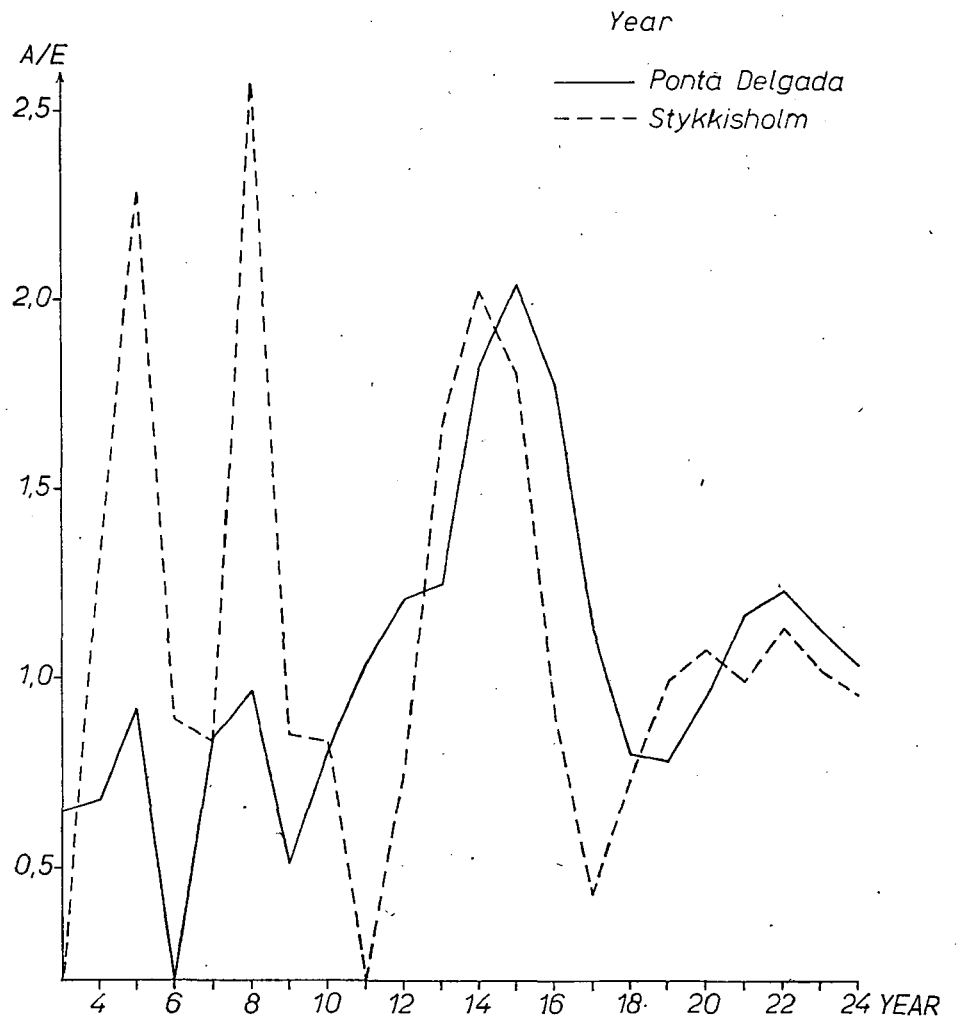

Fig. 10. Periodgrams of action centres of the Atlantic Ocean (year)

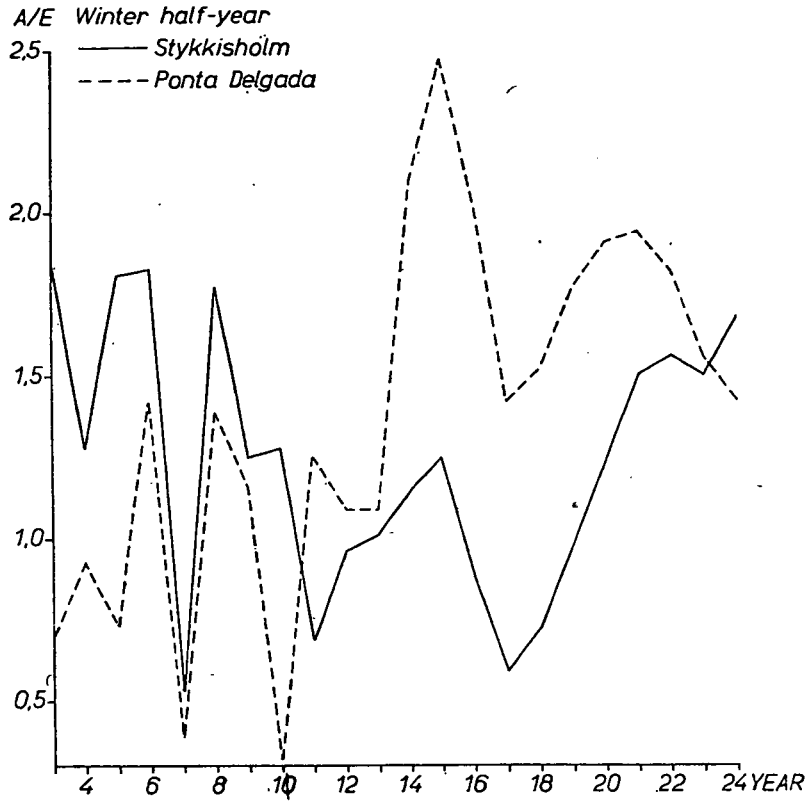

Fig. 11. Periodgrams of action centres of the Atlantic Ocean (winter halfyear)

frequency of large scale weather situations characteristic of Hungary by maens of the exploration and processing of the birthplaces of these positions, by analysing the thermodynamic characteristics of the influence centres of the Atlantic Ocean, since these centres of action determine the intensity of zonal circulation. Additionally a study of factors in connection with the activity and relation of the Atlantic and Pacific Ocean influence centres of the temperate zone was included.

The basis of elaboration was constituted by the following set of datas: in the case of Atlantic influence centres Stykkisholm on the Icelandic territory with low air pressure, 67 years long, between 1894—1960 time array of monthly mean air pressures and that of station Ponta Delgada which is under the influence of the Azores barometrical maximum while a 44 years long, between 1917—1960, similar time array was analysed in the territory of the Pacific Ocean, as a low air-pressure influence centre Dutch Harbor, as a high one Honolulu station was chosen in Hawai and Aleut respectively *(Table 6 and 7)*.

With the method of harmonic analysis the time arrays of yearly, summer and winter air-pressure mean values measured at the representative stations of the Atlantic centres of action were processed, and the periods apparent in the values were plotted on *Fig. 10, 11 and 12.* The periodgrams of pressure differences of respective time arrays of Stykkisholm and Ponta Delgada stations were plotted considering the

same three instances. In the periodgrams of pressure differences the phase angle differences belonging to still realistic periods (A/E is superior to 1,5) mostly values around 180° are obtained. Which means that western circulation is much more prevalent in the mentioned circulations. With a more detailed analysis of the periodgram of the time array including the yearly Δ p values of Atlantic centres of influence a definite 5 years and 13 years long periods as well as a rather strong 8 years long and a 14—15 years long periods are found.

This analysis of periodicity on the basis of yearly mean air-pressure values of Atlantic and Pacific centres of influence could register an identical and significant 13—14 years long periods only in the case of centres with low air-pressure, that is, in the case of Aleuti and Icelandic stations.

This direct relation between the two centres of action, as a consequency of the shape of the Earth — might be promoted by the lesser distance between them comparing to centres of high pressure.

Summing up it can be stated that there are no sharp similarities in the periods of large scale weather situation groups determining the climate of Hungary. While there are characteristic 5 and 13—14 years long periods int he periodspectrums of anticyclon central situations and those with a southern orientation. These periods are identical with the 5 and 15 years periods in the periodgram of time array of yearly mean rainfall, elaborated on the basis of data from 10 Hungarian stations between 1871 and 1972. The more powerful rule of the situations with southern orientation in the precip-

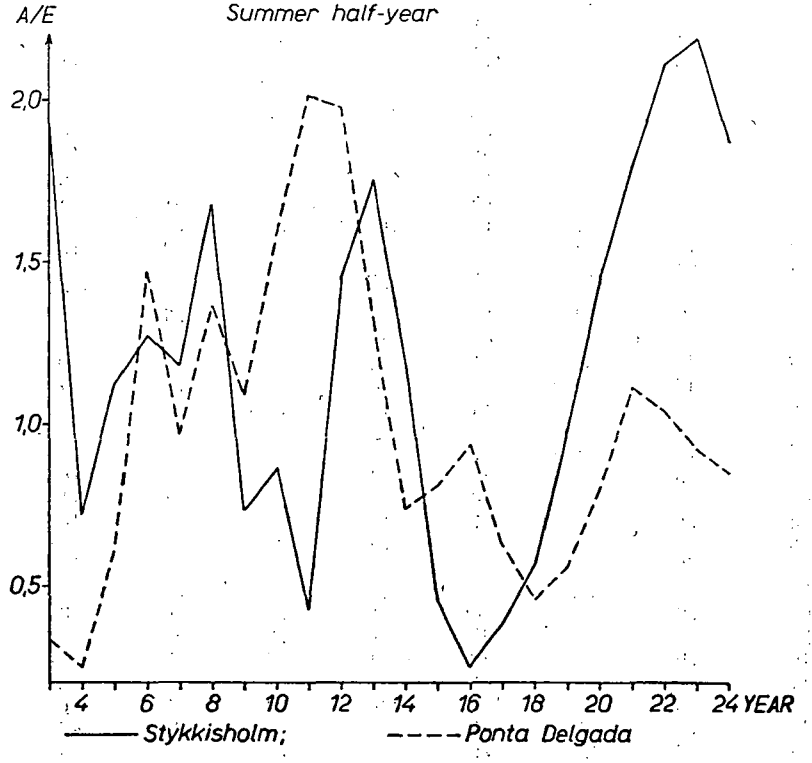

Fig. 12. Periodgrams of action centres of the Atlantic Ocean (summer halfyear)

itation supply of Hungary is confirmed by their contrasting phase with the anticyclonic situations beside the identical periods of the respective time arrays. The periods appearing in the periodspectrum of the time array including the yearly Δ p values of Atlantic centres of influence are similar to the periods of time array of rainfall in question. The almost identical phase angle values belonging to the 14 years long period of above-mentioned time arrays mean that the majority of rainfall happened in connection with air currents originating at the Atlantic Ocean, at least that was the case during the indicated 14 years long period.

These 13—14 years long periods are characteristic not only of the yearly mean rainfall line in Hungary and in the circulation relations of the North-Atlantic territory which determines the previous, but in the circulation structure in connection with the low air-pressure centres of action on the northern hemisphere as well.

Table 1/a

Annual frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*zC*	*As*	*Aw*	Summ.	*mCc*	*AB*	*CMc*	Summ.
1877	26	34	55	115	31	9	13	53
1878	21	32	75	128	38	14	20	72
1879	15	15	55	85	44	25	12	81
1880	31	33	48	112	27	31	5	63
1881	25	26	59	110	29	16	4	49
1882	27	19	70	116	25	29	7	61
1883	21	34	50	105	33	21	9	63
1884	15	34	68	117	19	19	11	49
1885	22	16	43	81	28	25	9	62
1886	18	19	34	71	20	23	10	53
1887	12	17	44	73	38	45	9	92
1888	22	29	38	89	25	16	13	54
1889	17	9	53	79	25	22	16	63
1890	31	33	48	112	27	31	5	63
1891	22	20	67	109	23	20	6	49
1892	15	21	55	91	18	19	12	49
1893	26	26	38	90	29	37	6	72
1894	17	31	55	103	18	25	6	49
1895	19	24	53	96	12	25	11	48
1896	23	19	46	88	21	35	7	63
1897	19	19	49	87	27	17	10	54
1898	13	16	75	104	11	27	7	45
1899	24	36	41	101	28	42	13	83
1900	17	12	38	67	19	17	20	56
1901	19	8	32	59	31	19	6	56
1902	36	17	38	91	33	17	16	66
1903	33	39	24	96	34	13	11	58
1904	24	13	20	57	19	27	14	60
1905	22	9	57	88	20	25	7	52
1906	28	13	55	96	18	24	13	55
1907	11	22	62	95	32	25	3	60
1908	20	21	34	75	22	26	8	56
1909	31	17	47	96	28	20	4	52
1910	29	15	37	81	24	19	7	50
1911	27	24	45	96	11	35	2	48
1912	28	38	48	114	24	15	6	45
1913	24	39	40	103	22	23	12	57
1914	22	23	26	71	22	32	5	59
1915	15	16	37	68	31	23	10	64

Year	*zC*	*As*	*Aw*	Summ.	*mCc*	*AB*	*CMc*	Summ.
1916	25	26	55	106	20	17	6	53
1917	14	26	40	80	11	30	5	46
1918	17	42	51	110	8	26	4	38
1919	18	28	51	97	20	30	11	61
1920	10	21	45	76	16	16	—	32
1921	17	40	44	101	21	18	1	40
1922	19	17	52	88	26	21	10	57
1923	23	30	61	114	22	7	5	34
1924	25	12	36	73	22	7	6	35
1925	36	26	28	90	36	17	4	57
1926	33	27	38	98	18	27	6	51
1927	22	19	34	75	22	24	7	53
1928	17	22	36	75	14	15	9	38
1929	17	17	36	70	15	31	6	52
1930	44	10	30	84	17	20	7	44
1931	22	21	37	80	23	33	5	61
1932	16	19	34	69	23	28	7	58
1933	17	21	27	65	23	37	4	64
1934	16	16	45	77	17	28	2	47
1935	20	13	42	75	21	25	11	57
1936	9	10	38	57	30	16	8	54
1937	22	11	29	62	24	12	11	47
1938	16	28	64	108	16	28	6	50
1939	12	24	33	69	20	16	22	58
1940	24	15	42	81	21	15	10	46
1941	24	32	55	111	39	26	10	75
1942	12	17	45	74	17	17	6	40
1943	29	9	65	103	26	15	6	47
1944	35	9	55	99	41	16	6	63
1945	31	30	43	104	27	33	13	73
1946	21	11	49	81	14	24	5	43
1947	27	15	41	83	22	23	8	53
1948	25	20	47	92	24	14	6	44
1949	17	9	67	93	27	23	3	53
1950	31	9	63	103	19	7	8	34
1951	22	14	59	95	10	8	10	28
1952	23	7	47	77	20	24	18	62
1953	15	11	46	72	13	33	15	61
1954	24	6	65	95	18	6	8	32
1955	29	7	48	84	34	22	10	63
1956	27	24	62	113	10	21	13	44
1957	26	12	55	93	22	9	7	38
1958	32	24	48	104	29	3	11	43
1959	12	14	35	61	17	31	7	55
1960	29	12	43	84	31	7	9	47
1961	28	19	76	123	9	21	6	36
1962	28	16	67	111	25	15	12	52
1963	20	10	46	76	11	18	10	39
1964	14	10	70	94	15	19	9	43
1965	21	15	61	97	19	24	14	57
1966	11	16	61	88	26	16	22	64
1967	18	25	81	124	14	20	12	46
1968	17	16	41	74	33	24	8	65
1969	13	10	49	72	22	9	24	55
1970	15	18	68	101	35	17	17	69
1971	15	10	79	104	17	28	9	54
1972	16	14	42	72	14	29	13	56
1973	20	6	62	88	18	32	14	64
1974	19	21	56	96	29	15	14	58
1975	8	12	54	74	12	39	10	61
1976	6	9	52	67	17	20	7	44

Table 1/b

Annual frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1877	50	33	14	97	6	45	51	48	1
1878	47	37	12	96	7	28	35	28	5
1879	47	41	17	105	14	46	60	31	3
1880	35	42	15	92	20	28	48	45	6
1881	32	50	14	96	29	37	66	38	6
1882	47	31	19	97	24	22	46	40	5
1883	36	56	11	103	13	35	48	38	8
1884	23	33	23	79	19	54	73	39	8
1885	61	39	17	117	2	53	55	45	5
1886	45	47	29	121	21	41	62	48	10
1887	36	31	25	92	9	47	56	44	7
1888	37	36	22	95	32	27	59	64	5
1889	37	47	26	110	27	37	64	46	3
1890	35	42	15	92	21	27	48	45	6
1891	37	39	16	92	14	36	50	55	10
1892	39	50	22	111	6	37	43	69	2
1893	25	39	16	80	27	31	58	61	4
1894	17	50	23	90	17	40	58	62	3
1895	39	33	26	98	11	33	44	70	9
1896	27	47	26	100	7	59	63	48	4
1897	29	39	24	92	24	32	56	66	10
1898	40	53	17	110	14	25	39	63	4
1899	30	31	25	85	18	30	48	44	4
1900	44	66	37	147	13	31	44	48	3
1901	42	49	22	123	40	44	84	40	3
1902	33	46	25	104	27	24	51	51	2
1903	39	36	27	102	16	21	37	69	3
1904	25	60	25	110	20	46	66	69	4
1905	29	40	21	90	9	44	53	78	4
1906	38	38	31	107	25	23	48	55	4
1907	30	62	25	117	8	30	38	55	—
1908	31	48	20	99	25	32	57	76	3
1909	51	48	15	114	9	55	64	39	1
1910	43	62	24	129	4	57	61	30	6
1911	36	62	18	116	13	44	57	46	1
1912	45	42	16	103	18	47	65	37	2
1913	31	51	13	95	21	46	67	39	4
1914	46	41	14	101	30	47	77	53	4
1915	48	57	28	133	14	49	63	29	8
1916	64	76	15	155	15	22	37	22	3
1917	44	38	27	109	25	48	73	56	1
1918	32	53	20	105	17	55	72	39	1
1919	47	21	26	94	22	50	72	36	5
1920	28	35	7	70	20	74	94	44	1
1921	27	42	16	85	19	57	76	63	—
1922	54	37	23	114	12	44	56	46	4
1923	59	45	23	127	18	22	40	46	4
1924	44	70	16	130	23	47	70	52	6
1925	52	33	24	109	21	34	55	51	3
1926	43	40	23	106	13	52	65	38	7
1927	58	49	20	127	30	38	68	40	2
1928	51	68	20	139	16	34	50	62	2
1929	34	61	15	110	13	61	74	59	—
1930	46	39	29	114	24	38	62	57	2
1931	51	44	22	117	14	37	51	54	2
1932	40	45	9	94	20	33	53	86	6

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1933	33	43	28	104	44	38	82	44	6
1934	56	46	16	118	13	60	73	46	4
1935	41	49	30	120	28	22	50	60	3
1936	53	47	23	123	40	37	77	53	2
1937	60	44	21	125	23	56	79	49	3
1938	25	30	15	70	16	50	66	66	5
1939	36	50	37	123	24	48	72	35	8
1940	36	46	24	106	35	53	88	42	3
1941	48	43	19	110	2	31	33	31	5
1942	31	69	11	111	23	48	71	64	5
1943	17	69	15	101	5	55	60	51	3
1944	56	32	9	97	7	69	76	22	6
1945	35	39	25	99	15	22	37	51	1
1946	19	47	27	93	8	50	58	84	6
1947	18	38	20	76	44	48	92	58	3
1948	19	39	20	78	19	55	74	76	2
1949	23	63	10	96	4	45	49	68	6
1950	43	27	30	100	14	41	55	70	3
1951	39	51	27	117	14	69	83	37	5
1952	53	38	25	116	18	38	56	52	3
1953	17	70	20	107	13	50	63	58	4
1954	45	43	29	117	21	46	67	45	9
1955	28	42	16	86	19	56	75	49	8
1956	20	40	14	74	38	40	78	53	4
1957	33	55	11	99	16	56	72	57	6
1958	45	38	18	101	2	46	48	59	11
1959	25	51	21	97	26	62	88	56	8
1960	57	39	33	129	14	47	61	35	10
1961	35	44	23	102	7	39	46	50	8
1962	17	37	33	87	9	46	55	57	3
1963	34	50	27	111	13	71	84	48	7
1964	26	43	23	92	9	51	60	68	9
1965	53	40	31	124	13	31	44	34	9
1966	56	38	42	136	14	48	62	10	5
1967	37	57	20	114	6	45	51	28	2
1968	48	53	22	123	16	60	76	27	1
1969	51	40	33	134	14	66	80	26	8
1970	62	24	23	109	9	39	48	34	4
1971	30	45	34	109	10	53	63	29	6
1972	15	84	35	134	15	67	82	19	3
1973	29	49	27	105	12	40	52	51	5
1974	33	74	31	138	5	43	48	23	2
1975	31	47	19	97	17	68	85	43	5
1976	38	70	24	132	28	59	87	32	4

Table 2/a

Winter half-yearly frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*zC*	*As*	*Aw*	Summ.	*mCc*	*AB*	*CMc*	Summ.
1877—78	8	14	32	54	13	10	8	31
1878—79	5	12	29	46	21	2	9	32
1879—80	5	8	15	28	10	35	4	49
1880—81	23	18	26	67	14	7	2	23
1881—82	5	9	38	52	5	8	2	15
1882—83	14	16	16	46	12	7	3	22
1883—84	15	19	30	64	6	4	3	13
1884—85	7	18	20	45	5	10	1	16
1885—86	8	9	8	25	12	3	7	22

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1886—87	4	11	4	29	14	15		3	32
1887—88	12	14	16	42	15	8		9	32
1888—89	11	12	15	38	10	8		8	26
1889—90	5	6	18	29	4	15		2	21
1890—91	20	21	31	72	8	7		4	19
1991—92	13	12	10	35	12	14		3	29
1892—93	11	20	15	46	8	9		4	21
1893—94	10	13	31	54	5	7		2	14
1894—95	12	7	14	33	8	5		5	18
1895—96	14	15	18	47	6	18		3	27
1896—97	18	5	21	44	9	8		1	18
1897—98	7	10	31	48	5	6		4	15
1898—99	7	26	11	44	11	15		5	31
1899—00	1	5	25	31	7	6		11	24
1900—01	9	13	10	32	7	4		6	17
1901—02	13	11	21	45	13	13		5	31
1902—03	10	32	13	55	7	6		5	18
1903—04	15	8	6	29	10	7		2	19
1904—05	16	8	16	40	8	17		6	31
1905—06	16	11	27	54	10	14		4	28
1906—07	13	1	26	40	11	15		5	31
1907—08	10	14	5	29	11	6		4	21
1908—09	10	—	14	24	5	9		2	16
1909—10	17	8	14	39	4	13		4	21
1910—11	14	7	19	40	12	16		1	29
1911—12	17	18	14	49	3	2		2	7
1912—13	12	29	14	55	1	11		3	15
1913—14	25	16	18	59	9	7		1	17
1914—15	5	8	11	24	13	9		5	27
1915—16	18	13	22	53	6	2		6	14
1916—17	8	14	14	36	2	6		4	12
1917—18	7	30	18	55	5	10		2	17
1918—19	9	9	4	22	2	10		3	15
1919—20	17	9	21	47	11	9		4	24
1920—21	4	16	17	37	5	2		—	7
1921—22	16	14	12	42	11	6		6	23
1922—23	7	6	19	32	12	10		3	25
1923—24	14	6	5	25	18	2		7	27
1924—25	11	16	16	43	2	5		—	7
1925—26	18	7	8	33	7	10		7	24
1926—27	4	15	15	34	9	9		5	23
1927—28	10	8	7	25	4	11		3	18
1928—29	2	9	7	18	8	15		5	28
1929—30	11	7	7	25	3	8		4	15
1930—31	15	5	9	29	12	11		4	27
1931—32	5	11	11	27	5	28		—	33
1932—33	3	9	9	21	6	9		2	17
1933—34	6	8	11	25	—	13		3	16
1934—35	11	11	18	40	5	6		5	16
1935—36	5	5	10	20	4	3		6	13
1936—37	11	9	12	32	8	4		10	22
1937—38	9	16	30	55	7	18		2	27
1938—39	9	16	21	46	9	6		10	25
1939—40	7	15	10	32	12	—		9	21
1940—41	17	9	10	36	9	8		6	23
1941—42	11	14	12	37	10	7		2	19
1942—43	12	12	20	46	6	6		2	14
1943—44	20	4	32	56	20	2		2	24
1944—45	23	20	16	59	6	11		5	22
1945—46	16	14	6	36	13	21		1	35
1946—47	7	6	9	22	7	10		7	24

Year	*zC*	*As*	*Aw*	Summ.	*mCc*	*AB*	*CMc*	Summ.
1947—48	21	12	24	57	10	16	4	30
1948—49	7	6	24	37	11	8	—	19
1949—50	18	7	19	44	10	4	4	18
1950—51	16	6	17	39	6	2	9	17
1951—52	8	9	22	39	12	10	8	30
1952—53	15	8	17	40	6	19	17	42
1953—54	6	5	8	19	4	5	3	12
1954—55	19	4	19	42	16	2	5	23
1955—56	21	9	19	49	6	10	6	22
1956—57	6	16	20	42	2	6	3	11
1957—58	13	11	21	45	6	1	11	18
1958—59	6	8	16	30	12	8	2	22
1959—60	9	6	13	28	2	—	6	8
1960—61	14	11	40	65	3	1	7	11
1961—62	8	12	22	42	10	14	2	26
1962—63	5	3	8	16	4	9	6	19
1963—64	12	3	19	34	6	8	3	17
1964—65	7	5	21	33	5	21	10	36
1965—66	15	12	27	54	11	9	11	31
1966—67	7	13	31	51	9	5	3	17
1967—68	16	15	38	69	16	7	2	25
1968—69	3	8	16	27	6	2	9	17
1969—70	15	6	16	37	8	3	10	21
1970—71	4	15	33	52	8	9	9	26
1971—72	9	9	32	50	1	9	3	13
1972—73	8	9	29	46	4	22	5	31
1973—74	12	10	25	47	6	6	2	14
1974—75	3	22	32	57	16	3	8	27
1975—76	4	5	35	44	6	12	2	20
1976—77	8	7	17	32	6	10	5	21

Table 2/b

Winter half-yearly frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1877—78	15	25	9	49	2	22	24	24	—
1878—79	32	31	11	47	7	12	19	7	3
1879—80	6	20	7	33	5	25	30	43	—
1880—81	26	27	4	57	6	12	18	17	—
1881—82	11	26	9	46	9	9	18	49	2
1882—83	26	46	8	80	10	12	22	10	2
1883—84	14	36	6	56	1	19	20	24	5
1884—85	16	25	15	56	1	41	42	22	1
1885—86	27	27	17	71	8	30	38	19	7
1886—87	28	16	13	57	11	24	35	27	2
1887—88	23	14	25	62	8	7	15	28	4
1888—89	14	30	11	55	11	11	22	38	3
1889—90	11	36	12	59	10	16	26	48	—
1890—91	17	14	12	43	—	11	11	35	2
1891—92	22	42	9	73	5	18	23	19	2
1892—93	13	32	11	56	7	21	28	29	2
1893—94	8	35	7	50	9	14	23	39	2
1894—95	21	21	27	69	4	26	30	25	7
1895—96	14	19	9	42	6	21	27	38	2
1896—97	20	35	14	69	3	24	27	22	2
1897—98	16	32	10	58	15	5	20	41	—
1898—99	16	25	12	53	9	8	17	36	1
1899—00	28	35	22	85	3	12	15	25	2

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1900—01	19	28	21	68	5	22	27	37	1
1901—02	29	31	12	72	3	14	17	16	1
1902—03	8	25	17	50	16	12	28	31	—
1903—04	20	45	22	87	4	21	25	23	—
1904—05	12	27	14	53	8	23	31	26	1
1905—06	20	21	16	57	—	14	14	26	3
1906—07	18	26	12	56	9	21	30	24	1
1907—08	22	46	13	81	8	13	21	31	—
1908—09	17	26	16	59	9	30	39	44	—
1909—10	30	37	15	82	3	22	25	15	—
1910—11	13	47	12	72	4	20	24	17	—
1911—12	32	43	11	86	7	15	22	18	1
1912—13	19	31	5	55	7	20	27	30	—
1913—14	18	15	8	41	4	16	20	44	1
1914—15	38	36	12	86	5	23	28	14	3
1915—16	26	41	15	82	7	16	23	8	3
1916—17	36	30	22	88	7	21	28	18	—
1917—18	13	24	12	49	2	35	37	24	—
1918—19	36	39	16	91	6	34	40	12	2
1919—20	21	31	12	64	—	30	30	15	3
1920—21	17	46	5	68	7	29	36	34	—
1921—22	11	23	17	51	5	18	23	41	2
1922—23	25	35	10	70	8	23	31	21	3
1923—24	41	23	13	77	6	21	27	24	3
1924—25	15	41	15	71	7	19	26	35	—
1925—26	22	27	12	61	2	33	35	29	—
1926—27	43	27	13	83	4	14	18	20	4
1927—28	18	46	15	79	16	20	36	24	1
1928—29	23	28	14	65	13	27	40	31	—
1929—30	27	59	12	98	—	17	17	25	2
1930—31	27	28	23	78	7	17	24	23	1
1931—32	10	35	9	54	7	20	27	42	—
1932—33	17	47	13	77	9	22	31	33	3
1933—34	28	25	18	71	3	34	37	30	3
1934—35	22	36	14	72	13	20	33	20	1
1935—36	35	53	27	115	4	12	16	18	1
1936—37	28	37	13	78	—	21	21	26	3
1937—38	17	15	7	39	3	30	33	28	—
1938—39	16	30	15	61	4	16	20	27	3
1939—40	9	36	20	65	20	16	36	25	3
1940—41	29	26	19	74	8	22	30	15	4
1941—42	10	34	14	58	13	30	43	22	3
1942—43	6	46	4	56	—	27	27	37	2
1943—44	13	25	7	45	5	30	35	20	3
1944—45	29	14	14	57	5	28	33	9	2
1945—46	16	27	16	59	5	20	25	25	2
1946—47	20	31	22	73	12	25	37	22	4
1947—48	7	11	18	36	10	22	32	27	1
1948—49	7	30	2	39	7	27	34	52	1
1949—50	12	34	14	60	11	27	38	20	2
1950—51	33	24	33	90	2	14	16	17	3
1951—52	24	23	14	61	8	25	33	19	1
1952—53	23	15	17	55	4	24	28	15	2
1953—54	12	63	10	85	11	27	38	28	—
1954—55	21	24	15	60	1	33	34	22	1
1955—56	11	30	5	46	19	26	45	16	5
1956—57	13	21	11	45	19	22	41	40	3
1957—58	20	25	11	56	4	26	30	30	3
1958—59	22	36	8	66	1	18	19	42	3
1959—60	16	44	18	78	6	35	41	24	4
1960—61	35	15	19	69	4	11	15	16	6

1961—62	24	24	15	63	8	25	33	13	5
1962—63	14	17	31	62	5	47	52	32	1
1963—64	16	27	10	53	6	26	32	44	3
1964—65	14	29	23	66	1	23	24	21	3
1965—66	27	15	12	54	5	24	29	11	3
1966—67	30	37	20	87	2	19	21	5	1
1967—68	19	30	8	57	—	13	13	19	—
1968—69	23	30	17	70	7	45	52	14	2
1969—70	30	22	20	72	2	35	37	11	4
1970—71	18	13	22	53	5	27	32	17	2
1971—72	4	59	22	85	3	19	22	12	1
1972—73	6	41	13	60	4	28	32	12	1
1973—74	14	53	13	80	1	18	19	22	—
1974—75	17	26	15	58	2	18	20	19	1
1975—76	8	38	10	56	5	34	39	22	2
1976—77	31	58	17	106	—	10	10	10	3

Table 3/a

Summer half-yearly frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*zC*	*As*	*Aw*	Summ.	*mCc*	*AB*	*CMc*	Summ.
1877	7	21	36	64	18	9	7	34
1878	12	13	43	68	20	3	7	30
1879	13	8	34	55	23	2	6	31
1880	13	11	20	44	20	15	5	40
1881	11	22	43	76	19	9	2	30
1882	16	3	33	52	17	22	3	42
1883	9	22	27	58	22	14	7	43
1884	6	8	37	51	16	13	8	37
1885	14	4	33	51	13	16	6	35
1886	10	6	27	43	15	15	5	35
1887	8	9	23	40	19	31	1	51
1888	11	13	26	50	15	12	9	36
1889	8	6	37	51	16	15	7	38
1890	13	11	20	44	20	15	5	40
1891	11	8	50	69	16	8	2	26
1892	5	10	38	53	10	10	7	27
1893	14	9	18	41	19	29	4	52
1894	6	17	33	56	14	16	4	34
1895	6	7	40	53	4	19	4	27
1896	11	15	25	51	15	18	6	39
1897	3	9	28	40	18	9	7	34
1898	5	9	45	59	6	21	3	30
1899	18	10	22	50	15	25	9	49
1900	12	1	24	37	13	17	6	36
1901	7	2	15	24	24	10	2	36
1902	22	8	22	52	20	6	10	36
1903	28	1	14	43	22	4	9	35
1904	5	9	14	28	11	17	6	34
1905	8	—	34	42	11	5	5	21
1906	10	7	32	49	11	19	7	37
1907	6	12	43	61	21	12	2	35
1908	10	16	23	49	15	15	4	34
1909	11	12	33	56	21	12	—	33
1910	17	6	24	47	22	9	4	35
1911	12	16	28	56	5	19	2	26
1912	11	13	28	52	22	13	1	36
1913	8	21	24	53	19	14	11	44
1914	7	13	19	39	14	23	5	42
1915	5	7	26	38	15	17	2	34

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1916	8	11	28	47	19	13		1	33
1917	6	15	23	44	7	23		1	31
1918	12	19	42	73	4	15		3	22
1919	3	15	43	61	10	20		5	35
1920	2	9	29	40	14	12		—	26
1921	4	22	22	48	9	16		1	26
1922	10	9	37	56	16	5		1	21
1923	6	22	48	76	8	6		1	15
1924	18	11	28	57	13	3		3	19
1925	15	10	18	43	30	11		—	41
1926	26	13	20	59	12	18		1	31
1927	22	10	26	58	12	8		1	21
1928	5	9	26	40	9	12		5	26
1929	15	9	28	52	10	16		3	29
1930	26	5	22	53	13	10		1	24
1931	14	12	30	56	12	17		5	34
1932	10	15	23	48	16	6		5	27
1933	14	10	18	42	21	27		1	49
1934	9	8	26	43	16	17		1	34
1935	10	3	32	45	15	21		5	41
1936	5	4	25	34	24	9		1	34
1937	8	2	22	32	19	2		2	23
1938	8	6	30	44	9	19		2	30
1939	4	5	17	26	6	11		11	28
1940	12	6	30	48	13	14		5	32
1941	5	16	40	61	25	14		5	44
1942	5	8	35	48	11	10		4	25
1943	15	3	43	61	18	14		4	36
1944	10	3	28	41	23	13		2	38
1945	15	5	29	49	19	10		9	38
1946	11	2	42	55	4	9		3	16
1947	9	7	22	38	11	8		1	20
1948	13	8	29	50	20	6		4	30
1949	4	2	45	51	13	17		—	30
1950	16	6	40	62	9	3		3	15
1951	6	3	37	46	4	8		3	15
1952	9	3	33	45	8	13		3	24
1953	10	1	34	45	10	11		5	26
1954	13	3	42	58	7	5		7	19
1955	4	3	34	41	17	13		3	33
1956	16	8	44	68	9	12		7	28
1957	17	3	33	53	17	8		5	30
1958	23	11	35	69	19	2		—	21
1959	4	8	17	29	12	24		5	41
1960	13	—	29	42	27	7		—	34
1961	19	11	38	68	7	10		3	20
1962	20	8	47	75	15	9		7	31
1963	8	4	32	44	7	10		4	21
1964	9	7	50	66	8	4		4	16
1965	10	8	39	57	13	7		7	27
1966	4	9	33	46	14	11		11	36
1967	7	3	38	48	5	13		10	28
1968	6	5	17	28	16	18		6	40
1969	7	2	33	42	21	8		12	41
1970	2	4	43	49	23	10		7	40
1971	8	—	35	43	14	16		2	32
1972	7	6	30	43	10	18		10	38
1973	7	3	28	38	12	13		9	34
1974	16	1	25	42	16	15		9	40
1975	4	—	30	34	5	26		6	37
1976	1	—	25	26	13	10		5	28

Table 3/b

Summer half-yearly frequency of large-scale weather situations of Hungary, days (1877—1976)

Year	*mCw*	*Ae*	*CMw*	Summ	*AF*	*An*	Summ.	*A*	*C*
1877	26	10	1	37	4	20	24	23	1
1878	20	14	5	39	7	20	27	17	2
1879	30	20	7	57	7	20	27	10	3
1880	22	15	12	49	16	18	34	10	6
1881	12	13	4	29	14	20	34	10	4
1882	20	6	12	38	19	18	37	10	4
1883	22	9	3	34	7	19	26	18	4
1884	11	8	10	29	19	24	43	18	5
1885	34	12	7	53	1	19	20	21	3
1886	13	23	11	47	8	16	24	31	3
1887	22	16	5	43	3	26	29	15	4
1888	14	21	6	41	15	17	32	20	4
1889	23	6	11	40	20	22	42	12	—
1890	22	15	12	49	16	18	34	10	6
1891	18	9	4	31	14	19	33	17	7
1892	19	14	6	39	1	14	15	49	—
1893	14	10	7	31	18	15	33	25	1
1894	10	17	10	37	11	18	29	25	2
1895	13	19	6	38	2	10	12	51	2
1896	12	18	16	46	5	29	34	10	3
1897	19	7	10	36	10	24	34	31	8
1898	16	21	7	44	6	18	24	22	4
1899	20	7	11	38	11	19	30	13	3
1900	13	29	11	53	13	18	31	25	1
1901	25	19	4	48	35	27	62	12	1
1902	15	22	11	48	11	6	17	28	2
1903	23	6	9	38	12	12	24	40	3
1904	13	20	7	40	13	17	30	48	3
1905	14	19	9	42	5	24	29	47	2
1906	16	7	10	33	19	12	31	31	2
1907	13	18	14	45	—	7	7	35	—
1908	14	22	8	44	16	13	29	24	3
1909	20	18	1	39	6	29	35	19	1
1910	22	16	9	47	—	32	32	16	6
1911	17	12	5	34	9	31	40	26	1
1912	18	13	7	38	11	31	42	14	1
1913	16	30	11	57	14	29	43	13	4
1914	16	15	6	37	22	22	44	18	3
1915	19	25	8	52	7	29	36	20	3
1916	32	28	2	62	11	16	27	12	2
1917	16	20	2	38	22	11	33	36	1
1918	18	14	12	44	15	17	32	12	—
1919	9	3	10	22	16	21	37	27	1
1920	15	29	—	44	14	35	49	23	1
1921	13	14	9	36	16	41	57	16	—
1922	31	13	7	51	7	26	33	20	2
1923	22	21	8	51	11	6	17	23	1
1924	25	19	7	51	11	18	29	24	3
1925	27	15	5	47	19	18	37	12	3
1926	15	7	13	35	13	20	33	20	5
1927	23	20	3	46	17	26	43	15	—
1928	24	20	10	54	6	14	20	42	1
1929	13	13	3	29	3	38	41	32	—
1930	23	6	10	39	24	18	42	23	2
1931	29	10	3	42	3	24	27	23	1
1932	28	7	2	37	14	6	20	46	5

Year	*mCw*	*Ae*	*CMw*	Summ.	*AF*	*An*	Summ.	*A*	*C*
1933	14	5	5	24	35	13	48	19	1
1934	26	11	5	42	13	27	40	21	3
1935	22	6	8	36	15	6	21	38	2
1936	22	5	8	35	36	18	54	24	2
1937	26	13	6	45	21	28	49	34	—
1938	12	14	6	32	12	32	44	29	4
1939	24	18	18	60	13	33	46	20	3
1940	19	12	7	38	17	31	48	15	2
1941	27	15	4	46	2	12	14	17	1
1942	21	32	1	54	10	16	26	28	2
1943	9	19	8	36	3	19	22	26	2
1944	25	25	1	51	2	38	40	11	2
1945	23	14	7	44	11	7	18	34	—
1946	6	17	6	29	1	23	24	57	2
1947	3	22	4	29	29	31	60	35	1
1948	11	16	7	34	8	28	36	32	1
1949	11	26	1	38	4	21	25	36	3
1950	22	9	5	36	3	18	21	47	2
1951	13	18	10	41	7	46	53	25	3
1952	21	20	6	47	13	20	33	34	—
1953	12	24	11	47	8	25	33	28	4
1954	23	9	14	46	12	15	27	25	8
1955	11	13	5	29	19	26	45	31	4
1956	15	22	2	39	6	13	19	27	2
1957	14	20	7	41	7	31	38	17	4
1958	18	12	3	33	—	28	28	26	6
1959	7	9	9	25	24	34	58	24	6
1960	21	19	8	48	10	26	36	20	3
1961	14	18	12	44	—	17	17	31	3
1962	4	18	8	30	2	18	20	26	1
1963	15	28	9	52	10	31	41	20	5
1964	13	19	7	39	2	24	26	31	5
1965	29	14	17	60	11	8	19	15	5
1966	22	12	17	51	10	25	35	10	5
1967	21	24	13	58	5	32	37	11	1
1968	28	24	11	63	11	31	42	9	1
1969	24	14	13	51	10	21	31	14	4
1970	37	10	6	53	7	16	23	18	1
1971	19	28	7	54	7	28	35	14	5
1972	9	15	20	44	8	38	46	10	2
1973	18	15	15	48	11	22	33	26	4
1974	18	17	16	51	5	25	30	19	1
1975	20	13	6	39	15	39	54	16	3
1976	18	22	9	49	23	37	60	17	3

Table 4

Trends of the large-scale weather situations

			„I"
Year	*y(zC,As,Aw)*	= −0,090x + 94,31	−0,1
	y(mCc,AB,CMc)	= −0,099x + 58,69	−0,184
	y(mCw,Ae,CMw)	= 0,104x + 101,97	0,097
	y(AF,An)	= 0,158x + 53,38	0,257
	y(A)	= −0,075x + 52,31	0,155
	y(zC,As,Aw,Af,An)	= 0,067x + 147,1	0,045
	y(mCc,AB,CMc,mCw, Ae,CMw)	= 0,005x + 160,67	0,003
Winter half-year	*y(zC,As,Aw)*	= −0,023x + 41,62	
	y(mCc,AB,CMc)	= −0,027x + 23,16	
	y(mCw,Ae,CMw)	= 0,064x + 61,87	
	y(AF,An)	= 0,077x + 24,00	
	y(A)	= −0,096x + 29,84	
Summer half-year	*y(zC,As,Aw)*	= −0,063x + 52,53	
	y(mCc,AB,CMc)	= −0,073x + 35,71	
	y(mCw,Ae,CMw)	= 0,049x + 39,87	
	y(AF,An)	= 0,069x + 29,91	
	y(A)	= 0,014x + 22,84	

„I": factors of x in the unit of mean annual frequency of the given large-scale weather situations

Table 5

Correlation coefficients between large-scale weather situations

	W	N	S	E	A
W	1,0000	−0,0947	−0,3973	−0,5022	−0,1354
N		1,0000	−0,1561	−0,2669	−0,2350
S			1,0000	−0,0483	−0,4709
E				1,0000	−0,1339
A					1,0000

Table 6

Means of air pressure at sea level in the north region of the Atlantic Ocean (900 mb+)

	Year		Summer half-year		Winter half-year	
	S.	P.	S.	P.	S.	P.
1894	102,4	121,4	110,4	122,6	—	—
95	107,9	117,8	108,8	120,7	105,5	116,4
96	105,1	122,4	109,1	124,0	100,7	118,8
97	105,9	121,2	108,2	122,3	103,4	120,3
98	102,4	119,8	107,0	119,6	101,0	119,9
99	107,0	118,4	111,0	122,4	101,1	115,2
1900	106,8	121,5	109,2	122,4	105,8	117,6
01	106,8	120,3	106,8	121,6	102,8	119,2
02	108,6	119,2	114,8	120,0	106,2	119,5
03	103,8	121,5	111,4	121,6	93,6	120,4
04	103,6	121,2	107,9	122,3	99,9	121,9
05	105,5	121,9	110,4	122,3	100,7	121,0
06	104,7	122,8	110,2	122,2	100,3	125,2
07	104,8	123,0	111,2	121,4	99,1	125,2
08	104,6	123,1	110,4	122,3	99,6	125,2
09	107,0	120,3	110,7	122,2	100,8	119,8

	Year		Summer half-year		Winter half-year	
	S.	P.	S.	P.	S.	P.
1910	105,9	122,7	112,3	122,7	97,2	121,8
11	105,4	121,6	109,9	121,9	104,7	121,0
12	105,9	121,0	112,7	122,6	100,6	117,8
13	102,7	122,3	109,8	123,6	95,1	121,9
14	103,5	122,2	108,7	123,9	98,0	121,1
15	109,8	119,8	113,1	121,4	101,4	119,2
16	107,2	120,8	111,8	121,6	105,4	120,0
17	111,1	121,2	113,0	121,0	107,6	118,0
18	106,2	121,5	110,7	122,6	105,1	121,5
19	107,6	121,5	109,5	123,1	104,7	120,4
1920	102,2	122,2	108,6	121,9	103,1	123,9
1921	103,9	122,4	110,2	122,3	97,0	121,2
22	104,8	122,8	108,8	124,7	98,2	122,0
23	104,3	122,8	109,1	123,1	102,0	120,3
24	105,1	120,2	110,2	122,0	103,0	119,0
25	105,9	121,0	107,0	123,6	97,6	122,4
26	105,6	120,2	108,7	120,3	103,8	116,4
27	106,8	120,7	111,0	121,8	102,0	122,6
28	104,2	121,5	110,2	119,0	102,2	119,4
29	106,3	120,3	111,1	122,2	105,4	119,2
1930	104,4	121,8	109,2	122,0	97,2	121,6
31	106,6	120,6	111,8	121,8	101,6	121,0
32	107,6	121,0	111,4	123,1	102,8	118,0
33	107,1	121,2	109,8	122,7	99,8	120,0
34	104,0	122,0	108,2	121,9	103,4	123,2
35	105,6	123,0	110,6	122,6	101,1	121,0
36	107,4	120,4	110,7	122,3	105,1	117,2
37	104,6	118,8	105,1	121,0	99,2	121,0
38	101,8	122,8	109,5	123,1	101,8	119,8
39	107,6	121,0	111,9	121,1	96,6	121,8
1940	107,9	119,8	109,5	122,0	108,2	117,1
41	109,4	120,3	111,2	121,9	107,6	119,6
42	106,2	119,9	108,6	121,9	104,6	118,3
43	103,5	123,4	108,2	123,8	99,1	120,4
44	105,8	121,5	109,8	121,5	102,0	121,6
45	107,0	119,2	108,8	120,4	101,6	123,1
46	105,2	122,3	107,6	123,9	103,9	117,6
47	108,7	119,0	106,6	122,6	108,0	115,8
48	104,7	120,8	111,0	122,7	103,0	119,2
49	104,8	121,9	111,1	122,0	99,4	120,3
1950	104,4	121,2	107,4	121,9	98,8	121,0
1951	105,0	121,0	111,2	120,4	103,5	120,8
52	109,0	121,0	111,6	122,2	100,6	120,4
53	103,9	121,0	110,8	122,2	105,2	119,8
54	103,9	123,9	110,8	124,3	96,4	122,0
55	109,0	119,0	107,2	122,8	103,1	117,5
56	107,0	121,9	111,6	123,2	107,8	117,4
57	107,0	121,0	114,6	122,6	98,6	119,9
58	109,0	119,9	113,1	121,9	104,2	117,2
59	103,9	121,9	108,7	122,3	101,1	120,8
1960	107,9	119,9	109,9	122,8	103,0	117,8

S.: Stykkisholm
P.: Ponta Delgada

Table 7

Means of air pressure at sea level in the north region of the Pacific Ocean (900 mb +)

	Year		Summer half-year		Winter half-year	
	D.	H.	D.	H.	D.	H.
1917	107,7	117,2	110,3	118,3	—	116,8
1918	107,2	115,7	111,7	115,5	106,5	115,6
1919	106,4	117,2	111,1	116,9	97,0	118,0
1920	108,6	116,5	112,6	116,4	108,2	115,9
1921	106,8	116,8	110,0	116,9	103,1	116,9
1922	107,4	117,2	112,2	117,2	103,4	117,0
1923	105,0	116,1	108,5	116,7	103,7	116,0
1924	106,2	117,4	110,3	117,4	97,5	117,0
1925	104,4	116,6	109,3	117,0	103,3	117,0
1926	93,4	116,8	109,3	116,7	92,7	116,5
1927	106,0	116,6	108,7	116,7	99,4	116,7
1928	102,3	117,4	108,2	116,1	102,4	116,9
1929	104,1	115,8	107,2	116,8	97,9	116,7
1930	108,6	116,1	112,2	116,6	105,2	114,8
1931	105,7	117,1	112,6	116,7	97,4	117,5
1932	107,0	116,6	109,9	117,4	105,5	115,6
1933	109,8	117,5	111,5	118,3	103,8	116,8
1934	104,4	116,8	109,3	116,9	104,4	116,7
1935	108,3	115,9	111,8	116,7	103,1	116,1
1936	106,4	116,0	109,1	116,7	106,0	114,5
1937	108,1	116,4	109,3	117,3	106,2	115,5
1938	102,9	116,0	106,5	116,2	101,9	115,8
1939	106,6	116,4	110,8	116,6	98,7	116,4
1940	102,6	114,7	106,3	115,6	99,6	114,6
1941	103,4	116,5	108,9	116,2	97,1	116,0
1942	105,4	116,5	108,0	116,8	98,0	116,3
1943	106,2	116,8	110,9	117,0	109,2	115,7
1944	106,5	117,4	110,6	118,1	99,6	116,9
1945	106,4	117,1	113,0	116,8	98,5	117,6
1946	106,7	116,7	109,7	117,1	101,0	117,1
1947	105,3	117,1	110,2	117,8	107,3	115,7
1948	105,3	116,7	111,8	116,7	101,1	116,3
1949	107,6	117,4	109,8	118,0	99,7	117,1
1950	109,5	116,5	108,5	117,2	106,5	116,7
1951	109,0	116,3	111,8	116,5	109,9	115,4
1952	105,8	117,3	114,2	117,5	104,8	117,0
1953	104,5	117,5	110,8	117,7	97,9	116,9
1954	108,8	116,7	112,5	117,0	103,3	116,7
1955	108,1	116,8	109,5	117,7	102,3	116,7
1956	109,2	116,3	109,3	117,2	109,7	115,3
1957	107,9	116,0	111,0	116,5	108,5	115,7
1958	104,8	116,3	108,5	116,8	100,3	115,5
1959	108,4	116,2	112,7	116,0	105,0	116,2
1960	106,7	116,7	111,7	116,7	101,8	116,5

D.: Dutch Harbor
H.: Honolulu

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