

WEATHER TYPES AND ATMOSPHERIC PRESSURE IN THESSALONIKI - GREECE

by

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Abstract: *Daily (24 hours) mean values of atmospheric pressure in Thessaloniki between the years 1931-1939 and 1947-1970 are studied in combination with weather types prevailing in the area of Greece.*

Remarkable frequency is observed for low pressure weather types in winter with maximum frequency between 758.0-760.0 mmHg, while high pressure or complex systems are more frequent in the summer with maximum frequencies between 762.0-764.0 mmHg and 758.0-762.0 mmHg respectively.

INTRODUCTION

In the present work daily (24 hours) mean values of atmospheric pressure in Thessaloniki are studied in connection with the pressure pattern (M.S.L.) prevailing in the area of Greece.

The subject of atmospheric pressure in Thessaloniki has been examined in the past by a number of scientists, i.e. EREDIA ⁷, KUHLEBRODT ^{8,9} and the greeks MARIOLOPOULOS¹³, KYRIAZOPOULOS¹⁰ and ALEXANDROU^{1,2}, in studies of the climate of Thessaloniki.

All these scientists based their studies on data of atmospheric pressure from various meteorological stations that have been operating at various times between the years 1891-1937 in the city of Thessaloniki.

Finally in a previous paper (LIVADAS-MAKROYANNIS¹²) we studied the same subject, from the viewpoint of mean and extreme annual, monthly, and daily values based on observational data from the Meteorological Station of the Institute of Meteorology and Climatology of the University, for the period between the years 1930-1939 and 1947-1970.

On these same daily mean values the work in hand is also based.

On the other hand the study of pressure patterns at M.S.L. affecting the area of Greece has been the subject of many a study in the past.

We follow here the classification introduced by LIVADAS¹¹.

TABLE I
Total Number of each Type's Occurrence during the 1931 - 1939 and 1951 - 1971 (30 years).

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII	Total
J	240	136	34	34	4	125	106	52	41	5	61	39	47	930
F	232	100	19	39	4	106	116	45	42	22	37	40	45	847
M	262	89	27	51	9	105	99	50	75	26	43	44	50	930
A	170	66	6	75	24	112	129	48	96	11	43	55	65	900
M	225	73	10	90	45	61	137	49	120	8	22	56	34	930
J	258	115	6	68	51	25	82	44	143	4	25	73	6	900
J	368	155	5	29	41	13	30	38	135	1	28	87	0	930
A	393	137	6	22	34	13	37	47	129	0	34	74	4	930
S	365	144	8	20	17	41	66	25	110	2	54	25	23	900
O	302	136	21	38	14	79	97	30	62	4	60	15	72	930
N	214	108	23	40	9	116	117	46	50	11	47	27	92	900
D	212	140	24	22	5	137	117	48	39	19	62	23	82	930
Total	3,241	1,399	189	528	257	933	1,133	522	1,048	113	516	558	520	10,957

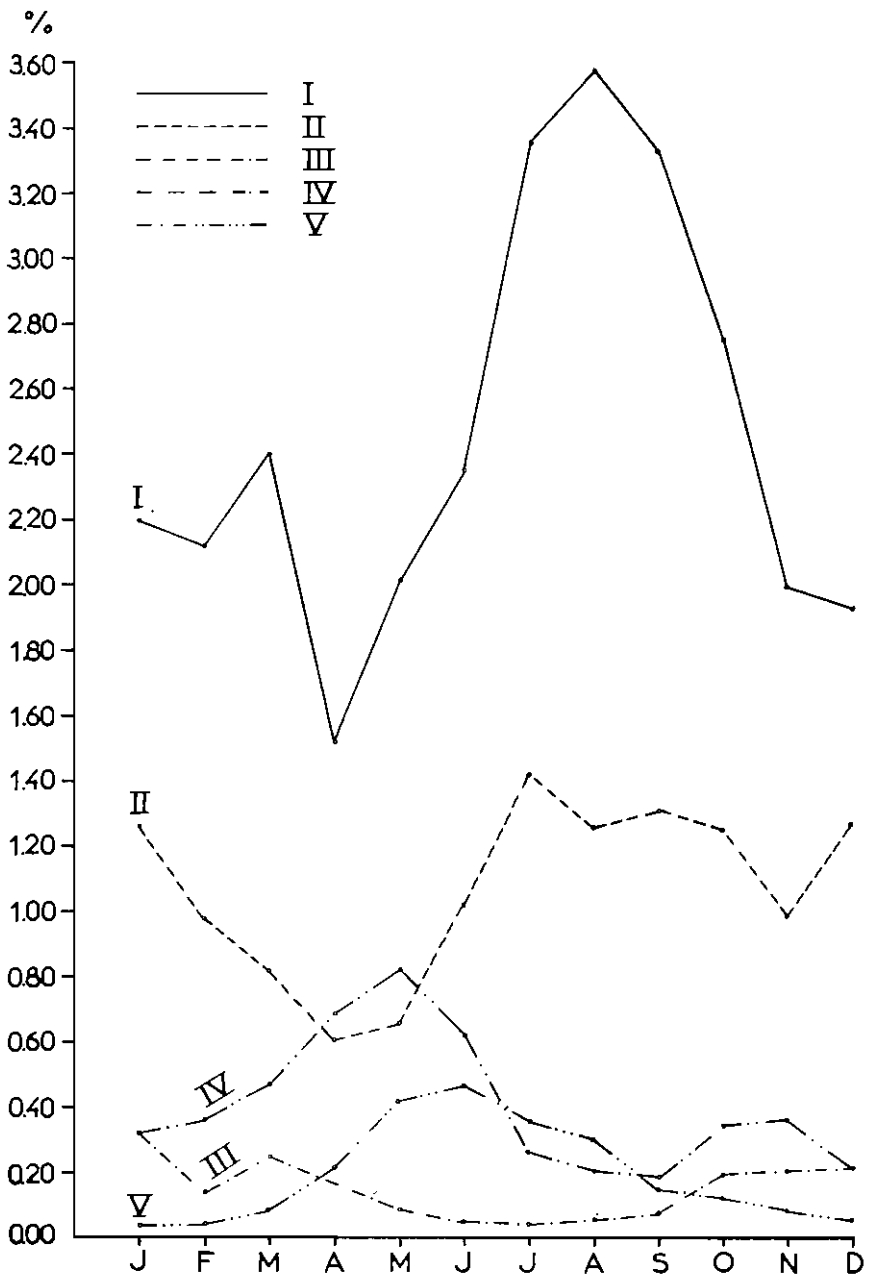
TABLE II

Percentage of various weather types per month, calculated:

a) from the total number of each weather type.

b) from the total number of all weather types.

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J	7.48	9.72	18.47	6.43	1.55	13.39	9.35	9.96	4.48	4.42	11.82	6.98	9.03
b	2.19	1.24	0.31	0.31	0.03	1.14	0.96	0.47	0.42	0.04	0.55	0.35	0.42
F	7.15	7.14	10.32	7.38	1.55	1.36	10.23	8.62	4.00	19.46	7.17	7.16	8.65
a	2.41	0.91	0.17	0.35	0.03	0.96	1.05	0.41	0.38	0.20	0.33	0.36	0.41
M	8.08	6.36	14.67	9.65	3.50	11.25	8.73	9.57	7.15	23.00	8.33	7.88	9.61
b	2.39	0.81	0.24	0.46	0.08	0.95	0.90	0.45	0.68	0.23	0.39	0.40	0.45
A	5.24	4.71	3.26	14.20	9.33	12.00	11.38	9.19	9.16	9.73	8.33	9.85	12.50
a	1.55	0.60	0.55	0.68	0.21	1.02	1.17	0.43	0.87	0.10	0.39	0.50	0.59
M	6.94	5.21	5.43	17.04	17.50	6.53	12.09	9.38	11.45	7.07	4.26	10.03	6.53
b	2.05	0.66	0.09	0.82	0.41	0.55	1.25	0.44	1.09	0.07	0.20	0.51	0.31
J	7.96	8.22	3.26	12.87	19.84	2.67	7.23	8.42	13.64	3.53	4.84	13.08	1.15
a	2.35	1.04	0.05	0.62	0.46	0.22	0.74	0.40	1.30	0.03	0.22	0.66	0.05
b	11.35	11.07	2.71	5.49	15.95	1.39	2.64	7.27	12.88	0.88	5.42	15.59	—
J	3.35	1.41	0.04	0.26	0.37	0.11	0.27	0.34	1.23	0.00	0.25	0.79	—
a	12.12	9.79	3.26	4.16	13.22	1.39	3.26	9.00	12.30	—	6.58	13.26	0.76
A	3.58	1.25	0.05	0.20	0.31	0.11	0.33	0.42	1.17	—	0.31	0.67	0.03
b	11.26	10.29	4.34	3.78	6.61	4.39	5.82	4.78	10.49	1.76	10.46	4.48	4.42
S	3.33	1.31	0.07	0.18	0.15	0.37	0.60	0.22	1.00	0.01	0.49	0.22	0.20
a	9.31	9.72	11.41	7.19	5.44	8.46	8.56	5.74	5.91	3.53	11.62	2.68	13.84
b	2.75	1.24	0.19	0.34	0.12	0.72	0.88	0.27	0.56	0.03	0.54	0.13	0.65
O	6.60	7.71	12.50	7.57	3.50	12.43	10.32	8.81	4.77	9.73	9.10	4.83	17.69
a	1.95	0.98	0.20	0.36	0.08	1.05	1.06	0.41	0.45	0.10	0.42	0.24	0.83
b	6.54	10.00	13.04	4.16	1.94	14.68	10.32	9.19	3.72	16.81	12.01	4.12	15.76
D	1.93	1.27	0.21	0.20	0.04	1.25	1.06	0.43	0.35	0.17	0.56	0.20	0.74

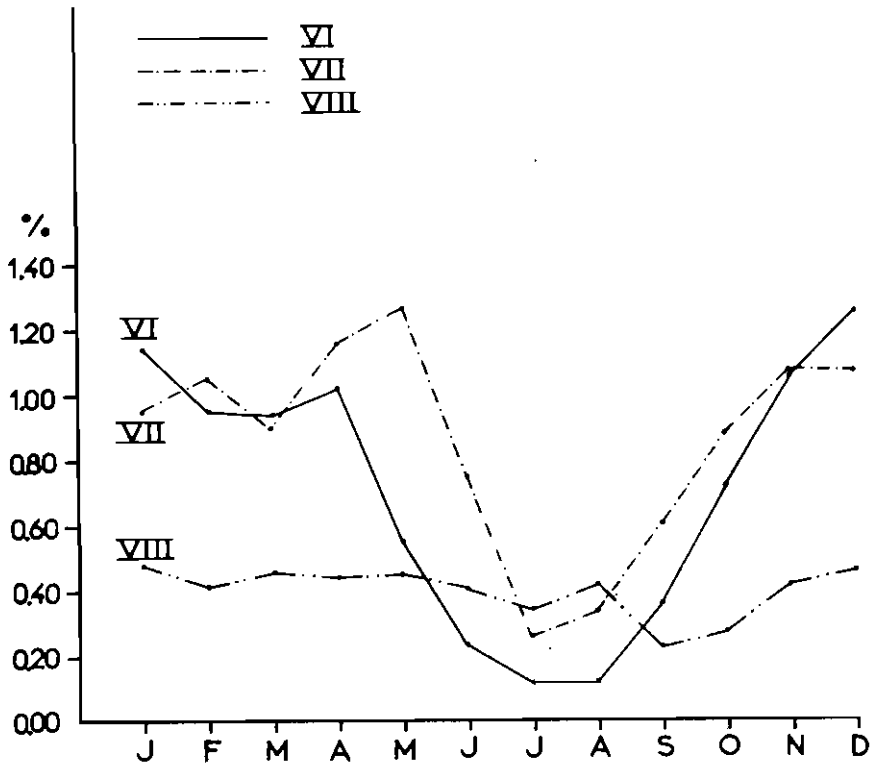


ΓΡΑΦΗ Ι

WEATHER TYPES

Since, as it is known, each pressure pattern is followed by a certain type of weather, the above mentioned scientist¹¹, has classified them as «weather types».

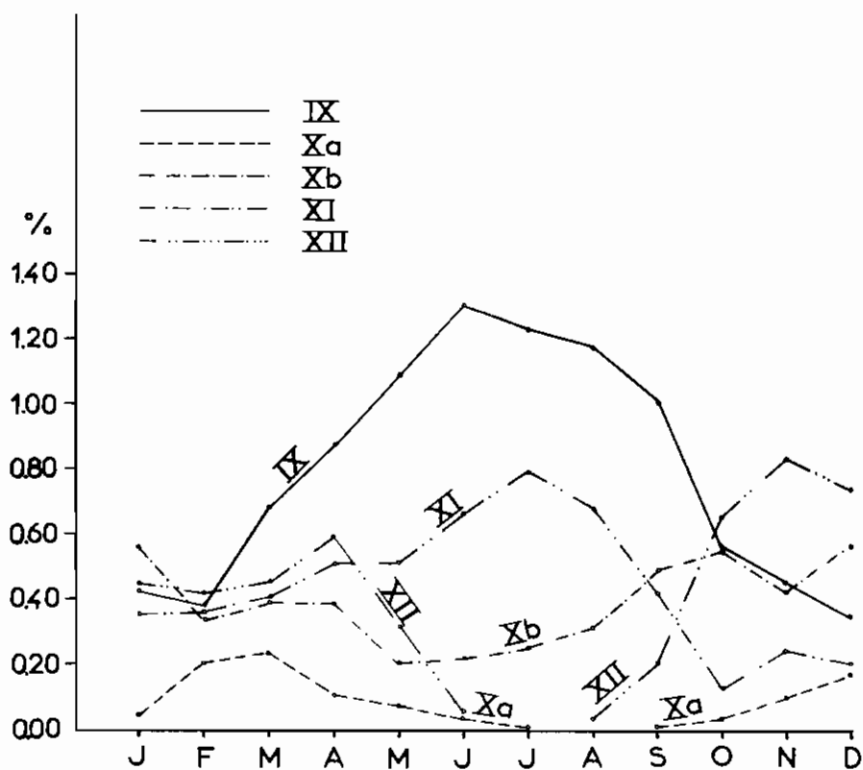
From *Tables I and II*, and *Graphs I, II and III*, we find that:



GRAPH II

Weather Types (I) and (II) are among those characterized by a high pressure pattern (I, II, III, IV, V), the ones with remarkable frequency throughout the whole year. This frequency increases during the summer months.

On the other hand weather types (VI, VII, VIII), characterized by low pressure systems have an increased frequency during the winter months, which is rather remarkable for W.T. (VI) and (VII).



GRAPH III

Among such Weather Types as are produced by the combined effect of two or more pressure systems (W.T. IX, Xa, Xb, XI, XII), those with appreciable frequency are (IX), (XI), and (Xb) in that order; their frequency too seems to be increased during the summer months.

Atmospheric pressure and weather types:

Daily values of atmospheric pressure are examined herein, in connection with the prevailing in the area of Greece weather types.

Initially we have assembled these values in 13 groups, each group including all the values that have been recorded with the same weather type.

Mean and extreme daily values of atmospheric pressure in con-

nection with the prevailing weather type, for each month, are given in *Table III*.

From *Tables III, IV, V, and VI*, and *Graphs IV, V, VI* we draw the following conclusions:

High Pressure Systems: When such system prevail in the area of Greece atmospheric pressure values are generally high. They are due to transitory highs, from the North of Atlantic or Polar origin (W.T. (I) and (II)), or to ridges from highs of Asiatic origin (W.T. (III)) or to transitory highs from the West or South, whose centers have trajectories above the Mediterranean (W.T. (VI) or along the North African coast (W.T. (IV)) (*LIVADAS*¹¹).

Mean values are as a rule higher during the cold semester from October to March, that is values recorded stand between: 765.92 - 768.13 mm Hg (W.T. (I)) 766.50 - 768.72 mm Hg (W.T. (II))/763.93 - 766.18 mm Hg (W.T. (III)), 761.75 - 764.84 mm Hg (W.T. (IV)) and 764.65 - 766.73 mm Hg (W.T. (V)).

Values recorded during the remaining months are rather smaller having as follows: 760.51 - 764.05 mm Hg (W.T. (I)) / 760.75 - 764.00 mm Hg (W.T. (II)) / 758.97 - 762.08 mm Hg (W.T. (III))/758.72 - 760.93 mm Hg (W.T. (IV)) / 760.31 - 763.35 mm Hg (W.T. (V)).

The same applies for their standard deviation (S.D.).

As to the frequency distribution of the above daily mean values for each weather type with a *remarkable* frequency (*Tables I, II*), from *Tables IV, V, VI* and *Graphs IV, V, VI* we draw the following conclusions:

WEATHER TYPE I.

Out of 3241 cases of W.T. (I) examined herein, a percentage of 65.20 % of daily pressure values stand between: 760.0 - 768.0 mm Hg (maximum frequency values between 762.0 - 764.0 mm Hg).

Another percentage of 19.52 % of these daily values are above 768.0 mm Hg, while a 15.22 % are below 760.0 mm Hg (*Table IV - Graph IV*).

WEATHER TYPE II.

Out of 1399 cases examined, a percentage of 64.46 % recorded daily pressure values between: 760.0 - 768.0 (maximum frequency

TABLE III

Mean and extreme daily values of Atmospheric Pressure in Thessaloniki (M.S.L.) with the corresponding (S.D.) in connection with the weather type prevailing in the area of Greece for each month during the 1931 - 1939 and 1951 - 1971 period. (30 years).

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J	max	779.27	779.40	773.84	770.86	770.20	767.01	764.81	767.30	765.40	776.95	774.51	771.34
	mean	767.56	767.93	766.18	764.84	766.38	758.01	756.72	756.39	761.08	764.15	762.34	762.49
	min	753.26	750.10	759.29	756.58	762.10	745.62	740.24	744.18	753.85	753.52	753.32	752.44
	S.D.	±4.83	±4.64	±3.59	±3.30	±3.04	±4.57	±4.44	±5.10	±3.96	±4.86	±4.57	±4.22
F	max	777.76	78.83	72.08	70.85	70.38	69.42	71.76	65.10	66.28	73.84	69.12	74.78
	mean	66.04	66.89	63.98	63.29	66.73	57.82	56.71	56.72	61.66	63.10	61.00	60.54
	min	51.26	57.77	56.92	55.82	65.09	39.75	45.30	49.80	52.94	55.62	52.61	41.76
	S.D.	5.52	5.06	4.67	4.72	2.16	5.09	4.75	3.84	3.82	4.23	4.18	5.73
M	max	75.88	75.71	70.70	68.20	69.83	67.84	68.17	67.01	67.66	71.92	66.61	65.28
	mean	65.92	66.91	64.83	62.45	66.00	57.76	55.92	56.41	61.39	61.40	61.44	60.62
	min	54.82	55.85	58.81	55.75	63.34	45.84	42.79	42.77	55.17	52.46	55.72	54.75
	S.D.	4.27	4.16	3.28	2.99	2.33	4.37	4.73	4.37	3.15	3.45	2.98	2.67
A	max	71.43	70.82	62.90	68.07	69.68	67.39	64.02	62.60	68.72	69.32	68.22	66.33
	mean	63.86	63.92	61.07	60.93	63.55	58.17	57.12	56.38	61.44	61.90	60.36	59.90
	min	55.08	52.21	59.52	53.64	55.61	47.90	44.22	49.57	53.87	55.52	52.68	53.47
	S.D.	2.94	3.22	1.00	2.85	3.50	4.12	3.43	3.04	3.09	2.76	3.30	3.20
M	max	71.97	66.98	64.24	66.09	67.22	65.00	63.54	65.59	65.20	65.83	64.20	66.35
	mean	62.71	62.71	62.07	60.58	62.07	58.25	57.53	58.33	59.96	61.55	59.07	59.37
	min	54.83	55.62	58.07	55.63	54.99	50.67	50.26	53.24	52.84	54.06	53.97	52.41
	S.D.	2.71	2.32	1.67	2.38	2.81	3.08	2.61	2.60	2.31	3.20	2.56	2.91
J	max	67.66	68.97	65.07	63.17	65.88	66.86	62.52	65.97	66.92	65.86	63.44	61.42
	mean	61.64	62.71	62.08	59.17	61.35	59.38	57.48	57.47	59.93	56.54	58.68	58.85
	min	54.96	56.60	58.94	54.68	55.01	48.45	52.19	50.36	54.82	56.47	54.25	55.95

J	S.D.	2.36	2.40	1.92	1.94	2.49	3.46	2.21	2.78	2.09	2.87	2.76	2.16	1.90
	max	67.10	66.99	59.89	62.17	63.55	64.19	63.09	61.85	63.07	—	64.40	62.45	—
	mean	60.51	60.75	58.97	58.92	60.31	58.69	56.12	57.03	58.49	—	59.28	58.27	—
	min	53.30	54.09	57.41	53.70	55.52	53.47	52.68	52.83	52.03	—	52.60	52.41	—
	S.D.	2.27	2.36	0.91	1.81	1.69	3.23	2.41	2.04	2.27	—	2.75	2.35	—
A	max	66.91	65.53	62.65	61.94	63.65	61.45	60.66	62.35	63.32	—	63.76	64.04	58.01
	mean	60.98	61.25	59.88	58.72	60.37	57.42	56.47	56.91	58.40	—	59.40	58.65	57.18
	min	53.24	54.91	55.80	55.66	56.61	52.93	51.24	52.16	52.82	—	53.78	52.81	56.49
	S.D.	2.28	2.01	2.41	1.63	1.56	2.09	2.09	2.32	2.08	—	2.25	2.21	0.56
S	max	73.02	72.85	64.30	62.78	64.42	64.57	64.14	65.81	65.37	—	68.22	65.02	68.38
	mean	64.05	64.00	60.89	60.25	61.54	59.14	58.49	59.57	61.04	—	62.36	60.62	60.85
	min	53.95	57.41	57.22	57.25	59.97	51.00	51.76	53.01	56.74	—	57.41	55.95	55.36
	S.D.	2.93	2.98	2.44	1.67	1.34	2.99	2.64	3.28	1.94	—	2.71	2.40	2.93
O	max	73.11	72.25	66.34	66.05	67.15	69.92	68.38	67.10	66.52	70.23	71.69	64.98	70.29
	mean	66.41	66.51	63.93	62.05	63.29	60.78	60.93	60.02	62.18	60.62	64.53	61.01	61.25
	min	59.58	55.59	60.60	57.05	58.23	53.35	51.00	55.25	56.40	55.45	50.61	53.92	52.89
	S.D.	2.70	2.91	1.41	2.14	2.66	3.40	2.85	3.01	2.08	5.73	4.38	3.40	3.49
N	max	80.15	80.12	73.58	69.15	68.42	72.00	68.85	66.50	70.27	66.18	73.29	66.78	70.80
	mean	68.13	67.78	65.96	63.54	65.11	61.03	60.18	59.32	64.04	62.47	64.59	62.51	62.37
	min	59.21	56.05	60.35	58.79	51.50	49.90	52.55	50.55	56.52	56.57	47.84	56.32	53.40
	S.D.	3.40	3.90	2.80	2.34	4.99	4.22	3.12	3.34	2.73	2.55	4.71	2.70	3.64
D	max	79.23	77.35	72.67	69.13	71.90	72.08	73.55	68.28	73.00	68.93	—	69.08	70.25
	mean	68.10	68.72	65.54	61.71	64.65	58.93	56.60	57.19	62.98	61.64	—	61.23	62.24
	min	52.52	54.65	54.34	55.43	59.67	44.16	47.05	45.45	54.40	52.37	—	53.34	51.19
	S.D.	4.93	4.26	4.47	4.20	4.03	4.86	4.60	4.47	3.84	5.08	—	4.34	4.03

TABLE IV
Distribution of frequency of daily values of Atmospheric Pressure in Thessaloniki Greece for Weather - Types (I)(a), (II)(b).

	J	F	M	A	M	J	J	A	S	O	N	D	S	%
780.5 - 78.0	a	4									3	3	10	0.30
	b	3	2								2	6	7	0.50
780.0 - 76.0	a	6	7								3	2	19	0.59
	b	6	3								3	14	14	1.00
76.0 - 74.0	a	3	8	4							7	9	36	1.11
	b	4	6	5							4	28	28	2.00
74.0 - 72.0	a	28	15	16					1	7	16	24	107	3.30
	b	12	8	5					1	1	2	22	51	3.64
72.0 - 70.0	a	31	20	33	2				8	23	33	29	183	5.64
	b	16	6	9	1				5	15	12	30	94	6.71
70.0 - 68.0	a	47	30	33	11	2			21	53	45	36	278	8.58
	b	23	15	17	5	1			9	31	22	24	147	10.50
68.0 - 66.0	a	33	35	44	29	9	3	8	62	83	53	32	408	12.59
	b	26	14	17	8	5	2		18	30	27	13	171	12.22
66.0 - 64.0	a	27	39	43	43	5	19	29	90	76	34	21	503	15.51
	b	23	16	19	21	17	10	12	36	34	24	20	254	18.15
64.0 - 62.0	a	35	25	42	40	60	67	91	97	47	15	24	619	19.09
	b	10	14	6	18	24	36	42	34	18	5	8	257	18.37
62.0 - 60.0	a	12	27	26	32	61	73	127	58	12	7	10	584	18.01
	b	9	7	7	8	18	30	45	33	3	6	9	220	15.72
60.0 - 58.0	a	7	11	13	7	23	51	100	20	1	1	9	330	10.18
	b	2	7	1	1	12	35	32	6	3	1	1	107	7.64
58.0 - 56.0	a	4	9	2	3	7	12	32	5			2	124	3.82
	b	1	2	2	2	1	3	5	2		1	1	36	2.57
56.0 - 54.0	a	2	3	6	3	4	3	6	2			1	31	0.95
	b	1	1	1	1	1	5	1	1	1	1	1	11	0.78
54.0 - 52.0	a	1	2				1	2	1			1	8	0.24
	b												1	0.07
52.0 - 50.0	a	1	1										1	0.03
	b												1	0.07
Total	a	240	232	262	170	225	258	368	393	302	214	212	3241	99.94
	b	136	10	89	66	73	115	155	137	136	108	140	1399	99.94

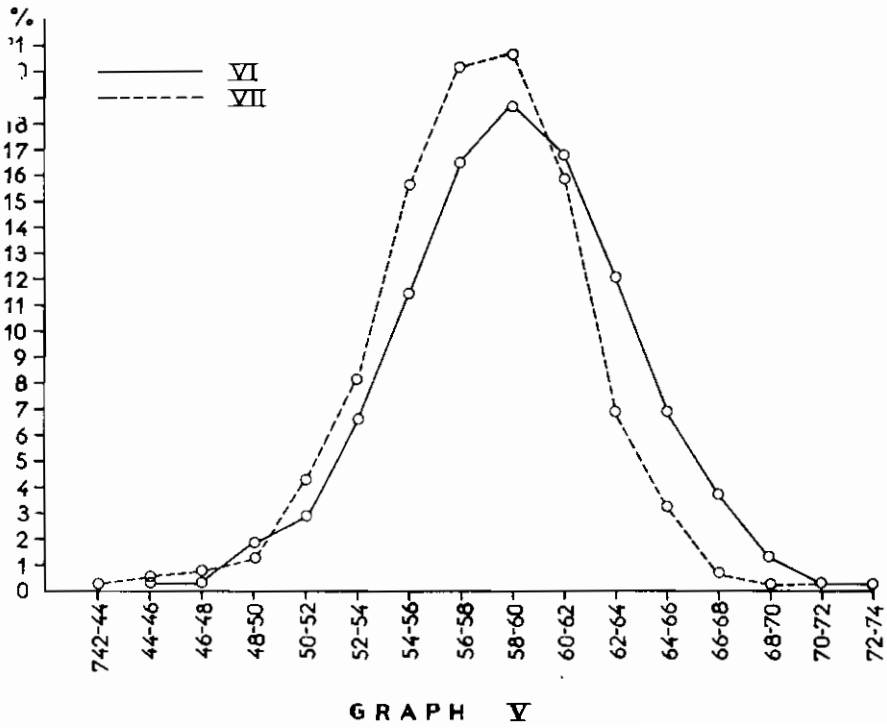
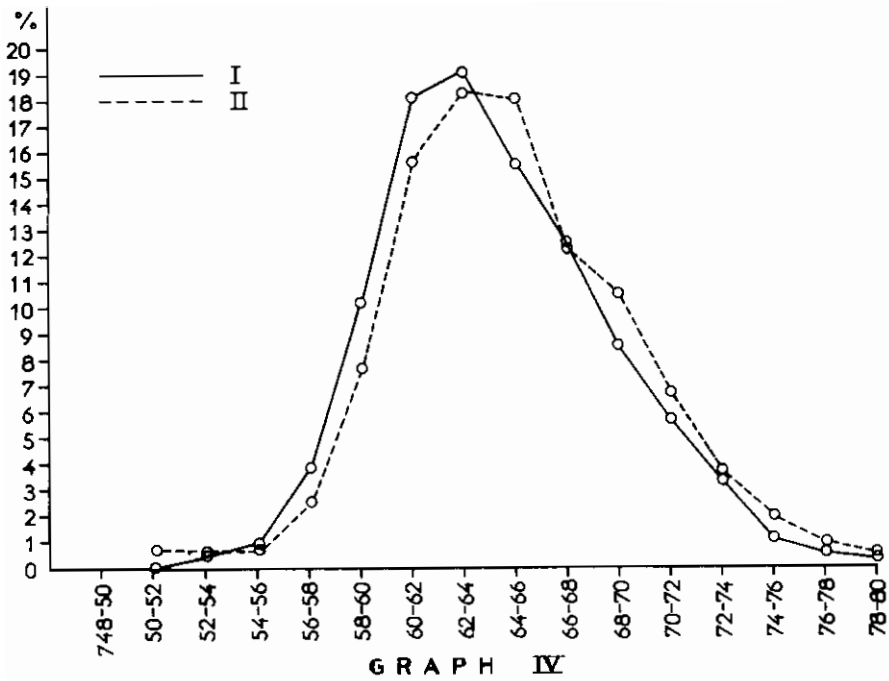
TABLE V
Distribution of frequency of daily values of Atmospheric Pressure in Thessaloniki Greece for Weather - Types VI(a), VII(b).

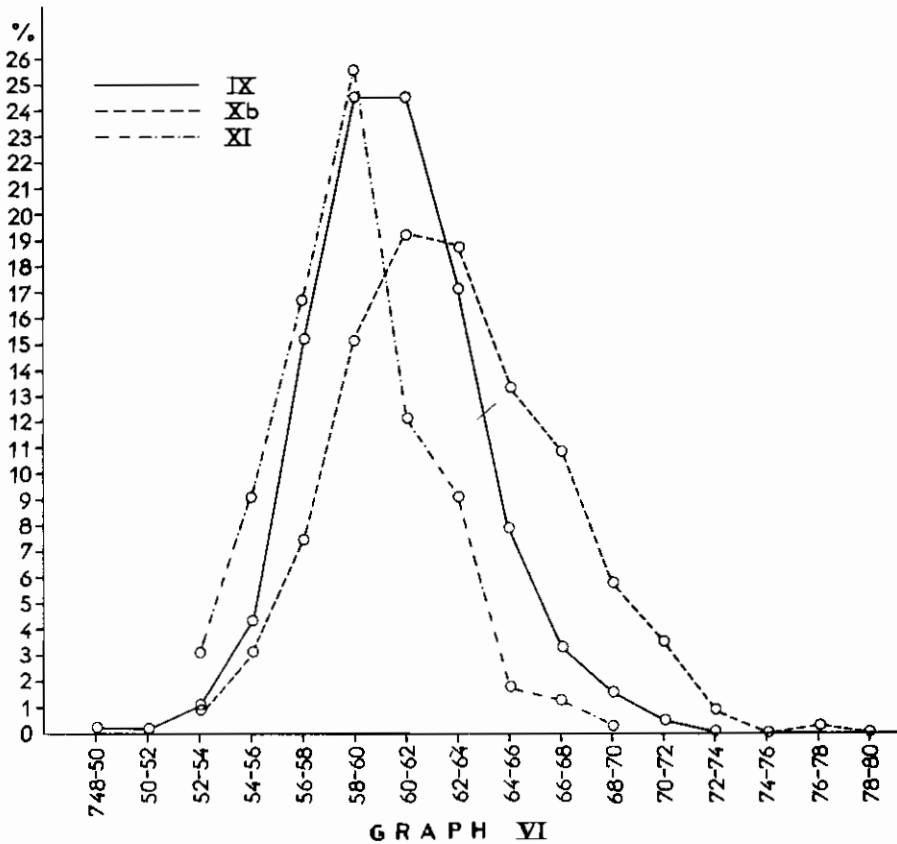
	J	F	M	A	M	J	J	A	S	O	N	D	S	%
774.0 - 72.0	a										1	1	2	0.21
	b													
72.0 - 70.0	a	1									1	1	2	0.17
	b	3										4	13	1.39
70.0 - 68.0	a		1							1	3	4	3	0.26
	b	3	3							2	8	7	35	3.75
68.0 - 66.0	a	1	1							2	2	3	8	0.70
	b	5	3							2	2	3	8	0.70
66.0 - 64.0	a	13	2	1						12	12	13	64	6.85
	b	4	5	1						12	8	5	37	3.26
64.0 - 62.0	a	12	9	11	4					15	24	9	113	12.11
	b	6	8	6	4	1				15	20	6	78	6.88
62.0 - 60.0	a	24	14	15	26	10	1			15	23	15	156	16.72
	b	14	15	12	19	26	10	1		28	32	13	181	15.97
60.0 - 58.0	a	16	23	19	18	14	11	4		12	15	27	174	18.64
	b	19	16	15	35	30	19	5		24	22	15	235	20.74
58.0 - 56.0	a	23	13	22	9	16	3	2		16	17	22	154	16.50
	b	20	13	20	24	37	34	8		13	18	21	229	20.21
56.0 - 54.0	a	11	13	12	20	8	2	2		5	5	23	107	11.46
	b	15	23	14	21	30	13	9		11	11	19	177	15.62
54.0 - 52.0	a	10	12	11	12	2	1	1		1	4	8	62	6.64
	b	16	17	14	17	6	4	3		1	2	16	104	9.17
52.0 - 50.0	a	6	7	4	6	1					2	2	27	2.89
	b	8	8	8	4	4		1		1	2	13	48	4.23
50.0 - 48.0	a	3	3	6	1						1	3	18	1.92
	b	2	6	2	2							2	14	1.23
48.0 - 46.0	a	1	1	1	1							1	3	0.32
	b	1	1	1	1							3	9	0.79
46.0 - 44.0	a	1	1	1								1	3	0.32
	b	2	2	2	1							1	5	0.44
44.0 - 42.0	a	1												
	b	2											3	0.26
Total	a	125	106	105	112	61	25	13	41	79	116	137	933	99.99
	b	106	116	99	129	137	82	30	66	97	117	117	1133	99.99

TABLE VI
Distribution of frequency of daily values of Atmospheric Pressure in Thessaloniki Greece for Weather - Types IX(a), Xb(b), XI(c).

	J	F	M	A	M	J	J	A	S	O	N	D	S	%
778.0 - 76.0	1											1	2	0.38
a														
b														
c														
76.0 - 74.0														
a														
b														
c														
74.0 - 72.0	2	1									1	1	5	0.96
a														
b														
c														
72.0 - 70.0	1	1	1							7	1	2	4	0.47
a														
b														
c														
70.0 - 68.0	6	5	4						1	7	2	2	6	1.52
a														
b														
c														
68.0 - 66.0	4	3	7	1		2			7	2	7	2	3	3.24
a														
b														
c														
66.0 - 64.0	11	8	1	1	2				7	11	4	6	10	10.25
a														
b														
c														
64.0 - 62.0	10	4	11	14	4				6	11	16	7	8	7.91
a														
b														
c														
64.0 - 62.0	8	4	10	4	2	20	12	7	4	5	8	5	5	9.13
a														
b														
c														
64.0 - 62.0	5	8	7	15	7	9	3	1	13	5	7	17	97	17.08
a														
b														
c														
64.0 - 62.0	8	8	8	10	7	3	3	2	2	3	8	6	68	18.79
a														
b														
c														

62.0 - 60.0	a	6	7	16	27	38	50	24	17	39	18	5	10	257	24.52
	b	9	7	12	8	5	4	8	12	14	10	5	5	99	19.18
	c	2	10	10	18	8	17	20	18	8	1	3	1	116	20.78
60.0 - 58.0	a	9	3	14	20	37	44	42	51	25	8	1	3	257	24.52
	b	8	4	7	6	3	4	8	13	10	5	4	6	78	15.11
	c	5	5	8	8	20	23	25	28	9	2	5	4	143	25.62
58.0 - 56.0	a	2	5	11	12	16	23	36	38	9	1	3	3	159	15.17
	b	3	3	4	5	4	5	4	4	2	2	3	4	39	7.55
	c	2	2	6	6	10	21	25	15	1	3	1	1	93	16.66
56.0 - 54.0	a	1	1	3		3	4	18	14					45	4.29
	b	2	1	1		3		3	3		1			16	3.10
	c	5	3	1	4	8	9	11	7	1			2	51	9.13
54.0 - 52.0	a	1	2		1	2		3	2					11	1.04
	b	1	1	1	1	1		1	1				1	5	0.96
	c	1	4	1	2	1		3	3		1	2	2	17	3.04
52.0 - 50.0	a		1											1	0.09
	b													1	0.14
	c		1											1	—
50.0 - 48.0	a											1		1	0.09
	b													1	0.19
Total	a	47	42	75	96	120	143	135	129	110	62	50	39	1048	99.94
	b	61	37	43	43	22	25	28	34	54	60	47	62	516	99.92
	c	39	40	44	55	56	73	87	74	25	15	27	23	558	99.93





values: 762.0 - 764.0 mm Hg). Another 24.35 % are above 768.0 mm Hg, and 11.13 % are below 760.0 mm Hg.

LOW PRESSURE SYSTEMS.

The area of Greece is under the effect of low pressure. The center of one or more depressions are either above the Central Mediterranean and the Jonian Sea (W.T. VI), or over the Aegean and the Jonian Sea (W.T. VII), or over Northern Balkans (W.T. VIII) (LIVADAS¹¹).

Mean values (Table II) show throughout the year a good enough concentration between: 754.42 (Aug.) - 761.03 mm Hg (Nov.) (W.T. (VI)) / 755.71 (March) - 760.93 mm Hg (Oct.) (W.T. VII) / 756.31 (April) - 760.02 mm Hg (Oct.) (W.T. (VIII)).

Their standard deviations seem to increase during the cold five months, from November to March.

The frequency distribution of daily pressure values (Table V) for Weather Types VI and VII, that have a notable frequency, indicates that:

WEATHER TYPE VI.

Out of 933 cases examined, a percentage of 75.43 % recorded values between 754.0 - 764.0 mm Hg (maximum frequency values between 758.0 - 760.0 mm Hg). Another percentage of 12.41 % are above 764.0 mm Hg, and 12.09 % are below 752.0 mm Hg (Table V - Graph V).

WEATHER TYPE VII.

Out of 1133 cases examined, a percentage of 72.54 % of daily values stand between 754.0 - 762.0 mm Hg (maximum frequency values between 758.0 - 760.0 mm Hg). Another percentage of 11.27 % are above 762.0 mm Hg, and 16.12 % are below 754.0 mm Hg.

From the above distribution of daily pressure values between the two characteristic low pressure Weather Types (VI, VII) one could support that:

The area of Thessaloniki seldom feels the effect of low pressure centers, at least not of deep ones. Usually it stands at the northern end of their trajectories which usually pass over the Jonian — the Aegean Sea — The Propontis (Sea of Marmara) the Black Sea; this applies even more in cases of lows whose trajectories pass over the Jonian — the Central Aegean — Cyprus — the Middle East (LIVADAS - ΜΑΚΡΟΥΑΝΝΙΣ¹²).

COMPLEX PRESSURE SYSTEMS.

The area of Greece is under the combined effect of two or more pressure systems, all of which lend their particular characters to the prevailing weather pattern.

These pressure systems may have as follows:

- a) A col. (W.T. IX).
- b) A depression to the north and a high to the south of the Greek area (W.T. Xa).
- c) A high to the north and a low to the south of the Greek area (W.T. Xb).

b) A high to the West and a depression to the east of Greece (W.T. XI).

e) A high to the east and a low to the west of Greece. (W.T. (XII)) (LIVADAS¹¹).

From *Table III* we find that:

Mean pressure values for the above weather types are higher than those of purely low pressure systems, but yet smaller than those of high pressure systems, since they stand between 758.40 (Aug.) — 763.09 mm Hg (Jan) (W.T. IX) / 756.30 (June) — 762.47 mm Hg (Nov.) (W.T. (Xa)) / 759.10 (Aug.) - 764.59 mm Hg (Nov.) (W.T. (Xb)) / 758.27 (July) - 762.51 mm Hg (Nov.) (W.T. (XI)) / 757.18 (Aug.) - 762.49 mm Hg (Jan.) (W.T. (XII)).

It should be noted that Weather Types Xa, XII, never occur on certain summer months, while for the remaining months we observe from *Table VI* and *Graph VI* the following:

WEATHER TYPE IX.

Out of 1048 cases examined a percentage of 81.29 % of daily values vary between 756.0 - 764.0 mm Hg (maximum frequency values between) 758.0 - 762.0 mm Hg). Another 13.14 % of daily values are above 764.0 mm Hg and 5.51 % are below 756.0 mm Hg.

WEATHER TYPE Xb.

Out of 516 cases examined, a percentage of 84.87 % of daily values stand between 756.0 - 768.0 mm Hg (maximum frequency values between 760.0 - 762.0 mm Hg). Another 10.63 % are above 768.0 mm Hg and 4.44 % are below 756.0 mm Hg.

WEATHER TYPE XI.

Graph VI shows characteristically the remarkable gathering of values between 756.0 - 762.0 mm Hg, representing 63.06 % of the 558 cases examined.

Table VII and *Histogram I* indicate again values of atmospheric pressure recorded in Thessaloniki, per month when high or low pressure systems or complex systems prevailed in the Greek area, thus rendering comparisons possible.

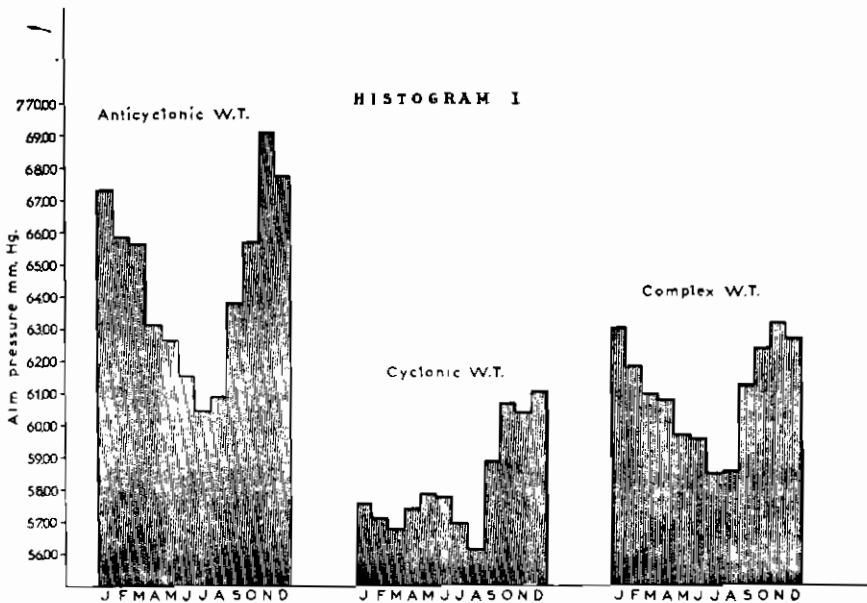
These daily mean values have been calculated from the sums of values of every weather type included in each of the above three categories separately.

TABLE VII

Mean daily values of Atmospheric Pressure (M.S.L.) in Thessaloniki per month and per Weather - Type: Anticyclonic (a), Cyclonic (b) and Complex (c) corresponding.

	anticyclonic W.T. (a)	cyclonic W.T. (b)	Complex W.T. (c)
J	767.35	757.58	763.07
F	65.89	57.15	61.86
M	65.65	56.78	60.99
A	63.16	57.40	60.84
M	62.65	57.87	59.69
J	61.53	57.79	59.59
J	60.47	56.96	58.50
A	60.91	56.14	58.56
S	63.78	58.89	61.29
O	65.73	60.69	62.42
N	69.13	60.39	63.22
D	67.77	61.06	62.72

It is proved again here, as it should be expected, that pressure values of complex pressure systems stand between those of high and low pressure systems.



It is also clearly seen (Histogram I) that the highest values have been recorded during the cold four months, from October to January.

CONCLUSIONS.

From all the above, we draw the following conclusions:

a. The area of Greece throughout the year is mainly affected (with a remarkable frequency during the period examined) by the following weather types: (I) and (II) for High, and (VI) and (VII) for Low pressure Systems, and also (IX), (XI), (Xb) for Complex Pressure Systems at M.S.L.

These frequency of low pressure systems is increased during the winter season, while that of the other two categories appears increased during the summer season.

b. The daily mean pressure values for the above area have as follows:

1. High pressure systems: Between 758.72 - 768.72 mm Hg, with maximum frequency values between 762.0 - 764.0 mm Hg with W.T. (I) and (II).

2. Low pressure systems: Between 754.42 - 761.03 mm Hg with maximum frequency values between 758.0 - 760.0 mm Hg, for W.T. VI and VII.

3. Complex Systems: Between 756.30 - 764.59 mm Hg and maximum frequency values between 758.0 - 762.0 mm Hg, for W.T. IX, Xb, XI.

c) It can be maintained that this region of Greece (Table V) is seldom visited by deep depressions.

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ΠΕΡΙΛΗΨΙΣ

ΤΥΠΟΙ ΚΑΙΡΟΥ ΚΑΙ ΑΤΜΟΣΦΑΙΡΙΚΗ ΠΙΕΣΙΣ ΕΙΣ ΤΗΝ ΘΕΣΣΑΛΟΝΙΚΗΝ

Ἰπὸ

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Εἰς τὴν παροῦσαν ἐργασίαν μελετῶνται αἱ ἡμερήσιαι τιμαὶ (24ώρου) τῆς ἀτμοσφαιρικῆς πίεσεως εἰς τὴν Θεσσαλονίκην, κατὰ τὴν περίοδον 1931 - 1939 καὶ 1947 - 1970, ἐν συνδυασμῶ μετὰ τοῦ ἐπικρατοῦντος ἐκάστοτε τύπου καιροῦ εἰς τὴν ἑλληνικὴν περιοχὴν.

Ὡς προκύπτει αἱ τιμαὶ αὗται εἶναι:

— Μεταξὺ 758.72 - 768.72 mm Hg - τιμαὶ μεγίστης συχνότητος μεταξὺ 762.0 - 764.0 mm Hg - διὰ τοὺς Ἀντικυκλωνικοὺς Τύπους Καιροῦ.

— Μεταξὺ 754.42 - 761.03 mm Hg - τιμαὶ μεγίστης συχνότητος μεταξὺ 758.0 - 760.0 mm Hg διὰ τοὺς Ὑφesiακοὺς.

— Μεταξὺ 756.30 - 764.59 mm Hg - τιμαὶ μεγίστης συχνότητος μεταξὺ 758.0 - 762.0 mm Hg διὰ τοὺς Συνθέτους Τύπους Καιροῦ.

Ἐξ ἄλλου μεγαλύτερα συχνότης ἐμφανίσεως παρατηρεῖται διὰ μὲν τοὺς Ὑφesiακοὺς τύπους καιροῦ κατὰ τὸν χειμῶνα, ἐνῶ οἱ Ἀντικυκλωνικοὶ καὶ οἱ Σύνθετοι τύποι εἶναι περισσότερον συχνοὶ κατὰ τὸ θέρος.