Sci. Annals, Fac. Phys. & Mathem., Univ. Thessaloniki, **14**, 49, (1974)

COOLING POWER AND WEATHER TYPES IN THESSALONIKI

By

CHRISTOS J. BALAFOUTIS

(Institute of Meteorology and Climatology, Aristotelian University of Thessaloniki)

(Introduced by Prof. G. C. Livadas)

(Received, 3.4.1974)

Abstract: *Cooling - power in connection with weather - types in the city of Thessaloniki-Greece is examined for the period between 1.1.1957 - 31.12.1970 and for the observational hours 08:30, 13:30, 18:30 local time (G.M.T. + 2 h).*

Weather types are classified, according to Mörikofer, in groups of : Disconfortably cold - Cold - Comfortably cool-Comfortably warm - Discomfortably warm, for the cold as well as for the warm season, and certain conclusions are drawn.

INTRODUCTION

From previous works on cooling - power in Thessaloniki (LIVADAS [8], LIVADAS - BALAFOUTIS [9] BALAFOUTIS - LIVADAS [2]) it has been observed that cooling power values vary considerably from day to day, especially during the cold season. Thence the problem arose, of studying cooling power in relation with the weather - types prevailing at the time. Weather types are classified in three groups totalling thirteen weather types (LIVADAS [7]). The period examined herein includes observations that were held thrice daily (at 08 : 30, 13 : 30 and 18 : 30 hours *), from 1 - 1 - 1957 till 31 - 12 - 1970. The observations that were possible during this time amount to 5.113, while the following observations were actually effected:

08 : 30	4.984	Observations	(97.48 %)
13 : 30	5.045	»	(98.67 %)
18 : 30	4.690	»	(91.73 %)

The number of daily cooling power values corresponding to each weather type, as well as the number of days on which each weather type prevailed, is given in Table I.

* Local Time = G.M.T. + 2 h.

TABLE I

Occurence Frequency of each Weather - Type on Days when Cooling - Power Observations were effected.

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
08:30	1.373	657	93	221	139	412	593	229	500	40	273	235	217
13:30	1.384	663	99	220	139	420	605	234	512	39	282	232	219
18:30	1.276	619	93	205	125	399	551	225	477	37	259	219	205

In *Table II* we give the mothly mean values of cooling power for each weather type, during the period examined.

Computations of standard deviations resulted in considerable deviations ($\Delta > \pm 3\sigma$) in a percentage of 1 %, distributed as follows:

a) 08 : 30 : 58 daily values
b) 13 : 30 : 49 » »
c) 18 : 30 : 42 » »

Such exceptional values were caused by the prevailing strong winds and small temperatures, whose coincidence results in high cooling - power values (Conrad & Pollak [3]) and are recorded mainly on days when one weather type succeeds another, and there is an abrupt change in weather conditions.

Conrad's and Mörikofer's Climatic Classifications. cooling-Power and Weather Types:

In the study of cooling - power values in relation with each weather type, we have compared the climatic classifications of Conrad [3] and Mörikofer [10]. A combination of the data in Table II with Conrad's and Mörikofer's classifications resulted in *Table III*, showing the behavior of every weather type from the climatological point of view.

From Table III, following Mörikofer's classification, we note the following.

A. Observations of 08 : 30 and 18 : 30 hours.

1) 0 - 5 mg cal cm^{-2} sec^{-1} grade: Cooling - power values within this grade occur only with weather - types III and Xa meaning that as a rule during the morning and afternoon hours the climate of Thessaloniki is not *discomfortably warm.*

2) 5 - 10 mg cal. cm^{-2} sec^{-1} grade: Every weather type produces

TABLE II

Monthty Mean Cooling - Power Values per Weather - Type at 08 : 30
(Period: 1.1.1957 - 31.12.1970)

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J	23.82	19.74	15.28	15.23	15.08	17.38	19.10	17.73	15.20	12.31	26.83	31.11	15.25
F	23.03	18.70	15.54	14.69	13.33	17.25	20.50	15.07	14.43	13.16	28.36	24.38	16.98
M	19.45	18.33	13.79	15.22	13.54	17.03	18.37	11.94	13.25	10.94	23.86	22.72	14.56
A	12.73	11.69	16.85	12.07	13.59	12.67	14.31	11.06	11.47	13.68	20.34	18.92	11.51
M	10.12	10.12	9.91	9.73	9.57	9.35	12.22	9.86	9.24	10.70	13.00	16.41	8.97
J	8.26	7.61	7.03	7.03	7.58	8.07	10.15	8.26	7.64	9.05	14.73	12.96	10.64
J	7.59	7.35	4.64	6.54	7.32	5.96	8.40	6.60	6.30	4.87	9.31	9.89	—
A	7.59	6.93	7.41	6.21	6.09	6.33	7.11	6.17	5.80	—	10.58	12.27	5.82
S	9.91	8.51	6.79	8.16	9.86	9.35	11.11	8.07	6.75	—	11.05	13.67	6.41
O	11.19	10.49	8.53	8.77	8.60	11.11	13.60	12.34	11.26	9.09	17.50	15.09	8.83
N	16.25	13.48	10.73	12.14	10.61	12.95	14.33	11.10	11.53	9.82	18.35	19.46	11.79
D	22.56	18.45	12.87	15.19	30.71	15.30	17.88	13.68	15.64	12.62	25.54	25.27	14.88

TABLE II *(Continued)*

Monthly Mean Cooling - Power Values per Weather - Type at 13 : 30
(Period : 1.1.1957 - 31.12.1970)

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J	21.81	17.34	12.75	13.55	16.46	15.94	18.60	15.00	14.11	13.26	25.78	28.40	14.75
F	19.32	14.63	11.82	14.53	12.92	16.06	18.41	13.34	12.34	11.82	25.41	19.56	14.12
M	15.13	14.43	11.82	11.81	10.39	16.48	15.37	10.54	11.13	14.72	18.75	19.45	12.53
A	10.90	9.17	13.43	9.72	11.64	12.43	12.14	9.24	9.15	10.81	16.12	14.44	10.01
M	7.08	7.11	8.55	6.54	6.29	7.32	9.64	6.77	6.56	6.61	12.95	12.29	7.47
J	4.51	4.29	3.02	4.11	4.55	6.28	6.17	4.83	4.32	6.28	8.67	8.24	5.14
J	3.36	3.39	4.61	2.76	3.52	4.37	5.47	2.87	2.51	3.15	3.83	5.17	—
A	3.77	3.27	3.18	2.32	1.40	4.55	3.92	2.60	2.33	—	5.37	6.12	3.45
S	6.87	5.87	4.13	4.98	4.78	8.34	7.27	5.01	4.72	—	7.65	9.59	7.63
O	9.32	9.22	7.28	6.96	7.68	10.18	11.01	6.57	9.23	7.89	14.86	13.71	8.16
N	13.88	11.55	9.52	10.08	9.93	11.12	12.97	11.30	10.44	9.41	16.67	17.44	10.83
D	20.62	16.16	10.82	12.66	34.04	14.17	16.48	12.33	13.83	10.30	23.73	19.14	13.15

TABLE II *(Continued)*

Monthty Mean Cooling - Power Values per Weather - Type at 18 : 30
(Period : 1.1.1957 - 31. 12.1670)

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J	24.16	18.72	15.22	18.76	16.85	17.69	20.48	20.71	18.29	13.79	25.41	29.65	13.92
F	20.85	17.15	13.82	15.79	12.71	19.68	20.66	16.23	14.72	14.48	27.80	23.17	16.01
M	18.00	16.87	13.61	15.42	12.38	16.85	19.32	14.36	13.97	17.27	20.93	21.88	14.28
A	14.42	12.92	11.83	13.71	11.96	13.97	17.21	13.44	12.74	13.74	14.49	16.59	12.27
M	10.03	10.26	9.85	9.64	8.79	10.18	12.50	9.95	9.12	14.93	11.96	13.99	11.18
J	7.85	7.41	7.29	6.58	7.57	9.49	9.59	7.75	7.79	10.95	10.48	10.16	7.71
J	6.16	6.30	3.38	5.86	6.05	6.97	7.73	6.38	5.60	5.66	8.98	7.91	—
A	6.48	6.30	7.01	5.60	5.49	8.37	6.94	5.84	5.69	—	8.84	8.68	9.61
S	9.66	8.76	6.74	8.71	9.03	10.48	10.40	9.42	7.54	—	10.53	10.66	9.17
O	12.41	11.64	9.83	10.85	8.89	12.40	14.18	10.68	12.66	10.37	14.93	15.34	10.50
N	16.10	12.97	11.17	12.19	11.16	13.25	14.80	12.46	11.49	11.81	18.08	20.01	13.44
D	22.87	17.47	12.23	13.29	13.22	16.41	18.68	14.38	14.76	13.48	24.62	24.01	14.66

TABLE III

Distribution of Monthly Mean Values in the Mörikofer Scale

	I			II			III			IV			V			VI			VII			VIII			IX			Xa			Xb			XI			XII		
	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c	a	b	c
0- 5		3			3		1	4	1		4			4			2			1			3			4		1	1			1						1		
5-10	4	3	4	4	4	4	5	3	5	6	3	5	6	3	6	5	3	3	2	4	3	5	4	5	5	3	5	3	4	1	1	3	2	1	4	2	4	4	3
10-15	3	2	3	4	3	4	3	5	5	3	5	4	4	3	5	3	4	5	6	3	4	5	5	5	5	5	6	6	5	8	4	2	5	3	3	3	5	6	7
15-20	2	2	2	4	2	4	3		1	3		3	1	1	1	4	3	4	3	4	3	2		1	2		1			1	2	3	1	4	4	2	2		1
20-30	3	2	3																1		2			1						5	3	4	3	1	5					
30-40													1	1																				1						

a = 08:30h
b = 13:30h
c = 18:30h

cooling - power values within this grade. The frequency however of each weather - type is different: Thus weather types III, IV, V, VIII and IX have the highest frequency, while weather - types Xb and XI have smaller frequencies, their cooling - power values tending rather towards the 10 mg cal cm^{-2} sec^{-1} grade. This means that when weather types Xb and XI prevail the loss of heat from the human body is more intense that with the remaining weather - types.

3) 10 - 15 mg cal cm^{-2} sec^{-1} grade: Cooling power values within this grade are distributed almost equally among all weather types.

4) 15 - 20 mg cal cm^{-2} sec^{-1} grade: every weather type may produce cooling power values within this grade, but with different frequency and different distribution of these values. Thus weather type Xa with one mean value, V with two, and weather types III, IV, VIII, IX and XII with more tending towards the value of 15 mg cal cm^{-2} sec^{-1}, indicate less capacity for loss of heat than the remaining types, (W.T:I, II, VI, VII, Xb, and XI) whose average cooling power values tend towards 20 mg cal cm^{-2} sec^{-1}.

5) $>$ 20 mg cal cm^{-2} sec^{-1} grade: Weather types Xb and XI prevail in this grade, since they produce the largest loss of heat. Weather type I also occurs in this grade, but much less than the previous two. Also weather type VII produces intense loss of heat with mean values slightly exceeding that of 20 mg cal cm^{-2} sec^{-1}.

B. Observation of 13 : 30 hours

1) 0 - 5 mg cal cm^{-2} sec^{-1} grade: Except for weather - type XI, all others produce monthly mean values within this grade: Weather - types VII, Xa, Xb and XII only one case each, meaning that they and W.T. VI have greater capacity of heat transfer, being more pleasant to man than weather types I, II, III, IV, V, VIII and IX which during the warm quarter of the year produce a *discomfortably warm* feeling.

2) 5 - 10 mg cal cm^{-2} sec^{-1} grade and 10 - 15 mg cal cm^{-2} sec^{-1} grade: Every weather - type may produce monthly mean c.p. values within these two grades.

3) 15 - 20 mg cal cm^{-2} sec^{-1} grade: Only weather - types I, II, VI, VII, Xb and XI have c.p. values within this grade, meaning that they induce loss of great amounts of heat, producing a *cold climate* during the cold season.

4) $>$ 20 mg cal cm^{-2} sec^{-1} grade: Here montly mean cooling-power values occur only with weather - types I, Xb and XI which, having

the greatest heat loss capacity, can be considered as the *coldest* weather-types.

Cooling - power Values with each Weather - type.

Here we examine the variation of monthly mean cooling - power values with each prevailing weather - type, with reference to CONRAD's climatic classification, for the three daily observations of 08 : 30, 13 : 30 and 18 : 30 hours.

Weather - type I: When this weather - type prevails 39 % of cooling - power monthly mean values register *hot climate*, another 39 % register *relaxing climate*, while the remaining 22 % of these values register *mild but bracing climate*. This means that W.T.I, during the cold season produces high cooling - power values because of the invasion of cold northerly air masses (LIVADAS [6]), while in the summer it results in very small cooling - power values, because of the prevailing clear sky (insolation) and comparative calm (FLOCAS - PENNAS [5]).

Weather - Type II: With this weather - type 42 % of monthly mean cooling - power values register *hot climate*, while the remaining 58 % register *relaxing climate*. The prevailing clear sky (FLOCAS - PENNAS [5]) and calm (LIVADAS [7]) produce conditions resulting in small cooling - power values in the summer. Besides, in winter too, because of the prevailing calm, cooling - power values can not reach the level of the corresponding figures of W.T.I.

Weather - Type III. When this weather - type prevails the transport of south component warm air masses (FLOCAS [4]) result in the formation of fogs (ANGOURIDAKIS [1]) while the winds blowing are rather light. Such conditions reduce cooling - power values below 17 mg cal cm^{-2} sec^{-1} ($<$ 14 mg cal. at 13 : 30 hours). Thus 53 % of c.p. values register *hot climate* while 47 % register *relaxing climate.*

Weather - Types IV and V. These two weather - types transport warm air masses, without a strong pressure gradient, while clear skies prevail (FLOCAS - PENNAS [5]). Such conditions generally reduce cooling - power values below 20 mg cal^{-2} cm sec^{-1}. Thus with W.T.IV, 50 % of c.p. values register *hot climate* and the other 50 % register *relaxing climate;* while with W.T. V* 53 % of c.p. values register *hot climate*,

* Weather-type V being very rare (Table I) especially in winter, cooling - power values (daily ones) for December have been recorded only once; consenquently we consider these results with a certain reserve.

42 % register *relaxing climate*, and the remaining 5 % register *very bracing climate.*

Weather - Type VI: Under the influence of this weather - type the blowing southerly warm winds and increased cloudiness do not allow for high cooling - power values in winter, or very small ones in summer: Thus 36 % of monthly mean values register *hot climate*, while the remaining 64 % register *relaxing climate.*

Weather - Type VII: When this type prevails it produces such heavy weather conditions with strong N - NE winds and heavy cloudiness, that result in the summer in relatively high cooling - power values, while in winter the prevailing heavy cloudiness preventing nocturnal radiation does not allow cooling - power values to reach the levels of corresponding values of W.T.I. Such conditions result in 28 % of c.p. values registering *hot climate*, 64 % registering *relaxing climate*, and only the remaining 8 % indicate *mild but bracing climate.*

Weather - Type VIII: With this weather - type westerlies and clear skies prevail and we have warm invasions (Floras [4]). Under such conditions 47 % of cooling power values register *hot climate*, *50 % relaxing climate*, and only the remaining 3 % register (18 : 30^h) *mild but bracing climate.* Cooling - power values exceed 15 mg cal cm^{-2} sec^{-1} only in January and February, meaning that when W.T. VIII prevails, we have small cooling power values because of the blowing warm winds, characterized in the summer under the name Lips or Livas (Λίψ - Λίβας).

Weather - Type IX: When this weather - type prevails, we have cloud dispersion and clearing of the sky, light winds or calm, especially during the night, and consequently the main factor influencing cooling-power is the temperature of the air, which is extremely high in the summer, and relatively high in winter because of the absence of air masses' transport. These conditions cause cooling power values to remain perceptibly small in summer and not very high in winter. Thus 47 % of these values register *hot climate*, and the remaining 53 % indicate *relaxing climate.*

Weather - Type Xa: This type rarely occurs and not in every month of the year *(Tables I, II)*, that is why we examine it with some reserve. This is actually a variation of W.T. VIII with more pronounced west component currents and warm air masses' transport. In such conditions, cooling power values never exceed 15 mg cal cm^{-2} sec^{-1}.

Weather - Type Xb: The prevailing weather pattern with heavy cloudiness and strong pressure gradient produces strong E-NE winds and decrease of air temperatures, resulting in extremely high cooling -

power values in winter and relatively high in the summer. Thus only 19 % of c.p. values indicate *hot climate*, *47* % *relaxing climate*, while the remaining 33 % register *mild but bracing climate.* In the summer cooling-power values tend towards the 10 mg cal cm^{-2} sec^{1-} level, causing a pleasant feeling of well - being.

Weather - Type XI: The strong cold north winds blowing, produce a deep drop of temperature. When this weather - type prevails in Thessaloniki, during the winter, blows the extremely cold local wind Vardaris, while in the summer we have the *etesian* winds. Under such conditions 19 % of cooling - power values register *hot climate*, 53 % register *relaxing climate*, *25* % *mild but bracing*, and 3 % register *very bracing climate.* Weather - Type XI has the same effect on cooling - power, as W.T. Xb, but in winter it produces higher values decause of the cold Vardaris wind.

Weather - Type XII: This weather - type resembles W.T.VI, whose precursor it actually is. However, W.T.XII produces smaller cooling - power values during the cold season than W.T.VI, since the air masses it transports are perceptibly warmer than those of W.T.VI.

CONCLUSIONS:

The effect of each weather type is more pronounced in winter; that is why, in winter, cooling - power values are characteristic for each type, while during the summer months cooling - power values differ less.

The May - October semester can be considered as the warm season and the remaining months as the cold one *(Table IV).*

In Table IV we observe that weather - types Xb and XI produce the highest c.p. values, in the warm as well as in the cold season. This is due to the fact of W.T.Xb being the type of cold invasioins, while W. T.XI produces the cold and dry local katabatic wind Vardaris.

Weather - Types VI and VII for the warm season, and I, II, VII for the cold one, come next. The smallest value for the warm season belongs to W.T.IX, and for the cold season to III, V and IX.

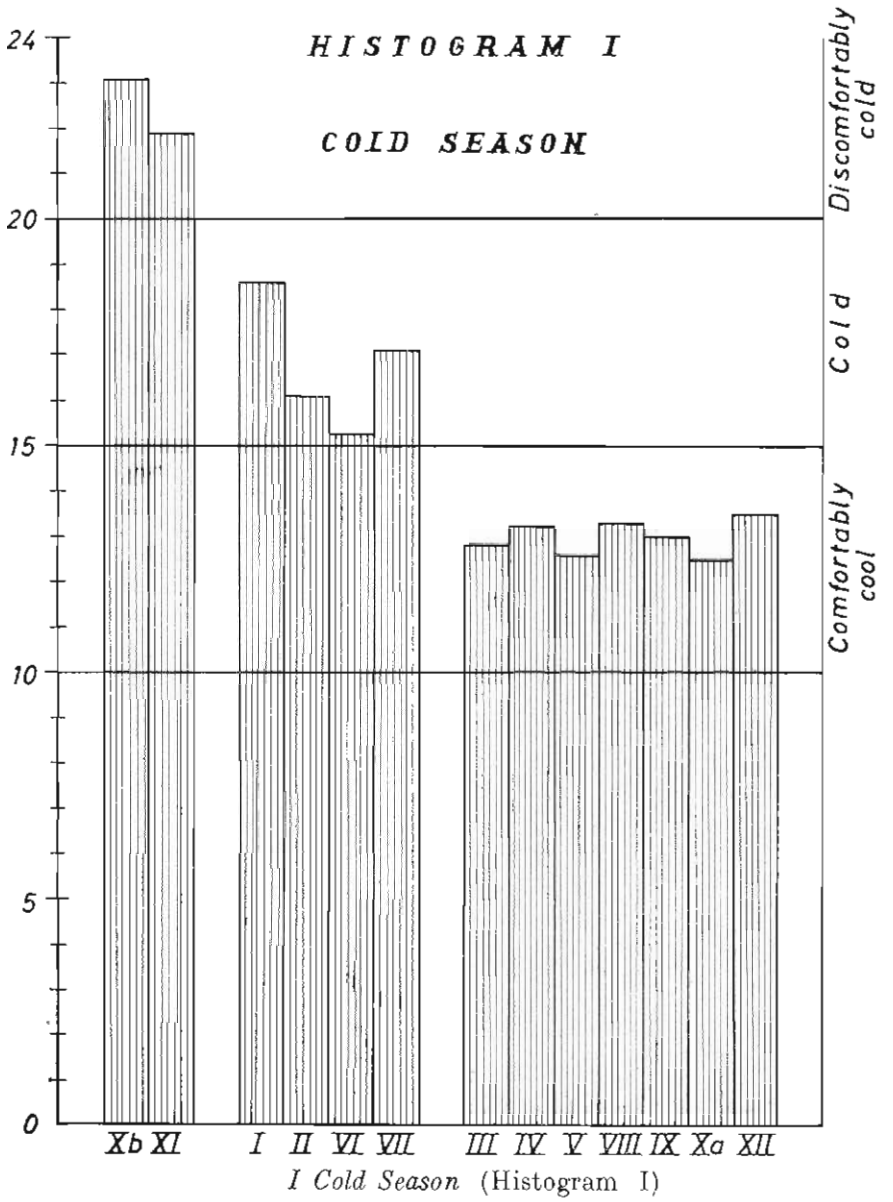
The largest frequency of absolute maxima belongs to W.T. Xb with XI, VII, I and II coming next, in that order. The smallest frequency of absolute maxima belongs to Weather - types III, IV and IX.

This study of weather - types may lead to the following classification:

TABLE IV

Mean Cooling - Power Values for the year, the warm and cold season

		I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
	08:30	12.98	12.61	11.67	11.38	8.97	13.69	15.04	11.13	9.67	9.53	19.46	18.11	12.70
ANNUAL	13:30	9.85	9.58	9.34	8.84	5.95	12.57	12.85	8.76	7.01	10.27	16.29	13.59	11.22
VALUES	18:30	12.73	12.10	11.47	11.85	8.35	14.62	15.64	11.97	10.01	13.50	17.84	16.30	13.19
	Mean	11.85	11.43	10.83	10.69	7.76	13.63	14.51	10.62	8.90	11.10	17.86	16.00	12.37
	08:30	9.10	8.34	8.02	8.04	7.93	9.26	11.20	8.33	7.44	9.17	12.83	12.88	8.42
WARM	13:30	5.83	5.27	5.98	4.92	4.51	7.79	8.07	4.69	4.38	6.43	9.04	8.31	7.54
SEASON	18:30	8.81	8.17	8.52	8.06	7.36	10.53	11.13	8.07	7.53	11.73	11.32	10.34	10.25
	Mean	7.91	7.26	7.51	7.01	6.60	9.19	10.13	7.03	6.45	9.11	11.06	10.51	8.74
	08:30	19.59	17.38	13.77	13.67	13.46	15.33	17.31	13.27	13.34	12.49	24.51	23.77	14.02
COLD	13:30	16.85	14.50	11.34	11.55	12.18	14.31	15.61	11.90	11.52	11.11	21.98	19.15	12.41
SEASON	18:30	19.29	16.49	13.17	14.37	12.13	16.13	18.42	15.12	14.26	13.92	22.80	22.54	14.14
	Mean	18.58	16.12	12.76	13.20	12.59	15.26	17.11	13.43	13.04	12.51	23.10	21.82	13.52

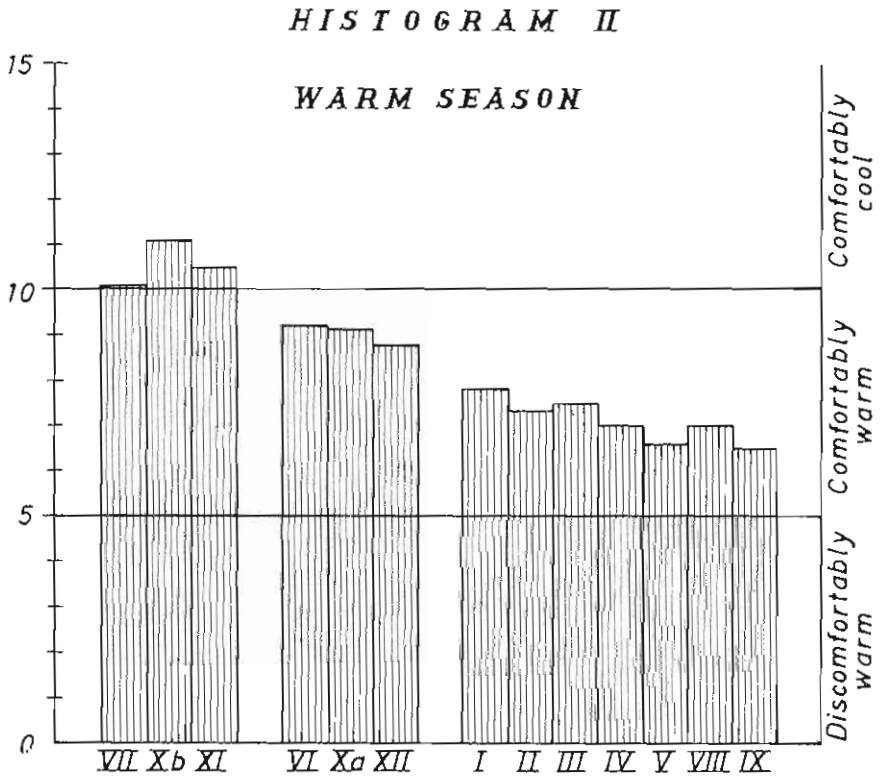


I Cold Season (Histogram I)

Group	A	Discomfortably Cold	Xb, XI
»	B	Cold	I, II, VI, VII
»	C	Comfortably Cool	III, IV, V, VIII, IX, Xa, XII

II Warm Season (Histogram II)

Group	A	Comfortably Cool	VII, Xb, XI
»	B	Comfortably Warm - Comfortably cool	VI, Xa, XII
»	C	Comfortably warm	I, II, III, IV, V, VIII, IX



This whole analysis shows that the feeling of well - being or discomfort is generally a function of the combination of season and weather - type. Thus the occurence of weather - types with great capacity for inducing heat loss in the summer and small inductive capacity in winter, produces ideal conditions for a feeling of well - being in men, the whole year round.

In the city of Thessaloniki the ideal cooling - power values for each month of the year, producing a feeling of well - being result from certain weather - types only, as mentioned in the following *Table V*.

TABLE V

Showing how each Weather - Type produces a comfortably cool climate in each month of the year.

	I	II	III	IV	V	VI	VII	VIII	IX	Xa	Xb	XI	XII
J			X	X				X	X	X			X
F			X	X	X			X	X	X			X
M			X	X	X			X	X	X			X
A	X	X	X	X	X	X	X	X	X	X			X
M	X	X	X	X	X	X	X	X	X	X	X	X	X
J						X	X			X	X	X	X
J							X					X	
A											X	X	
S	X	X				X	X				X	X	X
O	X	X	X	X	X	X	X	X	X	X	X	X	X
N		X	X	X	X			X	X	X			X
D			X	X				X	X				X

Data of the above Table V combined with the frequency of each weather - type, suggest that the climate of Thessaloniki should be clasified as a *«Relaxing climate»*.

REFERENCES

1. Angouridakis, V. E., «On weather conditions Reducing the Horizontal Visibility in Thessaloniki», Doctoral Thesis. Thessaloniki, (1966).
2. Balafoutis, Chr. J. and Livadas, G. C. : «The cooling - power in Thessaloniki». Sci. Annals, Vol. 12, P. 227-240.
3. Conrad and Pollak. : «Methods in Climatology», Harvard Univ. Press, Cambridge, Mass,
4. Flocas, A. A. (1970) : Συμβολὴ εἰς τὴν μελέτην τῶν θερμῶν εἰσβολῶν ἐν Ἑλλάδι. Διατριβὴ ἐπὶ διδακτορίᾳ.
   Contribution to the study of Warm Invasions in Greece. Doctoral Thesis. Thessaloniki.
5. Flocas, A. A. and Pennas, P. J. : «Weather - types and Sunshine - Duration in the west coast of the Aegean Sea», Thessaloniki, (1972).
6. Livadas, 1955 : Περὶ τῶν καιρικῶν συνθηκῶν ὁμάδων ἡμερῶν ἀποτόμου μειώσεως τῆς θερμοκρασίας ἐν Ἑλλάδι. Θεσσαλονίκη,
   «On weather conditions of groups of days with sudden decrease of temperature in Greece», Doctoral Thesis. Thessaloniki, (1955).

7. LIVADAS, G. C. 1962 : 'Ο καιρὸς τῆς πάχνης ἐν 'Ελλάδι. 'Επιστ. 'Επετ. Φ. Μ. Σχολῆς Παν. Θεσσαλονίκης. Παράρτ. 12.
«Hoar-frost Weather in Greece». Scientific Annales of the Faculty of Physics and Mathematics, Aristotelian University of Thessaloniki, Appendix No. 12), (1962).
8. LIVADAS, G. C. : «The Cooling Power in Thessaloniki - Greece». Meteorologica No 12 (Univ. of Thessaloniki, (1971).
9. LIVADAS, G. C. and BALAAFOUTIS, CHR. J. : «The Cooling Power in Thessaloniki Greece (II)» Meteorologica No 15, Reprint of the Scientific Annales of the faculty of Physics and Mathematics, Aristotelian University of Thessaloniki, Vol. 11, pp. 605-620 (1971).
10. MÖRIKOFER, W. : «Acta Davossiana», 1 (No 3), (1933).

ΠΕΡΙΛΗΨΙΣ

ΤΑΧΥΤΗΣ ΑΠΟΨΥΞΕΩΣ ΚΑΙ ΤΥΠΟΙ ΚΑΙΡΟΥ ΕΝ ΘΕΣΣΑΛΟΝΙΚΗ

Ὑπὸ

ΧΡΗΣΤΟΥ Ι. ΜΠΑΛΑΦΟΥΤΗ

Μελετᾶται διὰ τὴν πόλιν τῆς Θεσσαλονίκης ἡ τιμὴ τῆς ταχύτητος ἀποψύξεως συναρτήσει τῶν ἑκάστοτε ἐπικρατησάντων τύπων καιροῦ, κατὰ τὴν χρονικὴν περίοδον ἀπὸ 1.1.1957 μέχρι 31.12.1970, καὶ διὰ τὰς ὥρας παρατηρήσεων 08 : 30, 13 : 30 καὶ 18 : 30.

Ἀναλύονται αἱ τιμαὶ ἀποψύξεως κατὰ τύπον καιροῦ, ἤτοι κατὰ τὴν ἐπικρατήσασαν ἑκάστοτε καιρικὴν κατάστασιν, τόσον κατὰ τὴν ψυχράν, ὅσον καὶ κατὰ τὴν θερμὴν περίοδον, καὶ δίδεται αἰτιολόγησις αὐτῶν.

Κατόπιν κατατάσσονται οἱ τύποι καιροῦ συμφώνως πρὸς τὴν κατάταξιν Mörikofer, εἰς ὁμάδας, τόσον διὰ τὴν θερμὴν ὅσον καὶ διὰ τὴν ψυχρὰν περίοδον. Ἐκ τῆς κατατάξεως ταύτης προκύπτει ὅτι, οἱ τύποι καιροῦ, οἱ ὁποῖοι δίδουν τὸ πλέον ἔντονον αἴσθημα ψύχους, τόσον κατὰ τὴν ψυχρὰν ὅσον καὶ κατὰ τὴν θερμὴν περίοδον, εἶναι ὁ τύπος Χβ, ἤτοι ὁ τύπος τῆς ψυχρᾶς εἰσβολῆς, καὶ ὁ τύπος XI, ἤτοι ὁ τύπος, κατὰ τὴν ἐπικράτησιν τοῦ ὁποίου πνέει εἰς τὴν περιοχὴν ὁ τοπικὸς ἄνεμος Βαρδάρης.