J. FINDLAY

Note + file in book

65 Meter Radiotelescope Project
Victor Herrero
Memorandum # 2
October 23, 1970

Thermal climatology from Site Survey files, for Performance Evaluation purposes.

To: J. Findlay, S. von Hoerner

On October 21, Sebastian asked me to collect samples of data on temperature fluctuations at locations representative of those currently contemplated as possible sites for the telescope.

I include in this memorandum the following data:

a) Southwest desert plain sites

Annual climatological summary for Tucson
3-hourly observations for Tucson in July 1970

b) Arizona-New Mexico mountain sites

Weekly temperature fluctuation summaries for Kitt Peak and related Arizona Mountains
Microthermal fluctuations for Kitt Peak and Junipero Serra (California)
Thermo-hydrographic record for 6 days in July 1970 at Kitt Peak

c) California mountain sites

Junipero Serra and Piper Mountain monthly temperature fluctuation summary
Thermograph record sample for Junipero Serra, Piper Mountain and Lick Observatory (Mt. Hamilton)

d) Chilean sites

Monthly summaries for Cerro Tololo, La Peineta and Checo
Thermo-hydrographic records for Tololo, Copiapo and La Peineta

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

LOCAL CLIMATOLOGICAL DATA

U.S. DEPARTMENT OF COMMERCE
MAURICE H. STANS, Secretary
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
ENVIRONMENTAL DATA SERVICE

TUCSON, ARIZONA
INTERNATIONAL AIRPORT
JULY 1970

Latitude 32° 07' N Longitude 110° 56' W Elevation (ground) 2584 ft. Standard time used: MOUNTAIN

Date	Temperature (°F) Maximum	Minimum	Average	Departure from normal	Average dew point	Degree days (Base 65°) Heating	Cooling	Weather types on dates of occurrence	Snow, ice pellets or ice on ground at 05AM (In.)	Precipitation Water equivalent (In.)	Snow, ice pellets (In.)	Avg. station pressure (In.) Elev. 2555 feet m.s.l.	Wind Resultant direction	Resultant speed (m.p.h.)	Average speed (m.p.h.)	Fastest mile Speed (m.p.h.)	Direction	Sunshine Hours and tenths	Percent of possible	Sky cover (Tenths) Sunrise to sunset	Midnight to midnight	Date
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	87	74	81	-5	54	0	16		0	T	0	27.39	15	6.0	9.1	24	E	8.5	60	10	8	1
2	99	76	88	2	57	0	23	3	0	0	0	27.39	15	7.4	10.1	20	S	10.7	75	8	8	2
3	103	75	89	3	54	0	24		0	0	0	27.36	18	3.1	9.1	26	W	12.1	85	3	3	3
4	103	75	89	3	52	0	24	3	0	T	0	27.36	16	6.8	9.6	21	N	10.8	76	4	3	4
5	104	72	88	2	45	0	23		0	0	0	27.33	16	4.0	7.3	17	S	12.6	89	2	2	5
6	102	77	90	4	53	0	25	3	0	T	0	27.33	29	3.9	12.5	29	S	10.6	74	3	4	6
7	99	73	86	-1	54	0	21	3	0	.06	0	27.34	20	4.4	10.8	23	S	13.1	92	6	7	7
8	97	72	85	-2	55	0	20	3	0	T	0	27.34	27	3.2	9.1	31	W	8.8	62	7	8	8
9	100	72	86	-1	50	0	21		0	T	0	27.32	22	4.5	8.9	30	W	9.2	65	8	6	9
10	99	75	87	0	50	0	22		0	0	0	27.36	18	4.7	7.6	20	S	10.2	72	8	6	10
11	102	73	88	1	50	0	23		0	0	0	27.34	29	2.6	8.9	17	N	14.1	100	1	2	11
12	105	76	91	4	46	0	26		0	0	0	27.30	28	2.9	9.2	19	W	12.8	90	4	3	12
13	106	80	93	6	47	0	28		0	T	0	27.26	12	1.5	8.6	30	SE	11.4	81	8	8	13
14	106	82	94*	7	52	0	29	3	0	T	0	27.27	16	4.8	9.9	34	SE	10.1	71	6	7	14
15	106*	75	91	4	52	0	26		0	T	0	27.28	24	1.8	7.1	18	NW	12.0	86	4	6	15
16	104	79	92	5	53	0	27		0	T	0	27.27	14	6.3	8.5	17	E	11.2	80	3	2	16
17	105	77	91	4	53	0	26		0	0	0	27.21	13	9.5	10.4	18	E	13.1	93	1	2	17
18	103	79	91	4	60	0	26		0	0	0	27.26	27	7.0	11.8	26	N	12.9	92	4	5	18
19	102	72	87	0	62	0	22	3	0	1.39	0	27.30	32	3.3	8.8	59	W	12.6	90	2	4	19
20	94	69*	82	-5	66	0	17	3	0	.96	0	27.35	32	4.1	8.3	47	NE	8.2	59	9	9	20
21	86	71	79*	-8	68	0	14	3	0	.07	0	27.36	21	.7	5.9	25	W	3.8	27	10	10	21
22	94	72	83	-4	65	0	18	3	0	T	0	27.25	16	4.2	8.1	18	S	10.8	77	10	8	22
23	95	76	86	-1	62	0	21		0	0	0	27.23	20	5.5	8.3	14	S	7.7	55	6	6	23
24	96	77	87	0	61	0	22		0	T	0	27.31	24	4.1	8.6	24	W	10.2	73	9	9	24
25	96	76	86	-1	62	0	21		0	0	0	27.35	21	4.1	10.4	26	S	10.9	79	4	5	25
26	97	73	85	-2	62	0	20	3	0	.02	0	27.30	25	3.0	8.9	25	S	11.8	85	3	5	26
27	97	73	85	-2	63	0	20	3	0	.02	0	27.23	23	4.0	9.6	18	W	10.4	75	3	6	27
28	95	76	86	0	62	0	21		0	0	0	27.27	16	6.3	11.4	34	E	7.7	56	10	9	28
29	97	74	86	0	62	0	21		0	0	0	27.34	15	1.9	8.9	17	N	12.2	88	3	3	29
30	102	76	89	3	59	0	24		0	T	0	27.24	28	3.0	8.8	33	E	11.1	80	5	6	30
31	99	75	87	1	62	0	22	3	0	.01	0	27.23	14	6.5	12.7	35	SE	9.1	66	8	9	31
	Sum	Sum				Total	Total			Total	Total	For the month:						Total	%	Sum	Sum	
	3080	2322				0	693	Number of days		2.53	0	27.31	19	2.5	9.3	59	W	330.7	for	172	179	
	Avg.	Avg.	Avg.	Dep.	Avg.	Dep.	Dep.	Precipitation		Dep.						Date:	19	Possible	month	Avg.	Avg.	
	99.4	74.9	87.2	0.9	56	0		≥ .01 inch	7	0.47								434.7	76	5.5	5.8	

Number of days				Season to date		Snow, ice pellets ≥ 1.0 inch	0
Maximum Temp.		Minimum Temp.		Total	Total	Thunderstorms	13
≥ 90 ‡	≤ 32	≤ 32	≤ 0	0	1617	Heavy fog X	0
29	0	0	0	Dep. 0	Dep.	Clear 10	Partly cloudy 10 Cloudy 11

Greatest in 24 hours and dates: Precipitation		Snow, ice pellets	Greatest depth on ground of snow, ice pellets or ice and date
2.25	19-20	0	0

HOURLY PRECIPITATION (Water equivalent in inches)

Date	A.M. Hour ending at 1	2	3	4	5	6	7	8	9	10	11	12	P.M. Hour ending at 1	2	3	4	5	6	7	8	9	10	11	12	Date
1															T	T	T	T	T						1
2																									2
3																									3
4														T	T	T	T								4
5																									5
6																		T	T				T	T	6
7	T																					.06	T		7
8																	T								8
9															T		T	T							9
10																									10
11																									11
12																									12
13																				T	T				13
14																	T	T	T						14
15																							T	T	15
16														T											16
17																									17
18																									18
19																						1.07	.27	.05	19
20	.01	T						T	T										.03	.77	.05	.04	.03	.03	20
21	.01	.03	.01	T	T									.01	.01	T									21
22																								T	22
23																									23
24																T									24
25																									25
26																					T	.01	.01	T	26
27																	.01	.01			T	T			27
28																									28
29																									29
30																			T	T					30
31										T	T									T	T	T	T	.01	31

* Extreme temperatures for the month. May be the last of more than one occurrence.
– Below zero temperature or negative departure from normal.
‡ ≥ 70° at Alaskan stations.
+ Also on an earlier date, or dates.
X Heavy fog restricts visibility to 1/4 mile or less.
T In the Hourly Precipitation table and in columns 9, 10, and 11 indicates an amount too small to measure.
The season for degree days begins with July for heating and with January for cooling.
Data in columns 6, 12, 13, 14, and 15 are based on 8 observations per day at 3-hour intervals.
Wind directions are those from which the wind blows. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. Figures for directions are tens of degrees from true North; i.e., 09 = East, 18 = South, 27 = West, 36 = North, and 00 = Calm. When directions are in tens of degrees in Col. 17, entries in Col. 16 are fastest observed 1-minute speeds. If the / appears in Col. 17, speeds are gusts.

Any errors detected will be corrected and changes in summary data will be annotated in the annual summary.

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I certify that this is an official publication of the Environmental Science Services Administration, and is compiled from records on file at the National Climatic Center, Asheville, North Carolina 28801.

William H. Haggard
Director, National Climatic Center

SUMMARY BY HOURS

Hour (Local time)	Averages: Sky cover (in tenths)	Station pressure (In.)	Dry bulb (°F)	Wet bulb (°F)	Rel. hum. %	Dew point (°F)	Wind speed (m.p.h.)	Resultant wind: Direction	Speed (m.p.h.)
02	5	27.31	80	66	51	58	8.3	16	5.6
05	5	27.32	77	65	56	59	7.9	16	7.3
08	5	27.36	82	67	48	59	7.3	18	5.3
11	4	27.35	91	68	33	56	7.3	33	1.7
14	5	27.29	96	68	26	53	10.1	30	5.4
17	7	27.24	96	68	26	53	13.7	27	2.4
20	8	27.27	90	67	33	54	9.3	19	1.3
23	7	27.32	83	67	46	58	10.0	18	5.8

OBSERVATIONS AT 3-HOUR INTERVALS

DAY 01

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		79	58	29	44	25	9
05	6	UNL	30		76	63	50	56	16	4
08	10	120	50		80	64	44	56	34	4
11	9	140	45		85	64	32	52	18	4
14	10	130	50		86	63	27	48	13	5
17	10	110	50	RW	82	65	41	56	13	15
20	10	110	50		82	67	46	59	14	9
23	10	120	30		80	67	52	61	13	13

DAY 02

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	150	30		78	67	60	63	12	12
05	10	130	30		77	67	60	62	14	12
08	9	130	50		80	68	56	63	14	10
11	9	120	50		86	69	43	61	11	5
14	4	UNL	50		93	69	30	57	29	7
17	10	250	50		95	65	19	46	17	11
20	10	UNL	50		89	65	28	52	20	5
23	3	UNL	30		82	64	37	53	13	8

DAY 03

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	3	UNL	30		80	64	44	56	15	8
05	0	UNL	30		76	63	50	56	15	12
08	0	UNL	50		82	67	47	60	19	5
11	0	UNL	50		94	69	29	57	00	0
14	6	80	50		100	67	17	48	07	7
17	9	250	50		102	67	16	47	35	11
20	3	UNL	40		90	67	31	55	24	15
23	0	UNL	30		86	66	36	56	18	5

DAY 04

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		78	63	45	55	18	6
05	0	UNL	30		76	63	50	56	16	5
08	0	UNL	50		83	68	46	60	16	10
11	0	UNL	45		97	67	20	50	13	11
14	8	75	50		100	66	16	46	09	11
17	9	140	50		99	66	17	47	17	15
20	7	140	50		93	66	24	51	26	9
23	0	UNL	30		86	64	30	51	00	0

DAY 05

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		76	61	42	51	24	4
05	0	UNL	30		74	61	50	54	12	4
08	0	UNL	50		83	64	34	52	18	12
11	0	UNL	50		96	64	17	44	17	7
14	3	UNL	50		102	64	10	35	08	11
17	7	75	50		101	63	10	34	14	4
20	8	80	50		99	63	12	37	34	4
23	0	UNL	30		88	65	30	53	20	5

DAY 06

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		82	63	37	53	17	5
05	0	UNL	45		78	62	40	52	14	6
08	0	UNL	50		84	64	34	53	20	6
11	2	UNL	50		93	66	23	50	30	10
14	0	UNL	50		102	68	17	49	30	11
17	10	120	45	T	96	67	21	50	06	20
20	8	300	30		86	68	40	59	29	14
23	9	120	30	RW	82	65	41	56	26	15

DAY 07

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	9	300	30		79	64	45	56	13	4
05	2	UNL	45		74	63	58	58	13	9
08	6	UNL	50		81	64	41	55	16	8
11	5	UNL	50		92	67	27	53	30	9
14	4	UNL	50		98	67	20	50	27	15
17	6	UNL	50		95	66	21	49	20	14
20	10	UNL	50		91	64	23	48	17	10
23	10	90	30		78	68	60	63	02	6

DAY 08

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	140	30		75	66	62	61	33	10
05	10	140	30		74	65	64	61	17	5
08	1	UNL	50		80	65	45	57	05	5
11	3	UNL	50		90	66	27	52	24	5
14	10	UNL	50		95	66	20	48	30	10
17	10	300	50		92	66	26	52	15	7
20	10	UNL	50		86	65	33	54	16	6
23	8	150	30		81	65	44	57	28	15

DAY 09

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		76	64	52	57	16	8
05	5	UNL	30		74	62	54	56	14	5
08	9	250	50		82	64	41	56	20	5
11	5	UNL	50		93	65	21	48	24	5
14	8	280	50		97	64	15	42	32	5
17	10	60	50	RW	94	64	18	45	28	20
20	9	120	30		90	63	22	46	17	8
23	5	UNL	30		84	63	32	51	16	6

DAY 10

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		77	62	45	54	16	9
05	10	140	30		75	62	46	53	14	8
08	9	300	50		82	63	37	53	16	10
11	9	300	50		89	65	27	51	26	4
14	8	300	50		96	66	19	48	27	9
17	10	150	50		96	64	15	42	31	3
20	7	UNL	30		90	64	24	49	17	6
23	3	UNL	30		83	62	31	49	16	4

DAY 11

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		78	62	40	52	17	4
05	0	UNL	30		74	61	50	54	17	8
08	0	UNL	50		83	64	36	53	15	6
11	0	UNL	50		94	66	22	50	04	6
14	2	UNL	50		101	67	16	47	32	10
17	5	UNL	50		101	67	16	47	32	9
20	3	UNL	50		97	66	18	47	33	9
23	10	UNL	30		90	64	23	47	25	10

DAY 12

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	1	UNL	30		83	62	31	49	12	7
05	5	UNL	30		77	61	39	50	18	5
08	6	UNL	50		81	62	35	51	16	5
11	3	UNL	50		96	65	17	45	31	6
14	2	UNL	50		104	67	14	45	25	11
17	2	UNL	50		104	67	14	45	34	15
20	3	UNL	45		98	65	16	44	32	9
23	3	UNL	30		91	62	18	42	20	6

DAY 13

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	2	UNL	30		87	60	20	41	26	6
05	8	300	30		82	60	27	45	16	7
08	10	UNL	50		91	63	21	46	20	4
11	10	UNL	50		97	65	17	46	04	6
14	10	UNL	50		102	67	14	45	34	8
17	3	UNL	50		105	69	16	50	34	8
20	9	60	30	RW	94	66	23	51	14	9
23	10	80	30		90	66	27	52	12	12

DAY 14

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	140	30		90	65	25	50	12	13
05	8	UNL	30		87	65	30	52	15	6
08	8	UNL	50		90	65	26	51	00	0
11	4	UNL	50		99	68	20	51	36	7
14	4	UNL	50		104	68	15	48	28	9
17	10	80	50	TRW	91	68	30	55	18	21
20	10	300	50		92	67	28	54	08	5
23	7	UNL	30		85	66	39	57	16	8

DAY 15

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	UNL	30		83	65	37	54	15	8
05	8	UNL	30		76	62	48	55	18	5
08	5	UNL	50		85	66	36	55	18	6
11	7	120	45		98	68	21	52	24	4
14	2	UNL	50		103	69	17	50	29	7
17	4	UNL	50		105	70	16	51	34	10
20	6	300	45		101	67	16	47	36	5
23	8	90	30	RW	94	66	22	50	19	4

DAY 16

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	2	UNL	30		87	62	25	47	13	8
05	3	UNL	45		81	68	53	62	18	7
08	0	UNL	45		84	70	49	63	18	10
11	2	UNL	55		97	69	24	54	12	11
14	9	170	50		100	69	21	53	02	5
17	1	UNL	50		103	67	14	45	13	8
20	1	UNL	45		98	64	14	41	09	5
23	0	UNL	30		87	68	39	59	18	5

DAY 17

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		82	69	53	63	16	6
05	0	UNL	50		78	67	58	62	15	6
08	0	UNL	50		84	69	48	62	14	4
11	1	UNL	50		96	69	25	55	12	10
14	5	UNL	50		105	68	15	48	13	14
17	1	UNL	50		104	66	13	43	12	13
20	1	UNL	50		99	63	12	38	09	9
23	5	UNL	30		93	67	26	53	17	10

DAY 18

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	UNL	30		86	68	42	60	22	13
05	7	UNL	50		80	69	56	63	19	12
08	8	UNL	50		83	69	51	63	20	5
11	2	UNL	50		92	70	34	60	29	6
14	0	UNL	50		100	71	24	57	34	4
17	1	UNL	50		102	71	22	56	33	14
20	8	300	50		98	70	25	56	32	15
23	7	UNL	30		91	71	39	63	27	13

DAY 19

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	2	UNL	30		84	71	55	66	17	7
05	2	UNL	50		81	69	56	64	16	6
08	0	UNL	50		85	69	46	62	36	5
11	0	UNL	50		92	71	38	63	31	7
14	0	UNL	50		97	71	28	59	01	9
17	7	300	50		100	71	24	57	33	12
20	10	140	40		96	70	27	57	11	3
23	10	30	15	TRW	73	71	90	70	28	12

DAY 20

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	50	30		79	68	58	63	08	9
05	10	140	45		78	69	64	65	00	0
08	10	130	50	RW	77	70	69	66	26	4
11	5	UNL	50		85	71	53	66	32	7
14	7	UNL	50		91	73	42	65	32	12
17	5	UNL	45		94	73	38	65	28	12
20	10	50	6	TRW	72	67	79	65	03	8
23	10	50	15	RW	72	70	90	69	23	6

DAY 21

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	50	20	RW	72	70	90	69	00	0
05	10	50	30		73	71	90	70	32	3
08	10	150	50		77	70	71	67	11	7
11	10	150	50		84	72	57	67	36	7
14	10	150	40	RW	74	69	79	67	29	8
17	10	300	50		79	70	65	66	22	5
20	10	300	50		79	70	67	67	16	5
23	10	300	30		76	71	76	68	16	6

DAY 22

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	3	UNL	30		75	69	76	67	15	10
05	8	UNL	45		73	68	79	66	14	9
08	10	UNL	50		78	70	69	67	20	6
11	10	UNL	50		85	70	49	64	06	6
14	8	UNL	45		91	71	38	62	27	6
17	10	UNL	45		93	70	33	60	32	5
20	9	UNL	50		85	71	51	65	17	9
23	6	120	30		83	71	57	66	16	5

DAY 23

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	2	UNL	30		79	70	65	66	18	6
05	2	UNL	45		77	69	67	65	16	7
08	4	UNL	50		83	70	53	64	20	5
11	1	UNL	50		90	70	37	60	30	4
14	8	300	50		92	70	34	60	24	8
17	10	250	50		91	70	35	60	21	13
20	9	250	50		86	68	42	60	16	10
23	7	UNL	30		84	67	43	59	34	5

DAY 24

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	250	30		79	68	58	63	00	0
05	10	120	30		79	68	55	62	13	5
08	9	UNL	50		82	68	51	62	24	4
11	8	UNL	50		88	69	40	61	24	5
14	8	280	50		96	70	28	58	27	20
17	9	UNL	50		92	70	34	60	32	11
20	9	UNL	50		89	70	39	61	18	7
23	7	UNL	30		84	69	49	63	14	8

DAY 25

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	UNL	30		80	67	52	61	21	9
05	0	UNL	45		77	66	58	61	15	10
08	0	UNL	50		81	68	53	62	16	5
11	0	UNL	50		89	70	41	62	36	8
14	8	60	50		94	72	35	62	27	12
17	5	UNL	50		96	71	30	60	30	10
20	9	120	50		82	67	49	61	13	5
23	6	UNL	30		77	68	64	64	18	13

DAY 26

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	8	300	30		76	68	69	65	18	7
05	8	120	45		74	68	74	65	18	10
08	0	UNL	50		78	68	62	64	19	5
11	0	UNL	50		88	68	38	59	32	7
14	2	UNL	50		93	69	31	58	32	5
17	4	UNL	50		95	70	29	58	33	13
20	10	80	30		92	69	32	58	35	4
23	10	70	20	TRW	74	69	76	66	20	11

DAY 27

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	120	30		74	69	79	67	22	3
05	9	110	30		74	68	74	65	16	9
08	0	UNL	50		80	68	56	63	14	8
11	0	UNL	50		89	71	44	64	35	5
14	0	UNL	50		94	70	31	59	36	7
17	9	90	45	TRW	86	71	48	64	26	20
20	10	150	45		85	68	43	60	26	8
23	10	140	30		85	68	43	60	18	7

DAY 28

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	110	30		80	69	58	64	18	9
05	2	UNL	30		78	67	58	62	18	9
08	10	UNL	50		78	69	64	65	26	6
11	10	290	45		85	69	45	61	34	4
14	10	UNL	50		93	70	32	59	32	5
17	10	300	45		87	70	43	62	11	24
20	10	300	50		82	67	47	60	18	11
23	10	300	30		80	67	51	60	16	11

DAY 29

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	0	UNL	30		76	68	66	64	14	11
05	3	UNL	30		75	68	71	65	14	7
08	0	UNL	50		79	69	62	65	18	5
11	0	UNL	50		87	71	46	64	04	6
14	2	UNL	50		93	71	34	61	36	5
17	9	UNL	50		96	71	30	60	22	8
20	4	UNL	50		92	68	31	57	35	12
23	1	UNL	30		83	66	41	57	19	8

DAY 30

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	140	30		80	69	58	64	18	5
05	3	UNL	30		78	67	58	62	17	4
08	4	UNL	50		84	69	48	62	22	6
11	0	UNL	50		92	69	32	58	32	9
14	4	UNL	50		98	70	25	56	32	10
17	10	80	50		100	70	21	54	32	14
20	10	80	30		95	67	23	52	24	3
23	10	75	30		84	68	46	61	14	10

DAY 31

Hour	Sky Cover (Tenths)	Ceiling (Hnds of Ft)	Visibility (Whole Miles)	Weather	Dry Bulb (°F)	Wet Bulb (°F)	Rel. Hum. (%)	Dew Pt. (°F)	Wind Dir	Wind Speed (Knots)
02	10	300	30		82	68	51	62	12	7
05	10	120	30		80	68	54	62	13	9
08	10	120	45		85	70	48	63	20	16
11	10	140	50		86	71	50	65	16	6
14	3	UNL	50		95	69	28	57	33	7
17	3	UNL	50		98	70	25	56	26	5
20	10	70	30	TRW	85	70	48	63	06	15
23	10	90	30	RW	79	69	60	64	14	23

ADDITIONAL DATA
Other observational data contained in records on file can be furnished at cost via microfilm, microfiche, or paper copies of the original records. Inquiries as to availability and costs should be addressed to: Director, National Climatic Center, Federal Building, Asheville, N. C. 28801

STATION: TUCSON ARIZONA

YEAR & MONTH: 70 07

NOTES

CEILING COLUMN—

UNL indicates an unlimited ceiling.

WEATHER COLUMN—

- • Tornado
- T Thunderstorm
- Q Squall
- R Rain
- RW Rain showers
- ZR Freezing rain
- L Drizzle
- ZL Freezing drizzle
- S Snow
- SP Snow pellets
- IC Ice crystals
- SW Snow showers
- SG Snow grains
- IP Ice pellets
- A Hail
- F Fog
- IF Ice fog
- GF Ground fog
- BD Blowing dust
- BN Blowing sand
- BS Blowing snow
- BY Blowing spray
- K Smoke
- H Haze
- D Dust

WIND COLUMNS—

Directions are those from which the wind blows, indicated in tens of degrees from true North; i. e., 09 for East, 18 for South, 27 for West. Entry of 00 in the direction column indicates calm.

Speed is expressed in knots; multiply by 1.15 to convert to miles per hour.

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

U.S. DEPARTMENT OF COMMERCE
MAURICE H. STANS, Secretary
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
ROBERT M. WHITE, Administrator
ENVIRONMENTAL DATA SERVICE
WOODROW C. JACOBS, Director

LOCAL CLIMATOLOGICAL DATA

ANNUAL SUMMARY WITH COMPARATIVE DATA

1969

TUCSON, ARIZONA

NARRATIVE CLIMATOLOGICAL SUMMARY

Within 10 to 15 miles of the station the terrain is flat or gently rolling, with many dry washes. There is a general increase in elevation from north and northwest to south and southeast. Rugged mountain ranges and jutting hills encircle the valley floor. The higher mountains to the north, east, and south reach up to over 5,000 feet above the airport, and are at distances of 25 to 40 miles. To the west, the hills and smaller mountains range from 500 to 4,000 feet above the airport; all are more than 5 miles distant.

The soil cover is rather sandy, and native vegetation is mostly brush, cacti, and small trees, typical of the low latitude desert climate. The metropolitan area of Tucson lies at the foot of the Catalina Mountains, to the north of the airport. As a result of the lower elevation and more protected location of the City, recorded maximum temperatures are usually higher there than at the airport and minimum temperatures are correspondingly lower than at the airport.

As might be expected from its geographical situation, the climate of Tucson is prominently characterized by a long, hot season, beginning in April and ending in October. From May through September, maximum temperatures above 90° are the rule, with the mean maximum occasionally exceeding 100° in July. Under usual conditions, the diurnal temperature range is large, averaging almost 30°, although it may exceed 40°. Clear skies or very thin high clouds permit intense surface heating during the day and active radiational cooling at night, a process enhanced by the characteristic atmospheric dryness. The average growing season in the Tucson area approximates 250 days.

The distribution of precipitation through the year is such that more than 50 percent of the annual amount usually falls between July 1 and September 15 and a secondary maximum from December through March provides over 20 percent of the yearly precipitation. During the July-September period scattered convective or orographic showers and thunderstorms occur that often fill dry washes to overflowing. On occasion, brief, torrential downpours cause spectacular and destructive flash floods in sections of the metropolitan area, sometimes from short-period falls of over 1.50 inches. Hail rarely falls in thunderstorms, and sleet is an almost unknown form of precipitation. The December through March precipitation is more general and occurs as prolonged rainstorms that provide much needed replenishment of ground water. During these storms, snow often falls on the higher mountains, but snow in Tucson itself is infrequent, particularly in accumulations exceeding an inch in depth.

Relative humidity shows a pronounced daily oscillation in line with the usual large daily range in temperature. From near the first of the year, the average relative humidity decreases steadily until July and the beginning of the thunderstorm season, when it shows a marked increase. By the middle of September, and end of the thunderstorm season, it decreases again, resuming the upward climb in late November. Only occasionally during the summer is relative humidity high enough to produce appreciable physical discomfort, and then only for short periods. During the hot season, relative humidity values may fall below 10 percent during afternoons, and sometimes below 5 percent. The low average wet bulb temperature during hot weather makes evaporative air coolers effective most of the time.

Tucson lies in the zone receiving more sunshine than any other section of the United States; the persistence of the bright sunshine is one of the most noteworthy features of this desert climate. Cloudless days are commonplace, and average cloudiness, much of it being very thin cirriform clouds, is low.

Surface winds are generally light, with no important seasonal changes in either velocities or prevailing direction. Occasional windstorms cause localized duststorms, particularly in the outlying sections of Tucson where the ground has been disturbed in numerous development areas. During the spring months, winds may briefly be strong enough to cause some damage to trees and buildings. Wind velocities and directions are influenced to an important extent by the surrounding mountains, as well as by the general slope of the terrain. With weak pressure gradients, local winds tend to be in the SE quadrant during the night and early morning hours, veering to NW during the day. Highest velocities usually occur with winds from the SW and E to S.

While dust and haze of local origin are frequently visible, their effect on the general clarity of the atmosphere is not great. Visibility values are normally high; and fog is extremely rare.

METEOROLOGICAL DATA FOR THE CURRENT YEAR

Station: TUCSON, ARIZONA INTERNATIONAL AIRPORT Standard time used: MOUNTAIN Latitude: 32° 07' N Longitude: 110° 56' W Elevation (ground): 2584 feet Year: 1969

Month	Temperature – Averages – Daily maximum	Temperature – Averages – Daily minimum	Temperature – Averages – Monthly	Temperature – Extremes – Highest	Temperature – Extremes – Date	Temperature – Extremes – Lowest	Temperature – Extremes – Date	Degree days (Base 65°) – Heating	Degree days (Base 65°) – Cooling	Precipitation – Total	Precipitation – Greatest in 24 hrs.	Precipitation – Date	Snow, Ice pellets – Total	Snow, Ice pellets – Greatest in 24 hrs.	Snow, Ice pellets – Date	Relative humidity – Hour 05 (Local time)	Relative humidity – Hour 11 (Local time)	Relative humidity – Hour 17 (Local time)	Relative humidity – Hour 23 (Local time)	Wind & – Resultant – Direction	Wind & – Resultant – Speed	Wind & – Average speed	Wind & – Fastest mile – Speed	Wind & – Fastest mile – Direction #	Wind & – Fastest mile – Date	Percent of possible sunshine	Average sky cover sunrise to sunset	Number of days – Sunrise to sunset – Clear	Number of days – Sunrise to sunset – Partly cloudy	Number of days – Sunrise to sunset – Cloudy	Number of days – Precipitation .01 inch or more	Number of days – Snow, Ice pellets 1.0 inch or more	Number of days – Thunderstorms	Number of days – Heavy fog	Number of days – Temperatures – Maximum – 90° and above ‡	Number of days – Temperatures – Maximum – 32° and below	Number of days – Temperatures – Minimum – 32° and below	Number of days – Temperatures – Minimum – 0° and below	Average daily solar radiation - langleys
JAN	67.8	43.1	55.5	82	8	27	31+	288	0	0.74	0.63	14-15	0.0	0.0		66	43	34	63	15	3.2	8.1	26	E	4+	82	5.4	10	9	12	6	0	0	0	0	0	2	0	287
FEB	66.3	39.9	53.1	77	25	28	1	328	0	0.50	0.19	13	0.0	0.0		68	37	31	56	16	3.6	9.1	42	W	22	72	5.1	14	3	11	5	0	0	0	0	0	2	0	381
MAR	68.8	39.7	54.3	91	31	27	15	339	15	0.34	0.24	22	T	T	14	54	30	21	39	22	2.8	9.3	34	SW	13	86	3.2	19	7	5	3	0	0	0	1	0	3	0	511
APR	82.1	51.0	66.6	94	21	43	8	34	87	0.60	0.60	10-11	0.0	0.0		36	18	12	25	24	3.9	9.5	30	W	15+	97	2.3	22	4	4	2	0	2	0	1	0	0	0	651
MAY	90.4	59.3	74.9	103	30+	39	5	35	348	0.46	0.45	5	0.0	0.0		33	19	14	25	21	2.9	8.9	34	S	4	92	2.2	23	5	3	2	0	2	0	20	0	0	0	673
JUN	96.4	65.0	80.7	106	30	57	12+	0	477	0.00	0.00		0.0	0.0		35	17	12	24	23	5.1	9.8	35	SE	5	98	1.1	26	4	0	0	0	0	0	27	0	0	0	720
JUL	97.7	74.4	86.1	108	2	69	17+	0	658	1.51	0.64	16	0.0	0.0		63	38	33	54	19	3.4	9.1	40	NE	31	73	6.7	6	8	17	11	0	15	0	30	0	0	0	551
AUG	98.8	73.8	86.3	106	5	70	18	0	669	2.57	0.82	28-29	0.0	0.0		67	38	33	56	18	3.5	9.0	54	NE	7	84	4.8	12	14	5	11	0	16	0	31	0	0	0	552
SEP	93.7	68.7	81.2	101	9	61	23+	0	493	1.31	0.62	15	0.0	0.0		56	33	26	46	16	4.5	9.2	29	E	6	84	3.0	20	6	4	5	0	7	0	23	0	0	0	489
OCT	81.1	52.4	66.8	95	1	41	30	55	118	0.03	0.03	21	0.0	0.0		50	29	22	38	20	3.3	9.4	31	W	18	94	2.4	21	8	2	1	0	1	0	6	0	0	0	430
NOV	70.1	47.0	58.6	79	6+	34	18	188	1	1.06	0.45	9	0.0	0.0		53	38	36	55	13	6.1	10.3	34	E	28	82	4.8	11	8	11	6	0	1	1	0	0	0	0	301
DEC	65.1	39.7	52.4	81	15	24	31	384	0	0.82	0.60	3-4	T	T	27	70	45	37	63	15	3.0	7.9	34	W	5	84	4.6	15	5	11	5	0	1	1	0	0	4	0	263
YEAR	81.5	54.5	68.0	108	JUL. 2	24	DEC. 31	1651	2866	9.94	0.82	AUG. 28-29	T	T	DEC. 27 +	55	32	26	45	18	3.1	9.1	54	NE	AUG. 7	86	3.8	199	81	85	57	0	45	2	139	0	11	0	484

NORMALS, MEANS, AND EXTREMES

Month	Temperature – Normal – Daily maximum	Temperature – Normal – Daily minimum	Temperature – Normal – Monthly	Temperature – Extremes – Record highest	Temperature – Extremes – Year	Temperature – Extremes – Record lowest	Temperature – Extremes – Year	Normal heating degree days (Base 65°)	Precipitation – Normal total	Precipitation – Maximum monthly	Precipitation – Year	Precipitation – Minimum monthly	Precipitation – Year	Precipitation – Maximum in 24 hrs.	Precipitation – Year	Snow, Ice pellets – Mean total	Snow, Ice pellets – Maximum monthly	Snow, Ice pellets – Year	Snow, Ice pellets – Maximum in 24 hrs.	Snow, Ice pellets – Year	Relative humidity – Hour 05 (Local time)	Relative humidity – Hour 11 (Local time)	Relative humidity – Hour 17 (Local time)	Relative humidity – Hour 23 (Local time)	Wind & – Mean speed	Wind & – Prevailing direction	Wind & – Fastest mile – Speed	Wind & – Fastest mile – Direction #	Wind & – Fastest mile – Year	Pct. of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days – Sunrise to sunset – Clear	Mean number of days – Sunrise to sunset – Partly cloudy	Mean number of days – Sunrise to sunset – Cloudy	Mean number of days – Precipitation .01 inch or more	Mean number of days – Snow, Ice pellets 1.0 inch or more	Mean number of days – Thunderstorms	Mean number of days – Heavy fog	Mean number of days – Temperatures – Max. – 90° and above ‡	Mean number of days – Temperatures – Max. – 32° and below	Mean number of days – Temperatures – Min. – 32° and below	Mean number of days – Temperatures – Min. – 0° and below	Average daily solar radiation - langleys
(a)	(b)	(b)	(b)	29		29		(b)	(b)	29		29		29		29	29		28		29	29	29	29	24	15	22	22		22	28	29	29	29	29	29	29	29	29	29	29	29	13
J	62.6	37.0	49.8	87	1953	16	1949	471	0.82	2.37	1957	T	1958+	1.40	1946	0.3	4.7	1949	3.5	1949	63	40	33	57	7.8	SE	40	E	1962+	81	4.7	14	7	10	4	*	*	*	0	0	7	0	314
F	66.0	39.8	52.9	92	1957	20	1955+	344	0.84	2.27	1941	0.01	1961	1.49	1942	0.3	3.9	1965	3.9	1965	59	34	27	50	7.8	SE	59	E	1952	83	4.4	13	6	9	4	*	*	*	*	0	5	0	386
M	72.2	43.8	58.0	92	1950	20	1965	242	0.53	2.26	1952	0.00	1956	1.19	1952	0.3	5.7	1964	5.7	1964	52	28	22	42	8.3	SE	41	SE	1955	85	4.6	14	7	10	4	*	*	*	*	0	1	0	508
A	81.1	50.6	65.9	102	1943	27	1945	75	0.27	1.66	1951	0.00	1960+	0.75	1952	T	1.0	1956	1.0	1956	42	21	16	31	8.7	SE	46	SE	1952	91	3.5	17	7	6	2	*	1	0	5	0	*	0	641
M	89.4	57.5	73.5	107	1958+	38	1950	6	0.13	0.89	1943	0.00	1964+	0.89	1943	0.0	0.0		0.0		33	16	12	23	8.4	SE	42	NE	1965	93	2.8	20	7	4	1	0	1	0	18	0	0	0	703
J	98.2	67.1	82.7	111	1957	47	1955	0	0.29	1.46	1954	0.00	1969+	1.27	1954	0.0	0.0		0.0		33	17	13	24	8.4	SSE	50	SE	1961	93	2.2	22	6	2	1	0	2	0	28	0	0	0	702
J	98.5	74.1	86.3	111	1958	63	1960+	0	2.06	5.20	1958	0.27	1947	3.93	1958	0.0	0.0		0.0		57	33	28	47	8.2	SE	54	SE	1965+	76	5.3	9	13	9	11	0	14	0	29	0	0	0	600
A	94.7	71.5	83.1	109	1944	61	1956	0	2.88	7.93	1955	0.46	1953	2.48	1961	0.0	0.0		0.0		67	39	34	55	7.6	SE	54	NE	1969+	80	4.7	12	12	7	9	0	14	0	28	0	0	0	579
S	93.3	67.4	80.4	107	1950+	44	1965	0	1.00	5.11	1964	0.00	1953	3.05	1964	0.0	0.0		0.0		54	31	26	43	8.0	SE	54	SE	1960	87	2.8	20	6	4	4	0	5	0	24	0	0	0	531
O	83.2	56.8	70.0	101	1955	35	1949	25	0.64	2.62	1957	0.00	1952	1.86	1951	T	T	1959	T	1959	51	29	24	42	8.1	SE	47	SE	1948	90	2.7	20	7	4	3	0	2	0	10	0	0	0	442
N	71.9	44.2	58.1	90	1947	24	1958	231	0.62	1.90	1952	0.00	1954+	1.86	1968	0.2	6.4	1958	6.4	1958	54	31	28	48	8.0	SE	55	E	1951	85	3.5	17	7	6	3	*	*	*	*	0	1	0	340
D	64.9	38.9	51.9	84	1954	18	1954	406	0.92	5.02	1965	0.00	1958	1.54	1967	0.2	1.6	1967	1.6	1967	61	39	35	56	7.8	SE	44	W	1949	81	4.4	15	6	10	4	*	*	*	0	0	5	0	281
YR	81.3	54.1	67.7	111	JUL. 1958+	16	JAN. 1949	1800	11.00	7.93	AUG. 1955	0.00	JUN. 1969+	3.93	JUL. 1958	1.3	6.4	NOV. 1958	6.4	NOV. 1958	52	30	25	43	8.1	SE	59	E	FEB. 1952	86	3.8	193	91	81	50	1	40	1	142	0	21	0	502

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows:
Highest temperature 112 in June 1902; lowest temperature 6 in January 1913.

(a) Length of record, years, based on January data. Other months may be for more or fewer years if there have been breaks in the record.
(b) Climatological standard normals (1931-1960).
* Less than one half.
\+ Also on earlier dates, months, or years.
T Trace, an amount too small to measure.
Below zero temperatures are preceded by a minus sign.
The prevailing direction for wind in the Normals, Means, and Extremes table is from records through 1963.
‡ ≥ 70° at Alaskan stations.

Unless otherwise indicated, dimensional units used in this bulletin are: temperature in degrees F.; precipitation, including snowfall, in inches; wind movement in miles per hour; and relative humidity in percent. Heating degree day totals are the sums of negative departures of average daily temperatures from 65° F. Cooling degree day totals are the sums of positive departures of average daily temperatures from 65° F. Sleet was included in snowfall totals beginning with July 1948. The term "Ice pellets" includes solid grains of ice (sleet) and particles consisting of snow pellets encased in a thin layer of ice. Heavy fog reduces visibility to 1/4 mile or less.

Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover. The number of clear days is based on average cloudiness 0-3, partly cloudy days 4-7, and cloudy days 8-10 tenths.

Solar radiation data are the averages of direct and diffuse radiation on a horizontal surface. The langley denotes one gram calorie per square centimeter.

& Figures instead of letters in a direction column indicate direction in tens of degrees from true North; i.e., 09 - East, 18 - South, 27 - West, 36 - North, and 00 - Calm. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. If figures appear in the direction column under "Fastest mile" the corresponding speeds are fastest observed 1-minute values.

\# To 8 compass points only.

AVERAGE TEMPERATURE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1931	49.8	53.6	57.8	67.2	73.4	81.5	88.6	82.2	80.5	68.8	54.0	48.4	67.2
1932	43.3	54.6	57.4	63.5	71.7	79.6	85.5	85.2	80.6	67.5	60.0	47.2	66.4
1933	47.7	47.5	57.8	60.6	67.1	82.4	87.4	85.8	81.6	72.0	59.4	52.2	66.8
1934	49.4	56.4	63.9	69.0	78.4	79.8	87.5	83.6	79.6	70.6	56.7	52.3	69.0
1935	52.1	55.0	55.0	64.7	67.6	82.0	85.7	82.3	78.3	68.8	54.6	51.5	66.5
1936	48.5	53.2	59.0	66.9	75.3	83.8	86.8	83.8	77.6	68.6	59.9	50.8	67.9
1937	41.2	52.8	56.0	62.8	73.8	81.2	86.3	86.0	81.8	71.0	59.4	54.3	67.2
1938	52.4	54.2	57.6	65.5	71.3	81.8	84.4	83.3	81.2	70.0	54.8	53.0	67.5
1939	50.4	45.5	59.2	67.2	74.0	82.6	87.2	84.6	79.4	67.5	62.2	56.2	68.0
#1940	52.6	52.8	59.6	65.4	76.0	83.4	87.2	84.4	80.8	70.7	56.8	56.5	68.9
1941	52.6	56.5	56.9	59.8	72.9	80.2	85.4	83.2	79.4	67.2	60.6	52.0	67.3
1942	53.0	50.8	55.8	63.6	73.1	82.9	89.5	85.2	81.6	69.4	63.2	54.2	68.5
1943	52.8	58.7	61.8	70.4	76.3	83.2	88.0	83.9	82.0	70.8	61.6	52.5	70.2
1944	50.4	50.7	55.4	63.0	73.4	80.6	87.4	86.4	79.6	72.8	55.9	52.3	67.4
1945	50.7	53.6	54.6	63.4	73.6	78.9	86.5	84.2	80.9	71.6	58.5	50.4	67.2
1946	48.0	52.0	59.4	70.6	73.0	85.4	86.0	84.0	80.9	65.9	54.8	55.6	68.0
1947	48.4	57.8	59.6	64.8	76.8	82.1	88.2	83.7	83.0	70.4	54.2	48.2	68.1
#1948	51.5	50.8	54.0	68.0	75.1	83.4	86.8	85.2	82.6	71.1	53.6	51.2	67.8
1949	43.0	50.2	57.6	67.4	73.4	83.0	85.0	84.2	82.2	66.4	64.3	50.8	67.3
1950	50.4	57.2	60.7	69.2	71.6	81.6	82.8	84.7	78.3	76.8	63.0	56.9	69.4
1951	50.3	53.7	57.4	64.4	74.0	80.5	88.8	84.9	83.2	72.5	58.5	51.5	68.3
1952	51.7	51.6	52.7	65.1	76.8	83.4	86.0	85.3	83.3	76.4	56.4	50.1	68.2
1953	53.9	52.2	60.6	65.2	68.9	84.1	86.9	86.4	82.9	71.0	61.6	48.6	68.5
1954	53.5	60.3	59.3	71.5	75.9	83.1	56.8	83.4	82.9	74.2	62.7	53.3	70.6
1955	46.7	48.8	59.6	64.4	71.8	82.3	84.6	81.8	81.2	74.3	58.5	55.5	67.4
1956	56.1	48.7	60.2	64.2	75.8	86.2	85.4	84.0	84.3	70.2	57.8	52.5	68.8
1957	53.8	61.1	59.6	66.2	71.2	85.3	88.1	84.2	81.3	67.9	54.3	54.9	69.0
#1958	51.4	55.8	54.2	64.5	79.1	84.9	86.9	84.5	80.5	71.9	57.8	55.6	68.9
1959	53.8	51.5	58.2	69.2	72.5	85.4	86.6	81.8	80.2	69.7	58.5	51.4	68.2
1960	46.8	47.8	61.0	65.7	71.9	83.5	85.0	84.2	81.2	67.3	59.2	49.1	67.0
1961	52.5	53.0	58.2	66.2	72.9	84.7	86.1	81.8	77.1	68.5	54.4	50.5	67.1
1962	49.0	54.7	53.3	70.1	71.7	80.3	84.9	87.0	81.3	70.6	61.5	54.0	68.2
1963	48.3	57.5	57.7	64.0	77.3	80.5	87.6	82.3	82.4	73.2	59.3	52.7	68.6
1964	47.5	47.7	54.8	63.2	73.2	82.0	86.2	81.6	76.3	72.1	55.2	52.4	66.0
1965	53.6	51.1	55.1	64.5	70.1	77.6	85.0	84.0	76.8	71.9	62.6	52.1	67.1
1966	47.7	47.8	60.1	66.8	76.1	82.8	85.3	82.9	78.3	68.1	61.1	52.4	67.4
1967	51.4	55.6	62.1	62.1	71.9	80.7	85.4	84.6	80.7	71.6	62.9	48.6	68.1
1968	52.4	59.1	58.7	63.2	73.3	83.5	84.9	81.3	80.7	71.7	58.3	50.6	68.1
1969	55.5	53.1	54.3	66.6	74.9	80.7	86.1	86.3	81.2	66.8	58.6	52.4	68.0
RECORD MEAN	50.3	53.0	57.7	64.6	72.6	81.9	86.0	84.0	80.0	69.5	58.2	51.3	67.4
MAX	64.5	67.5	73.1	80.9	89.6	98.6	99.2	96.7	94.3	85.3	73.4	65.4	82.4
MIN	36.0	38.5	42.3	48.2	55.5	64.9	72.8	71.2	65.7	53.7	43.0	37.1	52.4

TOTAL DEGREE DAYS

TUCSON, ARIZONA

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
1934-35	0	0	0	18	276	394	395	276	310	63	41	0	1773
1935-36	0	0	0	56	317	413	493	341	246	83	6	0	1955
1936-37	0	0	0	36	171	444	738	344	281	95	0	0	2109
1937-38	0	0	0	0	176	333	389	302	233	83	22	0	1538
1938-39	0	0	0	20	327	368	455	542	218	32	0	0	1962
1939-40	0	0	0	29	120	280	385	352	169	61	0	0	1396
1940-41	0	0	0	35	255	269	383	241	241	175	33	0	1633
1941-42	0	0	0	59	159	405	372	399	285	93	6	0	1778
1942-43	0	0	0	31	82	328	375	190	125	48	0	0	1179
1943-44	0	0	0	43	118	386	458	414	269	95	4	0	1787
1944-45	0	0	0	2	287	392	448	315	324	137	1	0	1906
1945-46	0	0	2	7	206	451	526	370	196	22	0	0	1780
1946-47	0	0	0	51	308	304	513	205	175	76	2	0	1634
1947-48	0	0	0	19	337	518	417	408	341	41	0	0	2081
#1948-49	0	0	0	23	344	428	683	414	230	64	0	0	2186
1949-50	0	0	0	78	56	442	445	216	154	22	21	0	1434
1950-51	0	0	0	0	72	242	448	321	230	81	25	0	1419
1951-52	0	0	0	18	187	413	404	386	383	69	0	0	1860
1952-53	0	0	0	0	275	456	339	352	161	64	38	0	1685
1953-54	0	0	0	30	152	499	352	127	179	5	6	0	1350
1954-55	0	0	0	13	91	364	560	445	175	74	13	0	1735
1955-56	0	0	0	0	198	288	268	468	167	84	0	0	1473
1956-57	0	0	0	47	223	378	340	128	167	50	18	0	1351
1957-58	0	0	0	41	314	306	416	252	329	100	0	0	1758
#1958-59	0	0	0	27	215	284	340	370	205	8	10	0	1459
1959-60	0	0	0	45	189	416	556	493	136	68	5	0	1908
1960-61	0	0	0	37	183	486	381	331	206	41	9	0	1674
1961-62	0	0	0	61	312	444	491	285	357	5	7	0	1962
1962-63	0	0	0	13	137	336	515	215	234	79	0	0	1529
1963-64	0	0	0	2	186	372	533	497	321	107	27	0	2045
1964-65	0	0	0	5	293	383	348	383	305	114	21	0	1852
1965-66	0	0	8	33	110	396	532	473	166	26	0	0	1744
1966-67	0	0	0	20	126	386	416	256	115	113	20	0	1452
1967-68	0	0	0	14	89	502	384	170	200	91	0	0	1450
1968-69	0	0	0	4	204	440	288	328	339	34	35	0	1672
1969-70	0	0	0	55	188	384							

TOTAL PRECIPITATION

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1931	0.68	2.95	0.16	0.48	1.34	0.49	1.07	3.96	0.94	0.05	3.72	0.42	16.26
1932	0.74	1.27	0.40	0.32	T	0.16	2.58	1.61	0.23	1.62	0.00	2.01	10.94
1933	0.93	0.24	0.00	0.03	0.00	0.10	1.60	2.23	1.62	2.00	0.47	0.38	9.60
1934	0.50	0.30	0.39	0.03	0.05	0.14	1.16	2.41	1.07	T	0.50	2.04	8.59
1935	1.25	2.43	1.46	T	0.14	T	0.87	5.61	0.88	0.00	1.89	1.24	15.77
1936	0.96	0.92	0.55	0.07	T	0.05	2.82	3.03	1.51	0.34	1.13	0.85	12.24
1937	1.62	0.23	0.63	0.01	0.25	T	2.06	1.29	1.43	0.05	0.19	0.67	8.43
1938	0.65	0.88	0.43	0.08	0.11	2.07	0.78	2.37	0.50	0.00	0.09	0.93	8.89
1939	0.35	1.60	0.69	0.04	0.00	T	0.61	1.24	1.53	0.18	0.54	0.27	7.05
#1940	0.45	1.42	0.04	0.21	0.52	1.19	0.68	3.51	1.89	0.17	1.75	3.07	14.90
1941	1.43	2.27	1.46	1.06	0.74	T	2.51	1.99	1.20	0.53	0.65	2.01	15.85
1942	0.50	1.92	0.23	0.79	0.00	0.00	0.68	0.90	1.78	0.60	T	0.47	7.87
1943	0.44	0.39	1.27	0.03	0.89	0.13	1.09	3.04	3.59	0.25	0.00	0.79	11.91
1944	0.36	1.10	1.01	0.56	0.37	0.04	1.77	1.78	2.08	1.13	1.78	1.55	13.53
1945	0.58	0.47	0.53	0.11	0.00	0.00	2.84	4.31	0.14	1.13	0.00	0.47	10.58
1946	2.22	0.22	0.50	0.14	0.00	0.04	2.44	3.61	2.26	0.82	1.10	0.46	13.81
1947	0.14	0.02	0.39	T	0.04	0.05	0.27	2.24	0.47	0.80	0.70	0.41	5.53
#1948	T	2.00	0.29	T	0.00	0.06	3.02	1.08	1.11	0.56	0.06	0.93	9.11
1949	1.19	0.20	0.19	0.38	0.00	0.02	1.42	1.92	0.81	0.52	0.17	0.84	7.66
1950	0.30	1.48	0.26	T	0.01	1.24	3.72	0.86	1.15	T	T	0.27	9.29
1951	1.12	0.13	0.12	1.66	0.01	T	1.49	2.66	0.34	1.91	1.27	0.99	11.70
1952	0.24	0.08	2.26	1.51	0.02	0.30	3.25	1.56	0.60	0.00	1.90	0.73	12.65
1953	0.06	0.96	0.60	0.05	T	0.03	2.87	0.46	0.00	T	0.18	0.12	5.34
1954	0.78	0.75	1.01	0.00	0.47	1.46	2.03	2.00	3.05	0.02	0.00	0.06	11.63
1955	1.89	0.19	0.03	T	0.03	0.03	5.10	7.93	0.05	0.32	T	0.33	15.90
1956	1.08	0.54	0.00	0.31	T	0.36	2.77	1.12	0.37	0.27	T	0.22	7.04
1957	2.37	0.36	0.93	0.16	0.33	0.17	1.25	3.92	T	2.62	0.56	0.89	13.56
#1958	T	1.15	1.82	0.48	0.02	0.51	5.20	0.91	0.21	1.21	1.09	0.00	12.60
1959	0.03	0.28	T	0.01	0.00	T	3.92	2.79	T	0.70	0.29	1.97	9.99
1960	2.01	0.42	0.25	0.00	0.08	0.25	0.73	2.09	1.20	0.71	0.07	0.93	8.74
1961	0.95	0.01	0.41	T	0.00	0.26	1.81	4.28	0.51	0.65	0.44	1.57	10.89
1962	1.39	0.33	0.25	T	0.00	0.25	1.38	0.48	2.86	0.22	0.49	0.93	8.58
1963	0.59	0.81	0.34	0.32	T	T	1.66	2.86	1.45	0.60	1.26	0.08	9.97
1964	0.14	0.13	0.81	0.67	0.00	0.01	4.82	3.90	5.11	0.91	0.68	0.81	17.99
1965	0.45	0.64	0.27	0.23	T	0.01	2.13	1.12	0.82	0.07	0.77	5.02	11.53
1966	1.74	2.25	0.19	0.12	0.11	0.02	2.57	3.31	3.53	0.32	0.06	0.19	14.41
1967	0.04	0.13	0.41	0.29	0.62	0.42	2.72	2.00	1.35	1.03	0.48	3.44	12.93
1968	0.18	0.99	1.79	0.62	T	0.00	1.97	1.12	T	0.09	1.85	0.32	8.94
1969	0.74	0.50	0.34	0.60	0.46	0.00	1.51	2.57	1.31	0.03	1.06	0.82	9.94
RECORD MEAN	0.82	0.84	0.70	0.37	0.19	0.26	2.21	2.19	1.24	0.54	0.79	1.05	11.20

TOTAL SNOWFALL

Season	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total

Record mean values above (not adjusted for instrument location changes listed in the Station Location table) are means for the period beginning in 1900.

# Indicates a break in the data sequence during the year, or season, due to a station move or relocation of instruments. See Station Location table. Temperature and precipitation are from the University of Arizona location through May 1940 and from Airport locations thereafter. Heating Degree Days from Airport locations for the entire period of the table.

STATION LOCATION

TUCSON, ARIZONA

Location	Occupied from	Occupied to	Airline distance and direction from previous location	Latitude North	Longitude West	Elevation above: Sea level									Sea level	Remarks
						Ground at temperature site	Ground: Wind instruments	Extreme thermometers	Psychrometer	Telepsychrometer	Tipping bucket rain gage	Weighing rain gage	8" rain gage	Hygrothermometer	Pyranometer	
COOPERATIVE																
University of Arizona	10-1891	Present		32° 14'	110° 57'	2391	a40	b5	b5				3		# 2440	a - 45 ft. to September, 1894. b - 11 ft. to September, 1894. # - Added June, 1946.
AIRPORT																
Tucson Municipal (Later Davis-Monthan Air Force Base)	1/22/30	10/14/48		32° 11'	110° 55'	2553	c33	g5	g5		f14	d14	e14			Army Signal Service to Nov. 1932. c - Installed 6/17/40 d - Installed 6/17/40 at 3 ft. and moved to roof 7/23/47. e - Unknown to 6/17/40, 5 ft. to 7/23/47. f - Installed 10/1/47. g - Unknown prior to 6/17/40.
Tucson Municipal	10/14/48	10/15/58	4.9 mi.SW	32° 08'	110° 57'	2558	33	5	5	4	5		5			New Airport
Tucson Municipal ††	10/15/58	Present	4500 ft. E	32° 07'	110° 56'	2584	20	5	5	5	3		4			†† Tucson International Airport effective 3/13/63.

Requests for additional information should be directed to the Weather Bureau Office for which this summary was issued.

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8

FINAL REPORT

ON THE

SITE SELECTION SURVEY

FOR THE

NATIONAL ASTRONOMICAL OBSERVATORY

March 1, 1958

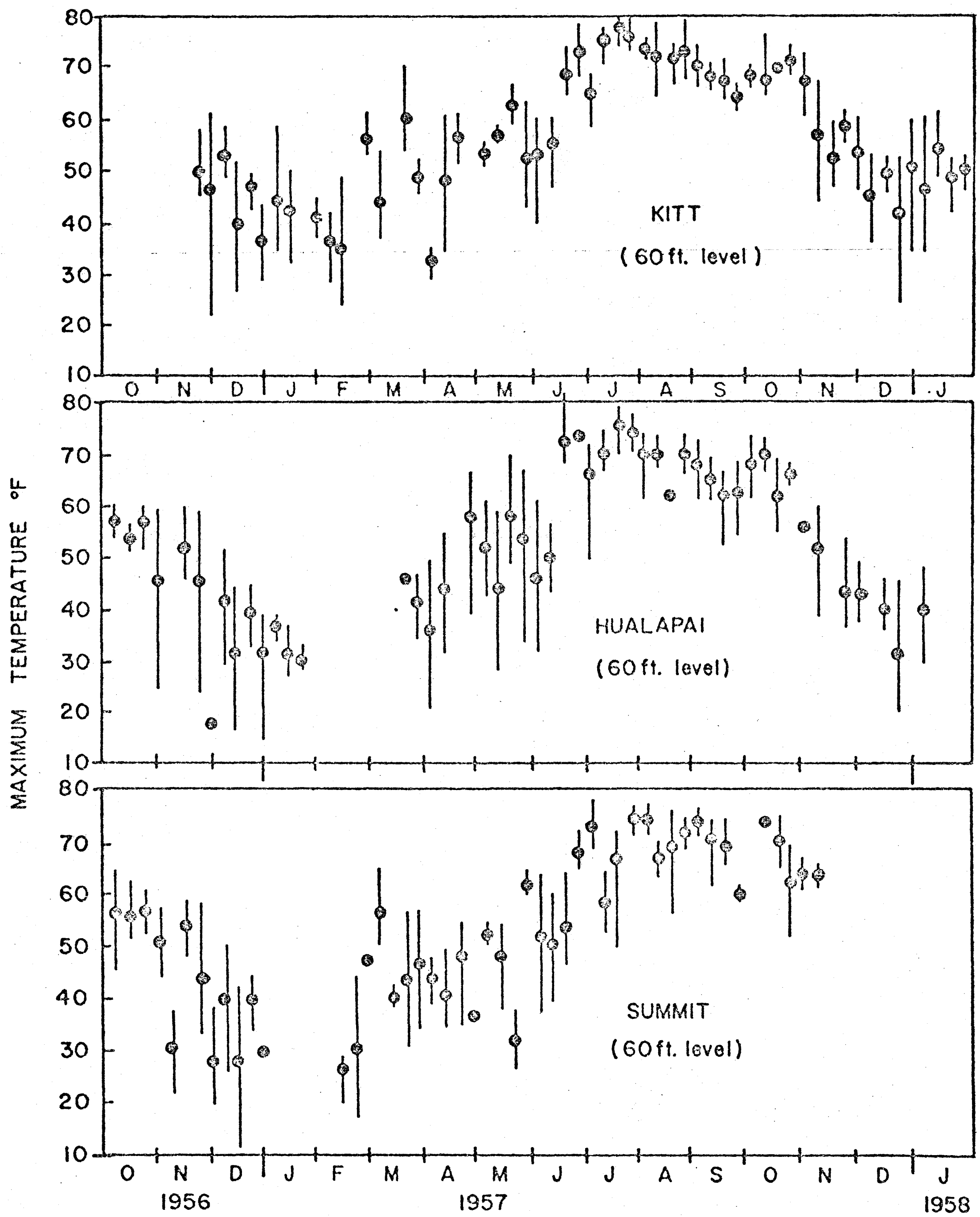
A. B. Meinel

The research reported in this document was performed under grants from the National Science Foundation to the University of Michigan during the three years of 1955, 1956 and 1957, and under a contract with the Association of Universities for Research in Astronomy, Inc. in 1958.

This new edition was prepared by Helmut A. Abt and Eleanor S. Biggs; new drawings were made by DeWayne Graham and Hugh Ferguson.

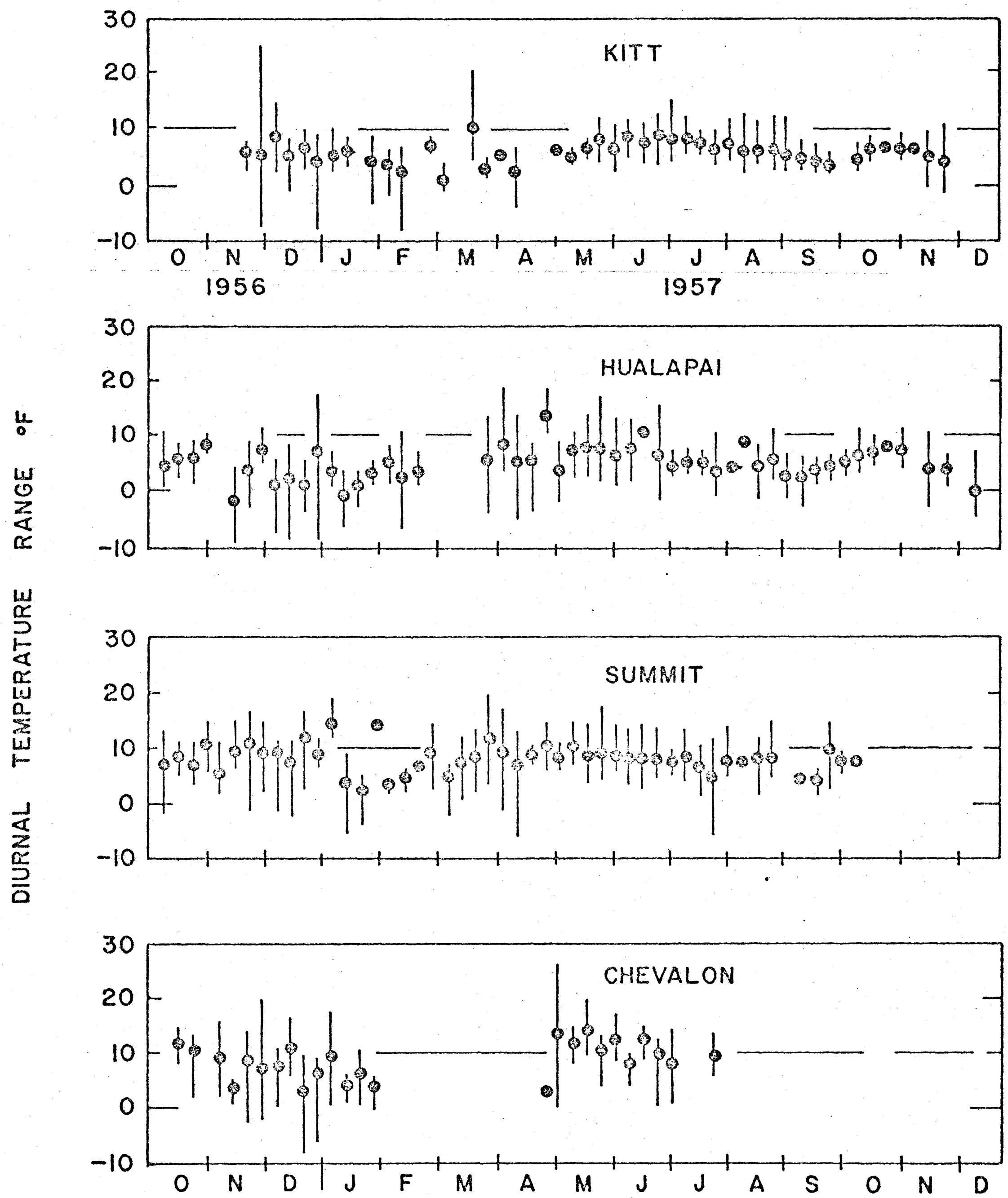
Contributions from the Kitt Peak National Observatory, No. 45.

October 1963



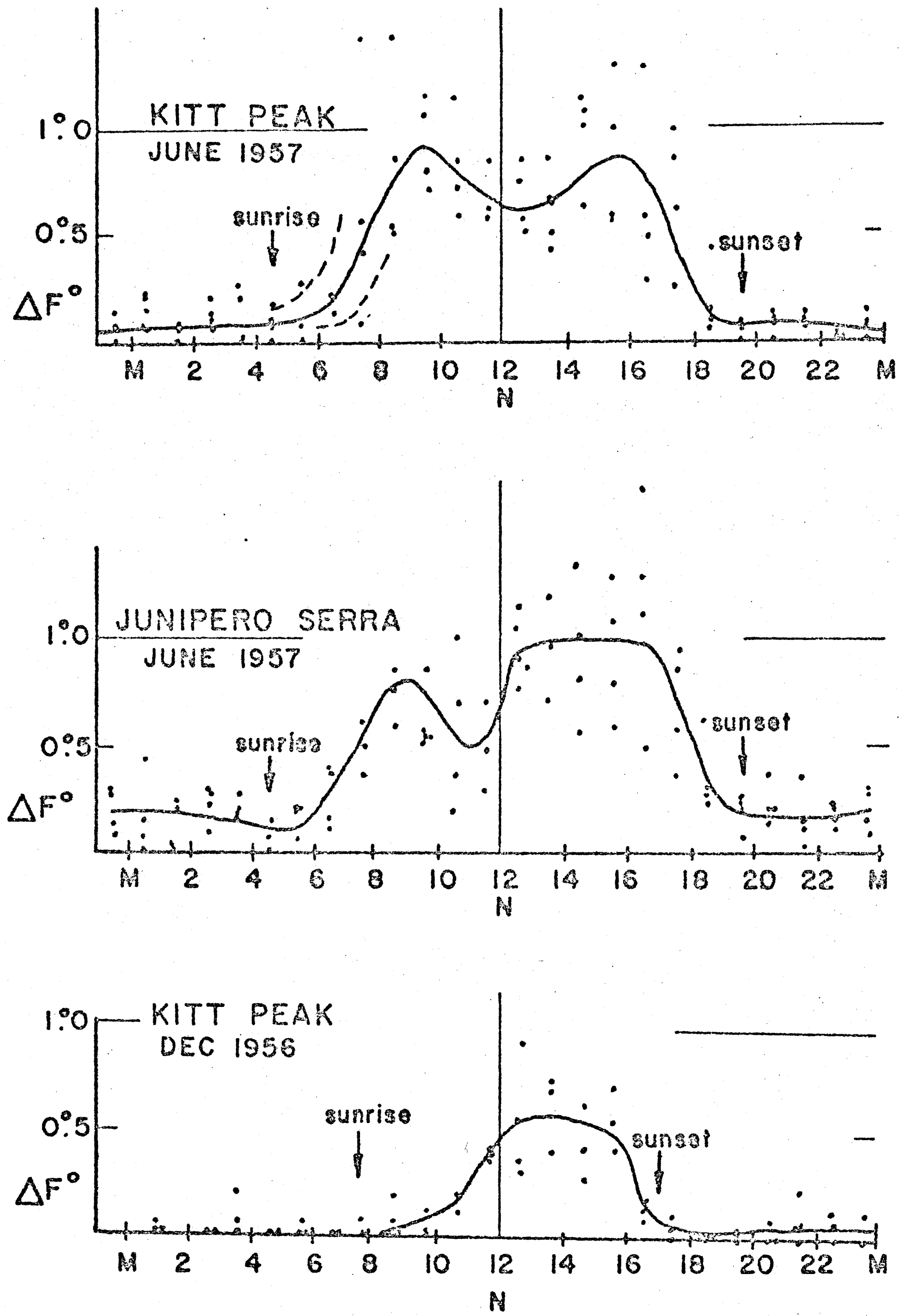
WEEKLY AVERAGE TEMPERATURE & DAILY-AVERAGE RANGE

FIG. 23



WEEKLY AVERAGE & DAILY TEMPERATURE RANGE

FIG. 24



DIURNAL MICROTHERMAL FLUCTUATIONS

$T_{max} - T_{min}$ (°F) for 3^m intervals

60 ft. above ground

FIG. 25

JULY 1970

KITT PEAK

THE CALIFORNIA SITE SURVEY*

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Received March 5, 1970

This paper summarizes the results of a two-year survey of potential dark-sky observing sites in California south of the latitude of San Francisco. This survey was undertaken in 1965 to locate a new site for future large optical telescopes since the growth of lights and smog near Mount Hamilton are increasingly limiting the usefulness of that site for observations of very faint objects and for photometry.

The best observing conditions appear to occur along the coast, very close to the ocean where the cold ocean current holds down the height of the inversion layer, and where there exists a laminar airflow off the ocean, minimizing the optical turbulence and placing the site upwind from sources of smog.

I. Introduction

In describing Mount Hamilton in 1879, S. W. Burnham (1887) wrote: "There can be no doubt that Mount Hamilton offers advantages superior to those found at any point where a permanent observatory has been established." In recent years, however, the quality of the observing conditions at Mount Hamilton has begun to deteriorate due to the increase in lights and smog in the San Francisco Bay area, and, in particular, in the Santa Clara valley. By the early 1960's it had become clear that while certain types of work, such as high-dispersion spectroscopy, could continue indefinitely at Mount Hamilton, a new site would have to be found for observations of very faint objects and for photometry. In 1965, the Regents of the University of California authorized the Lick Observatory to conduct a two-year survey of possible dark-sky sites for future optical telescopes. At the request of the Observatory Director, Dr. A. E. Whitford, I undertook the supervision of this survey.

The characteristics that a new site should possess include:

1. Dark sky.
2. High transparency.
3. High percentage of clear weather.
4. Minimum optical turbulence.

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*Contributions from the Lick Observatory, No. 314.

TABLE I

WEATHER OBSERVATIONS AT JUNIPERO SERRA PEAK

	Temperature, °F Maximum Highest	Temperature, °F Maximum Average	Temperature, °F Minimum Lowest	Temperature, °F Minimum Average	Average Δ Temp. During Night °F	Relative Humidity, % During Night Highest	Relative Humidity, % During Night Lowest	Relative Humidity, % During Night Average	Total Precipitation, Inches Rain	Total Precipitation, Inches Snow*
1965										
Aug	77	72.7	58	60.6	3.8	33	0	20.1	0.00	0.0
Sep	72	60.0	37	51.9	3.6	100	12	64.7	0.00	0.0
Oct	84	69.3	31	54.8	3.3	95	2	29.9	0.02	0.0
Nov	64	48.6	24	39.0	2.1	97	15	65.9	13.35	4.0
Dec	64	39.9	16	31.0	3.4	97	10	57.4	3.63	11.6
1966										
Jan	50	39.6	22	31.5	3.6	100	2	51.4	0.63	12.6
Feb	54	38.6	19	29.6	3.4	98	0	55.4	1.69	0.9
Mar	74	50.8	13	38.4	3.3	98	0	43.7	0.06	7.5
Apr	76	60.0	29	44.4	2.9	100	4	43.4	0.40	0.0
May	76	63.6	35	47.5	2.7	100	11	43.9	0.00	0.0
Jun	85	69.5	39	54.4	2.4	100	2	37.1	0.10	0.0
Jul	84	73.3	44	57.2	2.6	90	13	38.8	0.80	0.0
Aug	86	78.7	43	62.5	2.7	95	8	33.0	0.01	0.0
Sep	81	68.0	39	52.7	3.4	98	12	44.2	0.16	0.0
Oct	76	63.4	32	49.5	3.9	92	10	36.8	0.00	0.0
Nov	71	47.4	24	38.0	3.8	100	14	61.0	6.66	1.0
Dec	62	45.6	19	36.0	3.5	97	2	45.3	15.79	Trace
1967										
Jan	61	45.2	19	36.4	4.2	99	11	47.9	8.78	10.0
Feb	63	49.6	20	38.0	5.4	100	4	35.8	0.00	6.1
Mar	59	41.2	17	30.1	3.2	100	2	69.4	6.31	34.1
Apr	42	32.3	17	24.4	3.0	100	14	86.7	0.00	68.0
May	81	57.3	28	44.5	2.8	98	8	49.9	0.69	0.0
Jun	84	64.8	31	51.4	2.2	96	6	46.1	0.15	0.5
Jul	84	78.9	58	63.9	3.0	77	11	33.9	0.14	0.0
Aug	86	81.5	63	67.6	1.6	50	15	33.8	0.00	0.0
Sep	78	70.3	47	56.8	3.0	96	23	50.8	1.83	0.0
Oct	72	64.0	38	51.5	3.4	98	5	37.5	0.64	0.0

*Includes sleet and hail

has been a well-known feature over the years and has been one of the great advantages of that site, since the effect of thermal change on the instruments is minimized. This temperature pattern is presumably related to the fact that near the coast the height of the inversion layer is low so that Junipero Serra Peak and Mount Hamilton are above it. In addition to the diurnal changes, Figure 3 also illustrates the slow variations in temperature with amplitudes of five or ten degrees and periods of the order of ten days observed at all three sites. Note that the variation of temperature during the night at

y, %	Total Precipitation, Inches	
verage	Rain	Snow*
0.1	0.00	0.0
4.7	0.00	0.0
9.9	0.02	0.0
5.9	13.35	4.0
7.4	3.63	11.6
1.4	0.63	12.6
5.4	1.69	0.9
3.7	0.06	7.5
3.4	0.40	0.0
3.9	0.00	0.0
7.1	0.10	0.0
8.8	0.80	0.0
3.0	0.01	0.0
4.2	0.16	0.0
6.8	0.00	0.0
1.0	6.66	1.0
5.3	15.79	Trace
47	3.78	10.0
35	0.00	6.1
59.4	6.31	34.1
86.7	0.00	68.0
49.9	0.69	0.0
46.1	0.15	0.5
33.9	0.14	0.0
33.8	0.00	0.0
50.8	1.83	0.0
37.5	0.64	0.0

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TABLE II

WEATHER OBSERVATIONS AT PIPER MOUNTAIN

	Temperature, °F Maximum Highest	Maximum Average	Minimum Lowest	Minimum Average	Average Δ Temp. During Night °F	Relative Humidity, % During Night Highest	Lowest	Average	Total Precipitation, Inches Rain	Snow
1966										
Mar	70	49.3	18	38.7	4.4	50	2	17.1	0.00	0.0
Apr	67	54.7	21	40.7	6.7	60	2	16.6	0.00	Trace
May	74	64.1	35	50.9	4.8	78	1	19.8	0.19	0.0
Jun	80	69.1	43	57.4	5.3	42	2	15.1	0.03	0.0
Jul	84	76.0	50	61.9	5.7	94	1	17.3	0.02	0.0
Aug	86	76.6	48	62.0	4.6	50	0	20.1	0.03	0.0
Sep	76	68.1	36	54.3	5.7	94	6	26.1	0.45	0.0
Oct*	66	62.0	41	47.0	7.9	54	17	34.0	0.00	0.0

*Observations from Oct. 1-9 only

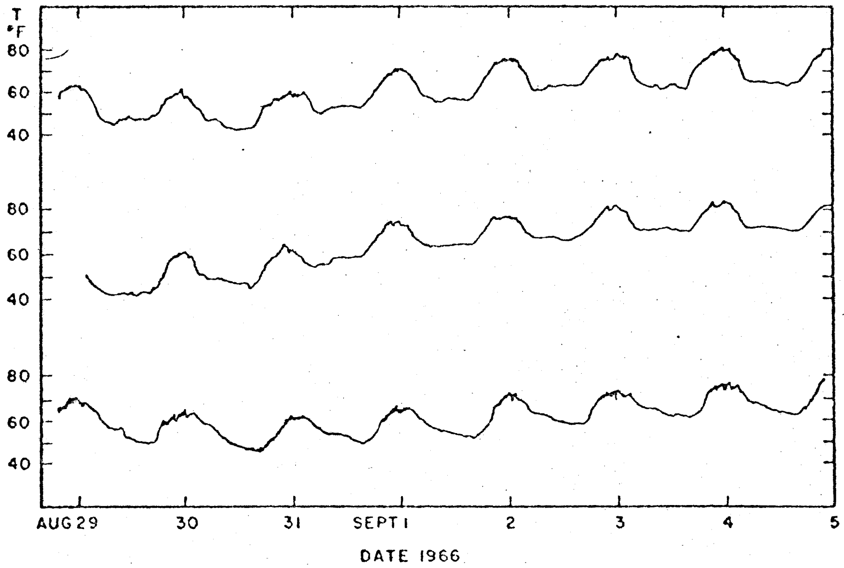

FIG. 3 — Simultaneous thermograph records obtained at (top to bottom): Junipero Serra Peak, Mount Hamilton, and Piper Mountain.

Chile Site Survey
Technical Report No. 2

ASTRONOMICAL OBSERVING CONDITIONS IN NORTH-CENTRAL CHILE

By

Jurgen Stock

May, 1963
Kitt Peak National Observatory
Tucson, Arizona

TABLE VIII

TEMPERATURE DATA FOR TOLOLO AND LA PEINETA

Tololo

		Maximum Temperature, °F			Minimum Temperature, °F			Average During Clear Nights	
		High	Low	Aver.	High	Low	Aver.	Max.	Min.
)	August	71	44	61	56	26	46		
	September	73	36	62	59	18	46		
	October	73	34	63	58	32	47		
	November	76	62	70	62	48	54		
	December	73	66	71	66	47	56		
L	January	79	65	71	64	46	55		
	February	75	65	72	61	49	56		
	March	77	47	70	63	42	55	70	56
	April	71	58	65	57	43	51	64	52
	May	71	40	61	57	33	49	66	53
	June	69	25	45	55	18	36	51	41
	July	67	28	52	56	23	43	57	47
	August	69	28	54	60	23	42	58	46
	September	67	31	48	56	21	37	50	39
	October	67	34	57	54	24	44	61	47
	November	70	51	60	56	35	45	62	46
	December	67	56	62	56	40	47	62	49
2	January	68	53	62	54	37	48	62	48
	February	68	58	63	53	42	49	63	49
	March	69	51	61	55	35	48	61	48
	April	67	43	58	54	30	46	59	48
	May	65	29	53	52	26	42	56	44
	June	60	30	45	53	22	35	49	39
	July	60	32	48	53	23	38	50	39
	August	64	22	51	53	16	39	56	44
	September	62	33	50	46	22	32	52	38
	October	62	32	52	53	22	40		
	November	69	49	58	53	33	45		
	December	63	53	59	52	39	46		

TABLE VIII (contd.)

TEMPERATURE DATA FOR TOLOLO AND LA PEINETA

La Peineta

	Maximum Temperature, °F			Minimum Temperature, °F			Average During Clear Nights	
	High	Low	Aver.	High	Low	Aver.	Max.	Min.
January	65	53	58	51	38	42	58	42
February	65	56	61	50	42	46	61	46
March	65	55	60	49	40	44	60	44
April	67	44	58	50	33	44	59	44
May	63	42	54	49	26	40	56	40
June	60	39	49	46	26	36	50	36
July	59	32	48	46	20	35	48	36
August	60	35	54	46	22	40	54	40
September	62	43	54	46	30	38		
October	64	36	53	48	24	38		
November	64	51	58	47	35	42		
December	61	55	55	48	32	40		

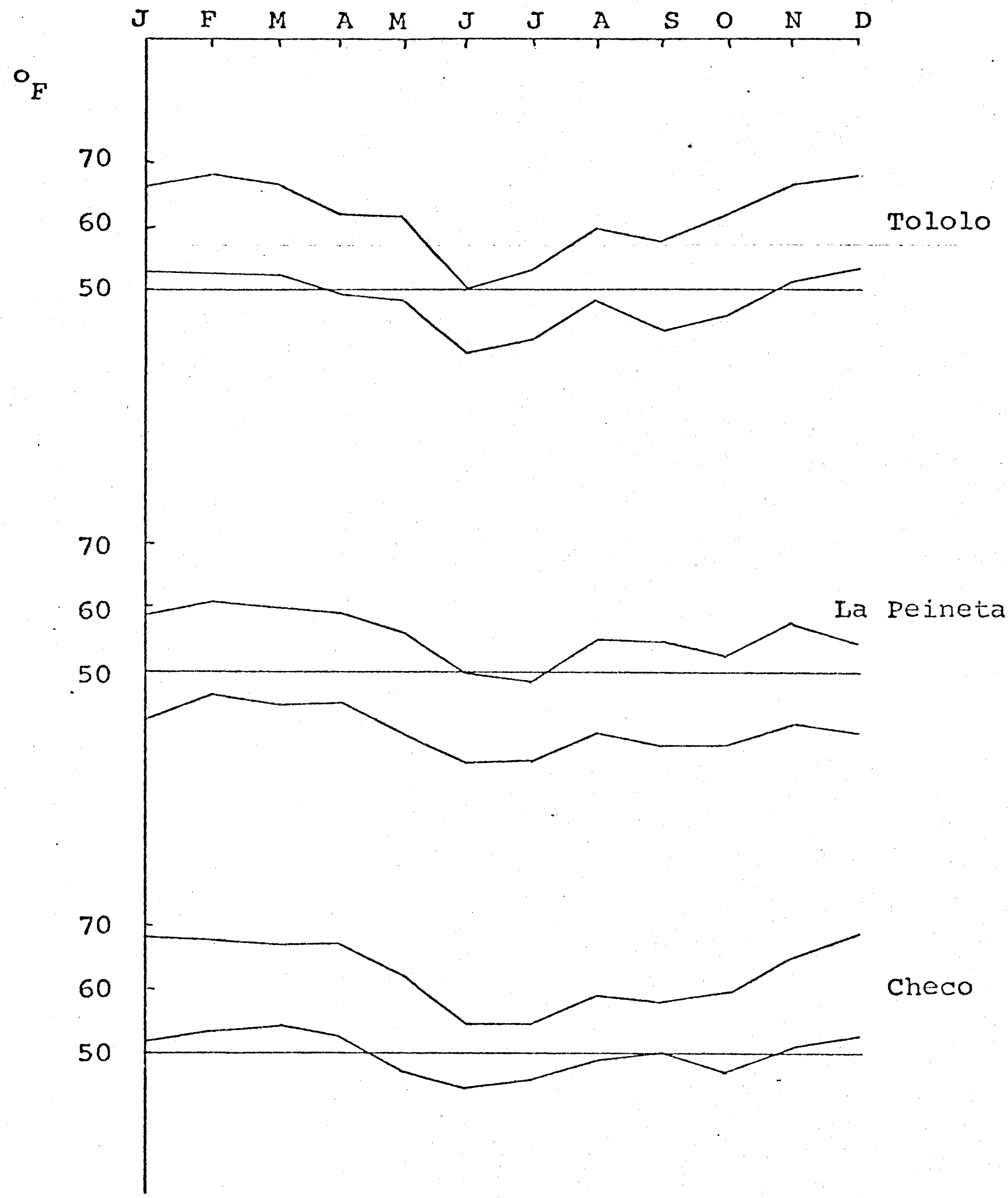

Figure 22. Average maximum and minimum temperatures during clear-weather periods for three sites.

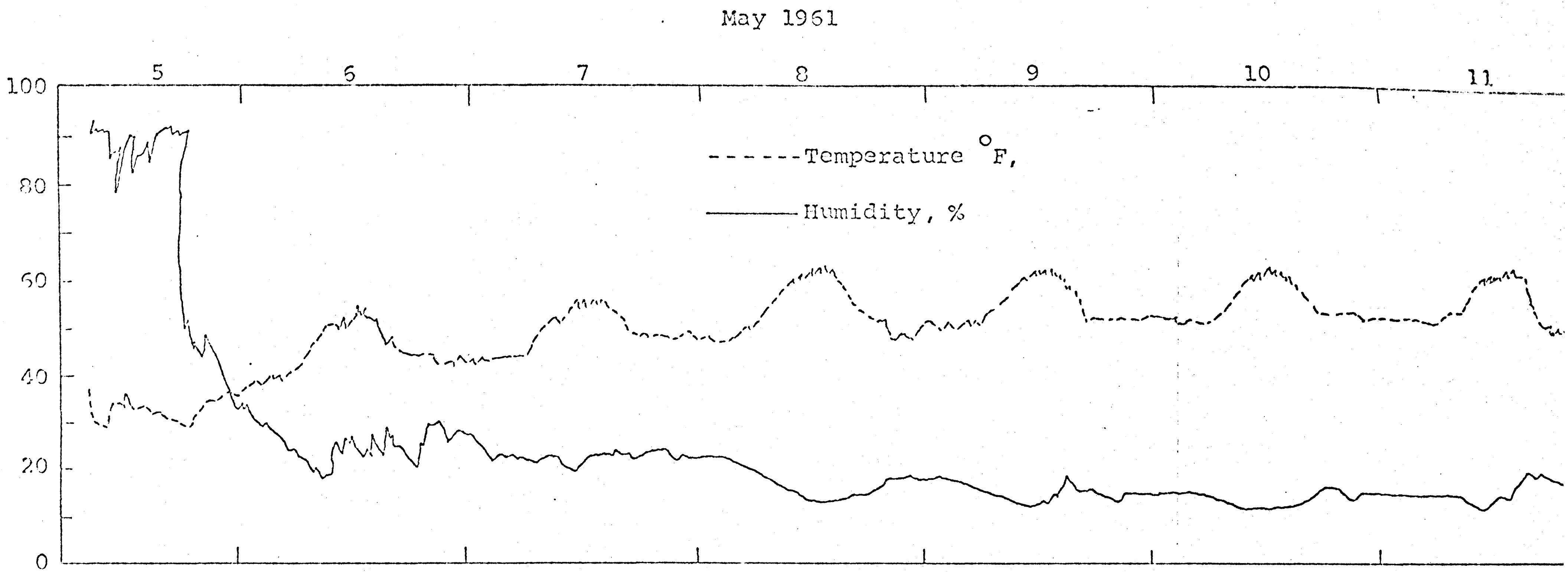

Figure 23. Typical winter thermo-hygrograph record from Tololo.

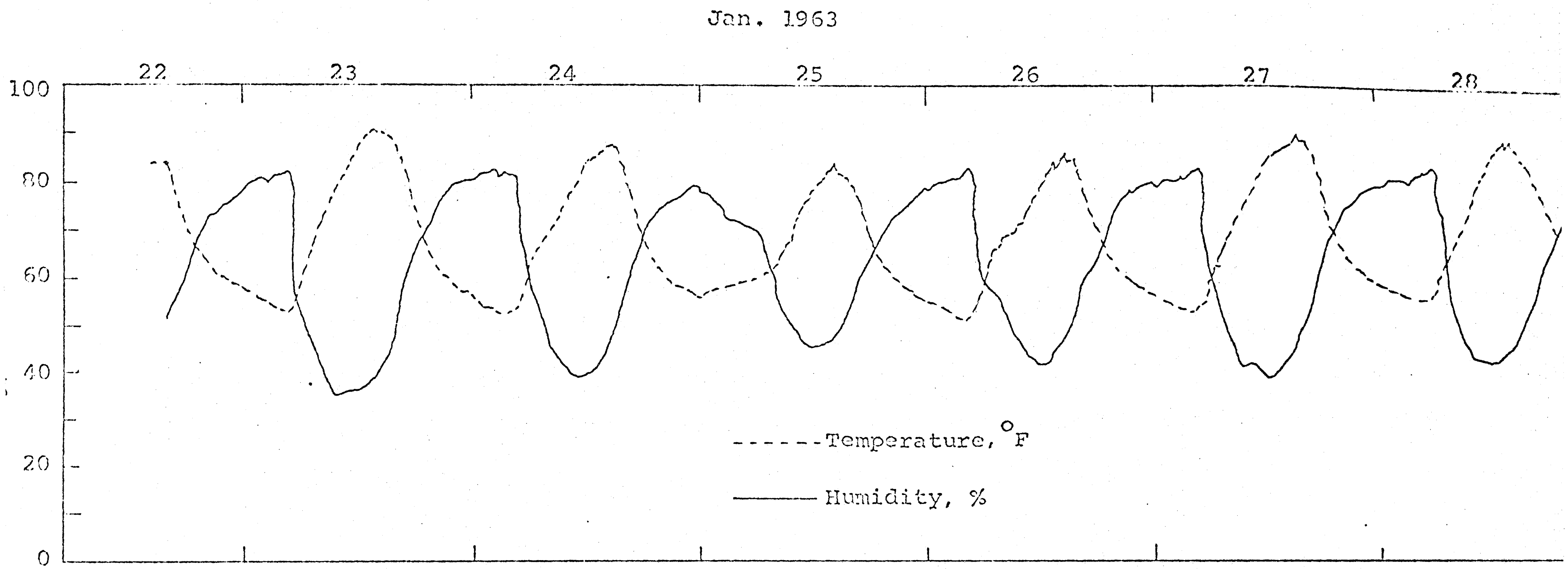

Figure 24. Typical thermo-hygrograph record from Copiapó

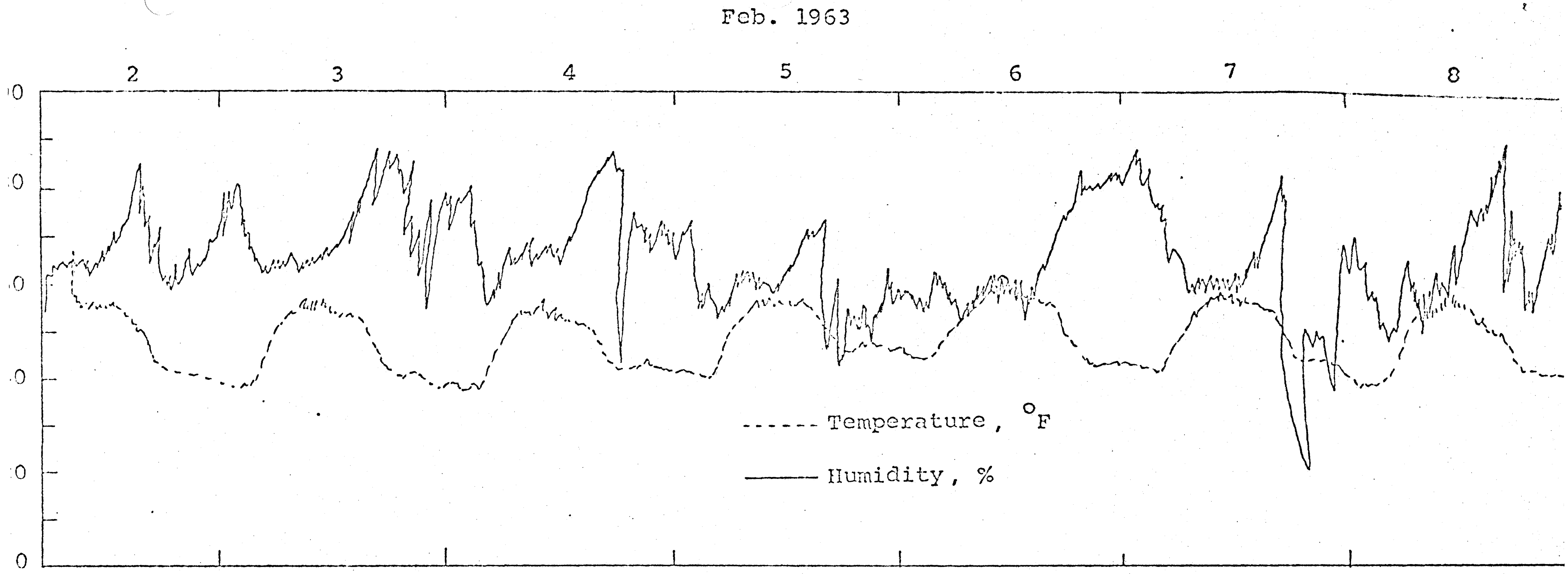

Figure 25. Typical summer thermo-hygrograph record from La Peineta.