Methods to Compute Long-Wave Radiation From the Atmosphere and Reflected Solar Radiation From a Water Surface

By GORDON E. KOBERG

STUDIES OF EVAPORATION

GEOLOGICAL SURVEY PROFESSIONAL PAPER 272-F

Methods to compute long-wave radiation from the atmosphere and reflected solar radiation from meteorological data without the necessity of direct measurement

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1964

UNITED STATES DEPARTMENT OF THE INTERIOR

STEWART L. UDALL, *Secretary*

GEOLOGICAL SURVEY

Thomas B. Nolan, *Director*

CONTENTS

	Page		Page
Abstract.....	107	Solar radiation reflected from water surface.....	110
Radiation measurements.....	107	References cited.....	112
Long-wave radiation relationships.....	108		

ILLUSTRATIONS

	Page
FIGURE 33. Radiation station showing pyrhelimeter, flat-plate radiometer, and psychrometer.....	108
34. Curves showing the value of the c constant in Brunt's equation.....	109
35. Clear-sky solar-radiation chart.....	111
36. Relationship to determine reflected solar radiation from measured solar radiation.....	111

TABLES

	Page
TABLE 1. Computations of computed infrared radiation by Brunt's relationship as modified and compared with measurements of infrared radiation.....	110
2. Infrared radiation from a black body for temperatures between 0° C and 39° C.....	110
3. Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities.....	115

STUDIES OF EVAPORATION

METHODS TO COMPUTE LONG-WAVE RADIATION FROM THE ATMOSPHERE AND REFLECTED SOLAR RADIATION FROM A WATER SURFACE

By GORDON E. KOBERG

ABSTRACT

Methods are presented for computing long-wave radiation from the atmosphere and reflected solar radiation from a water surface. The parameters needed to compute the long-wave radiation are air temperature, air-vapor pressure, and the ratio of measured solar radiation to clear-sky solar radiation. The long-wave determination is based on Brunt's equation in which the atmosphere is treated as a gray body. Computations by this method were made at 11 stations for periods of a week or longer and compared to long-wave radiation measurements made with a flat-plate radiometer. The average difference, without regard to sign, between the computed and the measured long-wave radiation was 5.2 percent or less for 9 of the 11 stations. The method for determining reflected solar radiation requires only a measurement of solar radiation and will be accurate within 10 percent.

Long-wave radiation from the atmosphere and reflected solar radiation from a water surface are important factors in the energy-budget equation for determining evaporation. In connection with its program of evaporation measurement, the U.S. Geological Survey has obtained direct measurements of the received and reflected radiation for periods of from 1 to 2 years at a number of reservoirs. These reservoirs, all located in the arid West, lie in an area between lat 30° and 40° N and long 95° and 120° W. The moisture content of the atmosphere in this area ranges from low, in the dry desert regions, to high, in the areas near the Gulf of Mexico. Data have been obtained at locations ranging in altitude from near sea level to 10,000 feet.

The received and reflected radiation measurements have been used in a study of the relation of long-wave radiation to certain atmospheric characteristics such as temperature, vapor pressure, and cloud cover. Several authors have published studies of relations of this type, and results of the studies are frequently used in heat-budget studies in areas where direct-radiation measurements are not feasible.

RADIATION MEASUREMENTS

Early radiation measurements were made with the small 2- by 2-inch hemispherical radiometer (Dunkle and others, 1949), and later measurements were made with the larger Beckman-Whitley flat-plate radiometer. The latter instrument is a thin laminated plate sandwiched between two aluminum sheets. The exposed

surface of the upper sheet is painted black so that it will absorb all wave lengths, and the exposed surface of the lower sheet is left shiny to obtain a reflecting surface for all wave lengths. Inside the plate are two sets of thermopiles: one set near the upper surface and the other near the lower surface. To insure that the lower surface of the plate receives no radiation, a radiation shield is located half an inch below the plate. When this shield is in place, a blower must be used to insure that the thermal convective losses will be equal on both sides of the plate.

The receiving surface absorbs the incident radiation, some of which is reradiated. The part that is reradiated may be computed, by using Stefan's Law, from the temperature of the receiving surface, which is determined by a thermocouple imbedded in the plate. The remainder of the absorbed radiation is carried away by forced convection from the upper and lower surfaces of the plate. Because very little of the energy carried away from the lower surface by convection is received from the surroundings, the energy lost from the lower surface by convection must have flowed through the plate. The temperature gradient between the upper and lower surface is a measure of the radiation absorbed from the atmosphere and then lost by convection. The instrument is calibrated for the part of the absorbed radiation lost by convection by using a laboratory source of a known magnitude of radiation.

The accuracy of the instrument under the conditions of calibration is estimated to be within 3 percent, but this accuracy is not usually attained in the field. A positive or negative error is caused by a misorientation of the instrument with respect to the prevailing wind direction. This error is considered to be compensating for periods of a week or more and is significant only above wind speeds of 15 mph (Dunkle and others, 1949). Another error occurs when rain falls on the

sensing element and a part of the incident radiation is required to evaporate the water.

In the field, the largest error is probably due to the change in absorption characteristics of the painted receiving surface. Because these characteristics change with time, the accuracy of the instrument will decrease. In order to determine how great an error may occur, four radiometers were recalibrated after a year or more of use; the average change was 6 percent.

Despite some uncertainties about its accuracy, the radiometer described has given results for the evaporation studies that appear satisfactory.

In addition to measurements of infrared radiation, measurements of ambient-air temperature, humidity, and solar radiation are obtained at the same location. A typical field installation is illustrated in figure 33, which shows the thermocouple psychrometer, Eppley pyrliometer, and the flat-plate radiometer. The flat-plate radiometer measures both solar and infrared radiation. Long-wave radiation during the day is determined by subtracting solar radiation from the total radiation received by the flat-plate radiometer.

FIGURE 33.—A radiation station, showing the Eppley pyrliometer to the left and the flat-plate radiometer to the right on top of the mast; directly below is the thermocouple psychrometer.

LONG-WAVE RADIATION RELATIONSHIPS

Most long-wave radiation from the atmosphere has wave lengths of between 4 and 120 μ (microns). In this wave-length range, water vapor, ozone, carbon dioxide, and oxygen have strong absorption bands. Some of these bands are narrow and do not occur frequently in the 4 to 120 μ range. However, water vapor, which is the principal absorber of radiation in the atmosphere, has absorption bands throughout this range. Radiation

from the atmosphere, then must come from water vapor, ozone, carbon dioxide, and oxygen because, according to Kirchoff's law, they emit radiation as strongly as they absorb.

To avoid dealing with the highly variable content of water vapor in the air, some investigators (Brunt, 1944; Angstrom, 1920) have treated the atmosphere as a gray body, and others (Elsasser, 1942) have taken into account the variability of the water-vapor spectrum. The simplest method to determine long-wave radiation received at the surface is to treat the atmosphere as a gray body and choose a suitable emissivity. In this method, Stefan's law is used, the variable being the temperature of the ambient air, and is expressed by Brunt (1944) as

$$\frac{Q_a}{\sigma T_a^4} = c + d\sqrt{e_a} \quad (1)$$

where

- Q_a = the radiation received, in cal $\text{cm}^{-2} \text{ day}^{-1}$,
- σ = the Stefan Boltzmann constant, 5.6697×10^{-5} erg $\text{cm}^{-2} \text{ sec}^{-1} (\text{°K})^{-4}$,
- T_a = the air temperature in °K ,
- c = constant,
- d = constant,

and

e_a = vapor pressure of the air in millibars.

The spectrum of water vapor is not continuous but is a line spectrum which obeys a square-root law of absorption and emission. According to Elsasser (1942), Brunt's equation will nearly approximate this relationship, but a logarithmic equation for the vapor-pressure term would give a truer relationship. Because the vapor-pressure term is rather small, the choice of using the square-root or logarithmic relationship was considered to be of minor consequence and the square-root relationship was used in these studies.

The long-wave radiation data obtained in the evaporation studies were used to evaluate the constant coefficient d , in equation 1. A value of 0.0263 for d gave the truest results. Anderson (1954) listed nine investigators who determined values for d in Brunt's equation; their values ranged from 0.029 to 0.082. The value of 0.0263, used in this report, is slightly below this range, but the difference is not considered to be significant.

Most investigators have considered the c term in Brunt's equation to be almost constant, but some variation with the amount of cloud cover has been noted. In the course of this study, it was noted that correlation was better if c varied with air temperature and cloud cover. Continuous observations of cloud cover are difficult to obtain, and it was found that this effect could be related to the ratio of the measured

solar radiation to solar radiation received if a clear sky had existed for the period of study. It is easy to compute the clear-sky radiation for any latitude, and in any heat-budget study, measurements of solar radiation are generally made by some type of instrument or are available from a nearby U.S. Weather Bureau office. In determining the clear-sky solar radiation received at the earth, a solar constant of $1.6 \text{ cal cm}^{-2} \text{ min}^{-1}$ is used.

The family of curves shown in figure 34 was drawn using the air temperature as the abscissa and the value

of c as the ordinate. Each curve in the series has a constant value of the ratio of measured solar radiation to clear-sky radiation. These curves were drawn from the data taken in connection with the evaporation studies.

The values of c determined by nine investigators, as listed by Anderson (1954), ranged from 0.43 to 0.68. The maximum value of c , which is indicated by figure 2, is 0.735. If a higher value of d had been chosen, then the maximum value of c would have been less, and very close to the range listed in Anderson (1954).

FIGURE 34.—Family of curves for determining the value of the c constant in Brunt's equation for atmospheric infrared radiation.

The curves of figure 2 are not adequately defined by data below air temperature of 10° C . A minimum value of c is not indicated, and consequently no comparison can be made with results obtained by other investigators.

A comparison of the computation of infrared radiation by Brunt's equation using values of c and d as defined in this study, with those obtained by measurement of radiation is shown in table 1. The average percent differ-

ence, without regard to sign, for all periods between computed and measured amounts of radiation varied from 2.0 to 11.7 percent. The differences between the measurements and computations do not appear to be significantly related to location. More agreement is obtained when the computations are made for periods of a month or longer, than for shorter periods such as a week. This agreement would probably indicate that the variability of the moisture content of the upper

TABLE 1.—*Computations of infrared radiation by Brunt's relationship as modified and compared with measurements of infrared radiation*

Radiation station				Period of radiation measurement	Computation periods		Percent of difference between computed and measured radiation		Comparisor of average radiation for all periods		
Name	Elevation above sea level (feet)	Latitude	Longitude		Number	Days per period (average)	Average	Maximum	Computed	Measured	Difference in percent
Lake Hefner:											
a.-----	1,200	35°34'	97°36'	7/50- 8/51----	20	6	3.4	14.3	763	745	+2.4
b.-----				5/58-10/58----	18	8	7.1	30.1	624	659	-5.3
Lake Mead-----	1,180	36°03'	114°46'	3/52- 9/53----	19	30	3.7	9.3	715	719	-.6
Granby ¹ -----	8,300	40°05'	105°50'	6/55-10/55, 6/56-10/56.	10	31	4.0	10.8	581	603	-3.6
Essar Ranch Lake-----	770	29°26'	98°39'	6/56-12/56----	24	7	3.5	18.0	712	712	0
Pikes Peak ¹ -----	10,900	38°47'	105°00'	6/56-10/56----	17	7	11.7	21.1	558	497	+12.3
Moss Bluff-----	30	29°56'	94°43'	3/57- 8/57----	31	5	2.9	7.8	761	754	+.9
Honey Creek-----	650	33°20'	96°45'	9/57-10/58----	12	30	2.6	7.1	707	700	+1.0
San Vicente-----	660	32°55'	116°55'	9/57-10/59----	24	30	3.2	11.2	665	648	+2.6
Roosevelt Reservoir-----	2,100	33°40'	111°09'	3/58- 1/60----	21	30	4.5	11.2	678	657	+3.2
Lake Mohave-----	600	35°10'	114°35'	8/59-10/60----	12	34	2.0	4.3	736	741	-.7
Barrett-----	1,700	32°41'	116°40'	11/59-10/61----	24	30	5.2	11.9	642	628	+2.2

¹ Solar constant of 1.7 cal cm⁻² day⁻¹ was used for computing clear sky radiation.

atmosphere and cloud cover are less important for long periods than for short periods. Computations for radiation for stations at higher altitudes did not agree as well as those for radiation for stations at lower altitudes. However, no reasonable explanation of the effect of altitude can be offered at this time. Data used to determine the values in table 1 are presented in table 3.

Brunt's equation as modified can be used to determine the long-wave radiation received at an area if surface measurements are made of air temperature, humidity, and solar radiation. Use of periods of a week or longer to compute the average infrared radiation received will minimize errors caused by such atmospheric occurrences as inversions and frontal passages. If inversions occur frequently during any period, the relationship computed by Brunt's equation will be in error, for the actual long-wave radiation will be greater. The modified equation is based on data obtained where fog or precipitation seldom occurred. It is doubtful that the relationships in figure 34 would be valid under such circumstances.

An example is presented of the use of Brunt's equation as modified: If an area at lat 35° has the same representative atmospheric conditions as that measured at a central station, then the infrared radiation received for that area can be computed. Assume for this area that the following data were obtained for the period June 1 to 7:

- Average temperature of the air 25° C;
- Average vapor pressure of the air 16 mb;
- Average measured solar radiation received 700 cal cm⁻² day⁻¹.

From the solar radiation chart (fig. 35), read the amount of solar radiation that would have been received for this period if no clouds had been present (827 cal cm⁻² day⁻¹). The ratio of measured solar to clear-sky

radiation is then 0.85. The value of c in Brunt's equation, as determined from figure 35, is 0.72 for a temperature of 25° C and a ratio of 0.85. The right side of equation 1 is equal to $0.0263\sqrt{16} + 0.72$, or 0.83, and this value is the emissivity of the atmosphere for the period. The infrared radiation from table 2 for a temperature of 25° C is 924 cal cm⁻² day⁻¹ for an emissivity of 1.00. This value, when multiplied by the emissivity of 0.83, is computed to be 767 cal cm⁻² day⁻¹.

TABLE 2.—*Infrared radiation from a black body at temperatures between 0° C and 39° C*

Temperature (° C)	Infrared radiation (cal cm ⁻² day ⁻¹)	Temperature (° C)	Infrared radiation (cal cm ⁻² day ⁻¹)
0-----	651	20-----	863
1-----	660	21-----	875
2-----	670	22-----	887
3-----	679	23-----	899
4-----	689	24-----	911
5-----	699	25-----	924
6-----	709	26-----	936
7-----	720	27-----	948
8-----	730	28-----	961
9-----	740	29-----	974
10-----	751	30-----	987
11-----	762	31-----	1000
12-----	772	32-----	1013
13-----	783	33-----	1027
14-----	795	34-----	1040
15-----	806	35-----	1054
16-----	817	36-----	1068
17-----	828	37-----	1082
18-----	839	38-----	1096
19-----	851	39-----	1109

SOLAR RADIATION REFLECTED FROM WATER SURFACE

If a heat budget is to be made for a body of water, the amount of solar radiation reflected from the water surface must be known. Anderson (1954) presented curves to determine the amount of reflected solar radiation on the basis of sun, altitude, and cloud cover. Because this method is tedious and time consuming, a family of curves is presented in figure 36 for determining the reflected solar radiation directly from the

FIGURE 35.—Clear-sky solar-radiation chart at latitudes between 25° and 50° for all months.

FIGURE 36.—A relationship to determine reflected solar radiation from measured solar radiation for clear and cloudy skies.

measured solar radiation. There are two curves in this family, one for a ratio of measured to clear-sky solar radiation greater than 0.80 and the other for a ratio less than 0.80. However, either curve, if used for all determinations, will give results within an accuracy of 10 percent.

The methods presented in this report for determining infrared radiation from the atmosphere and reflected solar radiation can be used in those studies where adequate instrumentation cannot be maintained. Although the data on which the long-wave determination is based may be of uncertain accuracy, the results are superior to those obtained by using other relationships where a limited amount of data is available. In parts of the country where rain and inversions occur frequently, the long-wave relationship will undoubtedly

give values that are low but still of the correct order of magnitude.

REFERENCES CITED

- Anderson, E. R., 1954, Energy-budget studies, in Water-loss investigations: Lake Hefner studies, technical report: U.S. Geol. Survey Prof. Paper 269, p. 71-119.
- Angstrom, A., 1920, Application of heat radiation measurements to the problem of the evaporation from lakes and the heat convection at their surfaces: *Geografiska Annaler*, v. 2, p. 237.
- Brunt, D., 1944, Physical and dynamical meteorology: Cambridge Univ. Press, p. 105-122, 124-145.
- Dunkle, R. V., and others, 1949, Nonselective radiometers for hemispherical irradiation and net radiation interchange measurements: California Univ. Engineering Dept., Thermal Radiation Proj. Rept. 9, 27 p.
- Elsasser, W. M., 1942, Heat transfer by infrared radiation in the atmosphere: Harvard Univ. Meteorological Studies 6, Blue Hill Meteorological Observatory, Milton, Mass., p. 7-94.

TABLE 3

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown

[Estimated clear-sky solar radiation: Granby, Colo., all dates computed using solar constant of 1.70 cal cm⁻² min⁻¹; Pikes Peak, Colo., June, July, August, September, and October, 1956, computed using solar constant of 1.70 cal cm⁻² min⁻¹]

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)
LAKE HEFNER, OKLAHOMA										
1950										
July						August				
1	691	826	740	25.4	9.1				21.1	22.8
2	657	826	765	26.4	20.8				23.9	19.0
3	488	825	797	26.2	21.0				23.9	19.8
4			779	23.1	23.0					
5	510	823	772	24.9	24.0					
6			774	24.1	23.0	444	770	896	24.7	26.2
7			753	24.6	23.3	595	768	847	26.8	23.6
8			768			656	765	806	26.6	23.3
9	241	819	819			660	762	764		
10						557	759	798	26.0	23.0
11				23.8	24.1	581	756	811	27.5	25.3
12				24.5	23.0	627	753	779	28.0	24.2
13	682	815	755	21.6	17.8	648	750	802		
14			684	22.4	18.7					
15				26.3	24.5					
16				27.6	24.5				24.0	24.2
17	250	811	779						22.5	22.5
18	188	810	789			637	736	767	22.3	17.8
19	359	808				658	733	737		
20						193	729	743	14.7	12.9
21									19.5	17.3
22									23.5	21.7
23		800		24.3	21.2				22.3	21.6
24	568	798	737	24.7	24.5				26.3	24.8
25				23.4	25.0				27.7	23.8
26				22.3	21.8				26.8	23.2
27				24.1	22.5				23.6	22.1
28										
29				24.3	25.8				20.7	18.4
30				25.3	26.2					
31				26.3	25.0	485	688	602	19.9	17.0
LAKE HEFNER, OKLAHOMA—Continued										
1950—Continued										
November						December				
1	343	410	631	17.0	9.7	283	314	607	14.1	
2	165	406	524			262	312	608	8.1	
3	61	402	592	3.5	6.8	293	310	496	1.7	
4	376	398	488	4.8	4.9				7.0	
5	366	394	588			94	307	526		
6	340	390	592			316	306	414		
7	283	386	602	11.8	8.5	128	305	446		
8	272	382	608	9.9		289	304	516	3	
9	358	378	521			276	303	546	6.5	
10	357	374	485				302		4.3	
11	336	371	479	2.0			301			
12	338	368	516	6.3	4.3		300			
13	325	364	568	9.5	7.6	247	299	537	3.2	
14				16.3	12.8	233	298	556	6.4	
15	268	358	650	19.6	13.8	258	297	551	3.7	
16	322	355	551	8.4				579	4.1	
17	215	352	574	9.1						
18	239	349	647	14.2						
19	265	346	651	13.5					3.6	
20	323	343	547	1.8		171	294	626	1.9	
21	302	341	599	8.7		255	294	633	5.9	
22	304	338	606					548	7.2	
23	217	335	560	1.1					8.2	
24	329	332	463	-3.2		273	295	580	8.8	
25	288	329	523	5.2		259	295	601	12.3	
26	295	327	522	3.6		282	295	520	-7	
27	288	324	555	8.0		240	295	500	-4.9	
28	282	321	547	7.3		290	296	501	-3	
29	264	318	541	7.1		67	296		1.4	
30	271	316	567	8.6						
31						268	297	535		
1951										
January						February				
1						391	370	369	-12.7	
2						386	374	426	-5.4	
3						348	377	495	-5	
4	320	300	557	2.2		327	381	538	4.9	
5	253	302	570	6.2	5.0	234	385	666		
6	292	304	594	5.5	5.7					
7	276	305	557	-3.3						
8	313	306	473	-1.0						
9	327	308	504	2.9						
10			526							
11	324	311				379	402	521	8	
12	171	313	559			372	406	587	10.5	6.1
13	219	314				380	410	632	15.3	9.8
14						332	414	651	9.1	
15						37	419	592		
16						115	423	572		
17	325	320	545	6.8	5.3	216	427	577	-5.3	
18	331	323	584	9.9	4.8	435	431	506	-8	
19	272	326	626	12.1	4.7	372	435	576	5.0	6.4
20	337	328	593	11.7	4.7			606		
21	340	331	582	13.6	4.1	341	444			
22	192	334	532	.6						
23	293	336	491	-2.6				597		
24	282	339	567			437	457	584	10.0	8.5
25	304	342	548	4.6	4.4	299	461			
26	282	345	548	4.4	4.0	269	466	694	11.3	9.0
27	331	348	575	2.7	3.7	60	470			
28	353	351	591	10.0	4.4	459	474	558		
29	152	354	574			410	479	647	12.9	10.7
30	213	357	509			400	484	629	12.5	7.6
31	337	360	441							
	292	364	485							
	219	367	495	-11.6						

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)
LAKE HEFNER, OKLAHOMA—Continued										
1951—Continued										
	March					April				
1	447	489	615	9.5	6.1	133	633	697	6.1	6.3
2	174	494	769	17.8	—	651	638	—	5.8	6.1
3	490	498	613	7.0	4.5	—	—	588	10.6	6.0
4	503	502	558	6.4	5.8	461	647	673	17.1	—
5	—	—	601	13.9	4.0	—	—	—	—	—
6	288	512	608	14.2	—	363	656	679	11.8	—
7	442	516	550	5.3	5.3	—	—	595	8.8	6.8
8	323	520	608	3.6	5.0	671	665	527	8.7	4.4
9	—	—	—	—	—	681	669	547	10.5	3.9
10	213	530	—	—	—	300	674	636	7.8	7.5
11	136	535	—	—	—	621	678	535	—	5.0
12	348	539	516	—	—	561	682	515	—	4.5
13	560	544	476	—	—	682	686	—	—	4.0
14	539	549	494	—	—	667	690	598	15.7	5.3
15	387	554	519	3.6	5.5	660	694	594	7.9	4.5
16	—	—	605	11.6	6.9	613	698	572	6.9	3.6
17	340	562	600	7.3	6.8	581	702	597	13.3	4.3
18	542	566	522	1.2	—	559	706	665	—	—
19	—	—	503	4.0	4.2	610	710	653	—	—
20	494	576	537	7.4	4.1	—	—	686	—	—
21	577	581	526	5.2	5.5	524	717	616	—	—
22	528	585	651	17.6	5.4	636	720	626	8.1	5.8
23	534	590	603	12.3	4.5	668	724	587	13.8	7.3
24	513	595	543	8.2	3.9	558	728	721	20.2	10.7
25	562	600	595	13.6	—	410	731	734	16.1	12.0
26	271	604	611	12.3	—	580	735	692	—	—
27	—	—	603	—	—	615	738	721	—	—
28	—	—	—	—	—	609	742	761	23.0	17.0
29	550	618	—	—	—	—	—	—	—	—
30	612	623	585	9.9	4.2	—	—	—	—	—
31	485	628	686	13.7	—	—	—	—	—	—
	May					June				
1	—	—	—	—	—	—	—	—	24.5	21.0
2	730	755	595	17.9	9.6	—	—	—	17.6	15.5
3	727	758	621	18.9	9.4	564	818	689	13.7	12.0
4	714	761	624	18.2	9.9	680	820	659	15.2	12.3
5	589	764	660	19.3	11.0	464	821	—	18.6	17.0
6	271	767	701	12.3	8.5	—	—	—	21.1	20.5
7	693	769	631	13.0	8.4	—	—	—	21.9	18.8
8	627	771	665	17.0	12.3	726	824	—	24.5	22.1
9	—	—	—	—	—	—	—	—	21.2	18.6
10	341	775	—	—	—	—	—	744	20.0	19.0
11	720	777	597	15.2	11.3	—	—	—	19.3	19.2
12	493	779	683	17.0	11.4	—	—	—	20.4	18.6
13	—	—	661	18.8	11.9	702	827	750	22.1	18.9
14	—	—	736	21.0	13.7	642	827	773	22.0	20.0
15	211	785	—	20.2	20.0	672	827	—	22.5	19.8
16	375	787	—	20.5	18.7	735	828	791	24.7	19.5
17	180	789	—	—	—	723	828	—	25.7	22.9
18	436	791	—	16.9	16.4	417	828	790	24.4	22.8
19	—	—	—	20.2	18.8	—	—	847	25.7	22.8
20	—	—	—	—	—	—	—	—	—	—
21	618	797	—	—	—	—	—	—	26.1	24.5
22	—	—	—	16.9	16.3	—	—	—	25.6	22.7
23	—	—	—	—	—	596	830	821	25.6	21.2
24	—	—	—	—	—	646	829	812	24.5	21.2
25	—	—	—	17.4	16.2	474	829	833	25.4	26.2
26	—	—	—	19.8	12.3	722	829	806	26.9	22.3
27	335	806	729	18.1	14.7	715	828	790	26.9	20.3
28	654	808	786	21.6	19.2	640	828	810	26.4	21.7
29	700	810	—	24.8	21.5	483	827	825	26.7	22.9
30	—	—	—	—	—	239	827	813	20.2	18.6
31	—	—	—	—	—	—	—	—	—	—
	May					June				
1	—	—	—	—	—	—	—	—	700	815
2	—	—	—	—	—	—	—	—	680	816
3	—	—	—	—	—	—	—	—	700	818
4	—	—	—	—	—	—	—	—	717	820
5	—	—	—	—	—	—	—	—	677	821
6	—	—	—	—	—	—	—	—	568	823
7	—	—	—	—	—	—	—	—	697	823
8	—	—	—	—	—	—	—	—	699	824
9	—	—	—	—	—	—	—	—	654	824
10	—	—	—	—	—	—	—	—	656	825
11	—	—	—	—	—	—	—	—	721	826
12	—	—	—	—	—	—	—	—	628	826
13	—	—	—	—	—	—	—	—	640	827
14	—	—	—	—	—	—	—	—	717	827
15	182	783	773	19.8	19.5	—	—	—	521	827
16	263	785	722	19.6	19.8	—	—	—	521	827
17	657	787	787	21.5	18.6	—	—	—	287	828
18	470	789	781	20.9	18.4	—	—	—	575	828
19	499	791	762	21.5	18.2	—	—	—	572	828
20	722	793	695	20.4	13.4	—	—	—	563	828
21	716	795	709	21.9	13.4	—	—	—	263	828
22	710	797	687	22.4	14.5	—	—	—	245	828
23	692	799	712	23.5	15.7	—	—	—	519	830
24	569	801	789	24.6	18.5	—	—	—	586	830
25	489	802	821	24.2	20.7	—	—	—	682	828
26	670	803	759	23.8	17.2	—	—	—	188	828
27	682	805	795	23.8	17.5	—	—	—	740	828
28	569	806	858	28.4	21.7	—	—	—	724	828
29	510	808	829	23.7	21.6	—	—	—	718	828
30	659	810	824	25.0	21.7	—	—	—	692	827
31	685	812	788	25.1	22.2	—	—	—	692	827
32	660	814	790	27.7	21.9	—	—	—	619	680
	May					June				
1	—	—	—	—	—	—	—	—	700	815
2	—	—	—	—	—	—	—	—	680	816
3	—	—	—	—	—	—	—	—	700	818
4	—	—	—	—	—	—	—	—	717	820
5	—	—	—	—	—	—	—	—	677	821
6	—	—	—	—	—	—	—	—	568	823
7	—	—	—	—	—	—	—	—	697	823
8	—	—	—	—	—	—	—	—	699	824
9	—	—	—	—	—	—	—	—	654	824
10	—	—	—	—	—	—	—	—	656	825
11	—	—	—	—	—	—	—	—	721	826
12	—	—	—	—	—	—	—	—	628	826
13	—	—	—	—	—	—	—	—	640	827
14	—	—	—	—	—	—	—	—	717	827
15	—	—	—	—	—	—	—	—	521	827
16	—	—	—	—	—	—	—	—	287	828
17	—	—	—	—	—	—	—	—	575	828
18	—	—	—	—	—	—	—	—	572	828
19	—	—	—	—	—	—	—	—	563	828
20	—	—	—	—	—	—	—	—	263	828
21	—	—	—	—	—	—	—	—	245	828
22	—	—	—	—	—	—	—	—	519	830
23	—	—	—	—	—	—	—	—	586	830
24	—	—	—	—	—	—	—	—	682	828
25	—	—	—	—	—	—	—	—	188	828
26	—	—	—	—	—	—	—	—	740	828
27	—	—	—	—	—	—	—	—	724	828
28	—	—	—	—	—	—	—	—	718	828
29	—	—	—	—	—	—	—	—	692	827
30	—	—	—	—	—	—	—	—	692	827
31	—	—	—	—	—	—	—	—	619	680
	May					June				
1	—	—	—	—	—	—	—	—	700	815
2	—	—	—	—	—	—	—	—	680	816
3	—	—	—	—	—	—	—	—	700	818
4	—	—	—	—	—	—	—	—	717	820
5	—	—	—	—	—	—	—	—	677	821
6	—	—	—	—	—	—	—	—	568	823
7	—	—	—	—	—	—	—	—	697	823
8	—	—	—	—	—	—	—	—	699	824
9	—	—	—	—	—	—	—	—	654	824
10	—	—	—	—	—	—	—	—	656	

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

LAKE HEFNER, OKLAHOMA—Continued

1958—Continued

July					August					
1.....	703	826	791	26.9	23.7	469	782	770	26.3	26.1
2.....	703	826	795	27.0	22.8	652	779	809	27.8	24.7
3.....	661	825	806	27.2	23.3	659	776	849	29.4	24.1
4.....	402	824	808	26.7	22.3	650	774	839	28.8	22.5
5.....	260	823	766	22.6	21.3	628	772	820	29.2	23.6
6.....	140	822	769	20.6	23.0	609	770	775	30.0	23.1
7.....	484	821	733	21.3	20.1	409	768	823	28.4	23.0
8.....	724	820	728	22.0	19.0	608	765	802	26.2	23.7
9.....	706	819	768	25.8	23.8	549	762	838	25.1	23.7
10.....	656	818	769	27.7	24.8	610	759	845	26.5	24.8
11.....	685	817	779	28.4	22.8	635	756	801	28.2	24.2
12.....	556	816	807	22.0	23.8	626	753	830	30.6	22.7
13.....	687	815	751	26.9	23.4	633	750	785	29.0	25.4
14.....	579	814	793	27.7	25.0	624	748	812	28.2	26.8
15.....	514	813	849	28.1	24.4	604	745	855	30.0	26.2
16.....	647	812	816	29.0	25.6	440	742	860	28.6	24.9
17.....	675	811	790	29.2	23.2	245	739	772	22.4	28.6
18.....	677	810	793	29.3	21.7	596	736	781	24.7	22.5
19.....	691	808	772	29.4	17.4	600	733	788	26.4	21.6
20.....	436	806	755	26.2	22.2	98	729	828	24.3	25.8
21.....	455	804	777	24.6	21.7	422	725	755	24.3	24.7
22.....	659	802	835	25.6	22.2	565	722	717	22.4	20.0
23.....	665	800	805	26.7	19.1	563	718	802	24.6	22.1
24.....	672	798	771	29.0	24.2	572	715	712	23.8	18.5
25.....	448	796	803	26.8	26.1	581	711	703	23.2	16.9
26.....	661	794	818	26.9	25.3	609	707	724	26.6	18.4
27.....	602	792	760	27.0	25.5	604	703	764	27.3	20.9
28.....	572	790	790	26.4	25.9	596	700	779	29.0	28.8
29.....	658	788	804	28.7	24.4	599	696	720	29.0	18.5
30.....	623	786	817	30.3	24.3	596	692	746	27.2	20.9
31.....	610	784	857	29.8	24.9	571	688	812	27.1	22.3

LAKE MEAD, ARIZONA-NEVADA

1952

March					April					
1.....	316	489	619	10.9	8.0	598	633	651	18.7	6.0
2.....	434	494	599	-----	-----	611	638	615	17.9	7.5
3.....	497	498	571	-----	-----	638	643	660	20.0	5.8
4.....	457	502	649	11.5	5.7	649	647	662	21.2	6.4
5.....	478	507	628	12.6	5.6	640	651	661	20.2	8.8
6.....	369	512	638	-----	-----	617	656	706	21.7	9.0
7.....	185	516	693	-----	-----	656	660	712	20.8	8.9
8.....	-----	520	-----	6.4	8.4	668	665	684	17.8	7.5
9.....	-----	525	604	9.8	8.7	658	669	650	17.2	5.2
10.....	178	530	637	11.0	8.3	636	674	689	15.4	8.5
11.....	451	535	613	10.0	5.6	529	678	701	15.8	7.8
12.....	489	539	589	10.1	5.7	628	682	696	-----	-----
13.....	506	544	575	9.6	6.5	650	686	674	-----	-----
14.....	541	549	601	-----	-----	673	690	633	18.5	5.8
15.....	225	554	658	-----	-----	701	694	634	18.2	5.0
16.....	455	558	674	-----	-----	686	698	654	20.9	5.5
17.....	544	562	575	-----	-----	659	702	699	22.6	6.5
18.....	316	566	609	12.7	8.5	620	706	703	21.7	8.6
19.....	565	571	598	13.7	5.8	660	710	717	-----	-----
20.....	498	576	583	10.2	3.7	457	713	724	-----	-----
21.....	598	581	554	8.4	3.8	623	717	728	-----	-----
22.....	595	585	536	8.9	3.3	679	720	715	19.1	11.2
23.....	529	590	533	8.7	3.7	688	724	685	20.9	10.2
24.....	503	595	607	12.5	6.7	512	728	704	20.3	11.8
25.....	588	600	619	16.0	6.9	622	731	740	20.2	11.6
26.....	595	604	608	15.8	7.7	595	735	714	18.8	9.2
27.....	614	608	613	16.8	5.5	181	738	694	17.4	13.0
28.....	581	613	595	15.2	7.3	349	742	557	14.1	11.4
29.....	592	618	647	17.3	8.9	310	745	726	15.9	13.0
30.....	560	623	691	20.2	7.9	686	748	694	17.1	13.0

September

October

1.....	449	684	793	27.4	22.3	397	547	529	10.9	6.9
2.....	-----	-----	-----	-----	-----	238	543	637	13.2	8.3
3.....	-----	-----	-----	-----	-----	440	538	601	15.8	11.6
4.....	-----	-----	-----	-----	-----	454	534	641	17.6	14.9
5.....	-----	-----	-----	-----	-----	484	529	672	19.2	16.8
6.....	-----	-----	-----	-----	-----	253	525	744	20.4	12.7
7.....	-----	-----	-----	-----	-----	430	521	749	23.9	21.3
8.....	527	653	810	26.1	23.8	454	517	745	24.3	21.9
9.....	392	648	794	25.5	24.8	365	513	754	23.4	18.6
10.....	460	644	799	24.0	23.8	483	508	652	16.8	2.8
11.....	209	640	726	22.0	22.5	181	503	739	17.6	10.0
12.....	422	636	740	21.7	20.1	743	499	684	15.6	11.6
13.....	529	632	709	22.7	18.8	444	494	662	19.0	12.8
14.....	452	628	694	23.0	20.7	181	489	735	19.9	14.1
15.....	153	624	730	20.8	21.8	307	485	710	19.7	16.1
16.....	397	619	806	20.7	20.5	437	480	583	20.1	15.3
17.....	576	614	541	16.6	13.0	385	476	646	20.9	16.0
18.....	565	610	650	19.9	16.1	409	472	655	20.7	14.7
19.....	147	605	786	21.4	22.5	413	467	648	21.8	14.4
20.....	287	600	786	22.6	22.9	395	462	690	22.7	16.5
21.....	410	595	820	22.9	23.7	292	458	599	17.8	8.2
22.....	328	590	778	23.8	23.5	424	453	478	15.0	7.6
23.....	276	585	820	25.8	26.7	414	448	581	19.0	9.5
24.....	493	580	797	27.4	25.7	345	444	664	17.5	10.1
25.....	449	576	687	24.2	22.4	369	440	478	13.0	8.1
26.....	414	572	700	21.8	20.2	98	435	584	9.3	8.1
27.....	533	567	620	18.6	10.8	322	431	532	10.4	6.7
28.....	490	562	619	16.8	9.3	293	427	467	9.1	7.5
29.....	141	557	745	18.0	14.8	265	422	482	8.6	7.0
30.....	166	552	669	13.0	10.6	298	418	557	10.7	7.7
31.....	-----	-----	-----	-----	-----	142	414	562	10.2	7.6

May

June

1.....	714	752	704	20.9	14.7	743	815	736	26.5	6.3
2.....	721	755	736	24.1	11.6	632	816	782	23.9	10.7
3.....	560	758	736	25.2	10.0	575	818	793	23.9	14.8
4.....	742	761	698	25.0	7.0	733	820	806	27.5	17.8
5.....	751	764	686	25.1	8.0	753	821	842	30.8	9.2
6.....	731	767	729	25.8	6.5	773	822	806	29.7	10.9
7.....	688	769	747	26.0	10.0	754	823	779	29.0	8.6
8.....	752	771	670	22.0	6.3	809	824	763	28.9	9.3
9.....	749	773	707	22.9	6.6	778	824	735	27.4	10.9
10.....	752	775	677	24.1	7.1	790	825	763	25.6	7.0
11.....	750	777	699	24.5	9.1	785	826	769	28.0	10.0
12.....	706	779	731	26.9	7.7	802	826	749	26.3	6.2
13.....	766	781	760	29.0	6.2	791	827	793	28.0	7.5
14.....	751	783	744	26.8	7.8	784	827	768	-----	-----
15.....	676	785	671	23.2	8.2	-----	827	-----	-----	-----
16.....	653	787	659	19.1	7.3	-----	828	-----	29.2	7.0
17.....	755	789	649	22.0	8.2	-----	828	-----	28.2	9.8
18.....	665</									

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

LAKE MEAD, ARIZONA-NEVADA—Continued										
1952—Continued										
July					August					
1	763	826	800	30.6	11.0	720	782	820	32.2	16.7
2	770	826	822	31.7	9.4	721	779	825	33.6	14.8
3	752	825	869	32.8	11.8	710	776	845	35.0	14.1
4	532	824	904	34.4	12.8	709	774	864	35.5	15.5
5	646	823	907	33.8	15.4	610	772	890	34.6	18.9
6	646	822	892	32.8	17.7	605	770	901	34.5	19.3
7	676	821	878	33.6	13.0	655	768	899	35.2	18.3
8	215	820	892	32.2	16.5	675	765	908	35.8	17.0
9	647	819	848	31.1	11.8	632	762	901	34.5	17.4
10	772	818	792	32.7	11.5	690	759	843	34.6	11.9
11	779	817	792	33.0	8.9	703	756	813	33.5	13.9
12	770	816	792	32.0	9.2	701	753	835	32.0	13.0
13	780	815	792	30.4	8.8	668	750	864	32.4	17.8
14	781	814	785	31.2	10.0	680	748	871	33.5	16.5
15	755	813	806	33.4	11.8	677	745	872	33.7	18.7
16	751	812	817	33.5	10.4	643	742	864	31.7	19.4
17	742	811	807	34.2	10.0	663	739	878	32.5	19.3
18	757	810	824	34.0	11.6	513	736	878	33.8	19.8
19	743	808	812	36.0	10.5	624	733	893	34.7	19.9
20	716	806	841	34.4	19.0	644	729	899	33.5	16.6
21	725	804	853	35.0	16.6	650	725	878	33.6	16.1
22	717	802	856	35.4	15.3	652	722	878	33.3	15.4
23	637	800	927	34.6	16.5	656	718	856	34.4	11.8
24	454	798	939	30.7	22.4	647	715	865	33.2	14.0
25	636	796	925	31.9	21.9	482	711	878	31.5	18.7
26	599	794	911	32.9	22.7	537	707	893	31.4	18.0
27	704	792	-----	32.2	19.6	653	703	899	31.7	17.3
28	613	790	-----	31.2	20.0	559	700	883	31.1	17.4
29	529	788	842	27.7	23.0	638	696	830	31.3	15.7
30	705	786	827	29.2	21.8	626	692	810	33.4	11.6
31	686	784	827	31.5	21.0	-----	688	795	32.1	13.7

LAKE MEAD, ARIZONA-NEVADA—Continued										
1952—Continued										
November					December					
1	368	410	685	21.1	11.7	267	314	642	9.1	7.1
2	316	406	662	20.9	-----	301	312	590	11.7	-----
3	364	402	663	20.8	-----	285	310	576	10.5	5.3
4	376	398	670	19.6	-----	306	308	570	9.0	6.0
5	340	394	664	17.9	-----	137	307	647	7.7	6.6
6	368	390	663	17.8	-----	286	306	654	-----	-----
7	153	386	698	17.2	-----	194	305	662	-----	-----
8	280	382	712	17.1	-----	280	304	640	-----	-----
9	377	378	590	16.9	-----	284	305	613	12.1	6.5
10	364	374	584	13.8	6.2	288	302	599	11.2	7.0
11	332	371	620	14.3	-----	289	301	584	11.4	-----
12	275	368	663	16.9	7.0	283	300	592	13.1	8.5
13	292	364	671	17.0	7.7	289	295	642	16.4	7.8
14	223	361	668	15.6	8.2	280	298	634	14.9	9.9
15	89	358	628	11.2	7.6	284	297	620	13.1	-----
16	188	355	661	9.6	8.3	125	296	669	13.2	9.9
17	328	352	611	10.8	7.1	88	296	677	13.4	-----
18	331	349	627	12.3	6.3	100	295	655	12.2	-----
19	333	346	619	13.6	6.4	163	295	656	13.7	-----
20	325	343	619	13.0	6.9	86	294	683	12.7	-----
21	271	341	649	12.6	7.5	278	294	569	11.4	7.0
22	325	338	643	10.2	4.4	293	294	576	9.6	6.7
23	115	335	633	8.5	4.8	301	295	586	8.9	-----
24	331	332	548	9.2	3.9	161	295	593	7.0	-----
25	325	329	569	8.7	5.3	254	295	606	7.8	-----
26	319	327	554	8.2	4.4	295	295	562	8.0	-----
27	321	324	547	6.7	3.3	275	295	587	8.2	-----
28	316	321	547	7.0	4.5	254	296	584	9.2	-----
29	268	318	620	8.1	3.8	271	296	576	8.9	-----
30	232	316	647	10.1	5.8	221	297	628	10.4	7.2
31	-----	-----	-----	-----	-----	271	297	619	10.4	8.0

1953										
September					October					
1	637	684	784	31.3	13.9	517	547	685	27.3	15.0
2	616	679	814	31.9	16.3	511	543	676	26.4	14.9
3	610	675	861	34.0	14.0	482	538	691	26.8	15.7
4	545	671	857	34.3	12.7	484	534	691	26.6	15.8
5	543	666	838	32.5	16.4	-----	529	712	27.0	14.7
6	518	662	850	33.3	13.9	498	525	698	27.1	12.0
7	497	657	850	32.3	15.6	-----	521	723	26.0	11.8
8	623	653	843	33.0	12.9	469	517	700	25.7	11.5
9	491	648	823	31.9	7.4	486	513	763	25.8	11.7
10	594	644	776	27.7	6.8	485	508	743	25.2	11.7
11	595	640	742	21.9	6.0	472	503	743	25.1	-----
12	573	636	755	23.8	7.0	470	499	692	25.4	-----
13	599	632	755	24.9	7.6	473	494	677	24.7	13.0
14	592	628	794	28.3	8.6	470	489	663	25.9	11.1
15	586	624	808	27.7	8.5	469	485	678	23.8	9.8
16	490	619	820	29.5	10.8	341	480	670	22.1	10.6
17	557	614	836	31.3	13.0	314	476	699	21.8	12.2
18	546	610	823	30.0	15.5	434	472	692	24.8	11.1
19	75	605	767	25.9	17.8	422	467	677	24.2	11.8
20	-----	600	-----	20.1	20.4	398	462	663	23.3	12.1
21	457	595	729	23.0	19.7	418	458	655	22.5	11.8
22	528	590	747	25.2	17.7	428	453	619	22.8	12.7
23	526	585	755	26.6	17.8	433	448	627	22.4	13.2
24	517	580	769	27.4	15.6	422	444	640	21.7	13.0
25	526	576	763	27.2	18.6	292	440	620	20.7	12.0
26	405	572	720	26.1	16.5	416	435	620	20.4	11.8
27	519	567	706	27.2	16.7	424	431	643	20.7	11.7
28	515	562	721	26.5	15.2	418	427	626	20.8	13.0
29	509	557	706	26.8	16.3	379	422	-----	20.1	11.1
30	513	552	691	28.0	13.1	336	418	-----	21.2	12.5
31	-----	-----	-----	-----	-----	385	414	650	22.4	12.0

LAKE MEAD, ARIZONA-NEVADA—Continued										
1953										
January					February					
1	286	298	590	9.9	-----	376	370	605	10.7	7.0
2	266	299	605	10.0	-----	382	374	605	11.3	6.6
3	284	300	597	10.2	-----	350	377	635	11.8	7.5
4	311	302	584	11.0	-----	379	381	620	12.4	7.5
5	289	304	605	10.0	-----	295	385	649	13.5	7.0
6	77	305	648	13.8	8.7	382	387	670	15.6	8.1
7	158	306	668	14.7	9.2	-----	392	641	15.6	8.2
8	182	308	722	14.8	12.5	213	397	627	14.9	6.0
9	-----	309	648	13.4	12.7	342	402	597	11.6	5.4
10	-----	311	628	12.9	12.3	406	406	576	10.6	4.7
11	265	313	613	12.2	11.9	398	410	591	9.0	5.7
12	280	314	656	13.0	10.7	401	414	577	12.0	5.8
13	163	316	683	14.0	10.5	420	419	599	11.9	5.9
14	288	318	621	14.0	5.6	414	423	613	11.7	6.3
15	313	320	576	12.6	5.7	360	427	597	13.0	6.0
16	296	323	591	10.3	5.2	437	431	591	12.4	5.6
17	250	326	656	10.0	6.5	458	435	590	11.2	5.8
18	231	328	649	10.7	7.0	220	439	566	11.4	4.4
19	238	331	640	11.4	7.8	452	444	542	8.1	4.5
20	218	334	655	12.6	8.5	472	448	539	7.2	3.3
21	332	336	617	14.3	6.0	482	452	525	7.9	3.6
22	341	339	599	12.4	5.2	483	457	518	8.5	3.1
23	340	342	598	12.0	7.1	295	461	597	8.9	4.0
24	298	345	613	11.8	7.8	344	466	671		

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)		Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)
LAKE MEAD, ARIZONA-NEVADA—Continued																					
1953—Continued																					
March											April										
1.....	475	489	601	10.4	5.2	623	633	677	18.5	6.7	1.....	800	826	741	33.3	9.2	495	782	883	32.1	17.6
2.....	514	494	568	8.4	6.5	630	638	698	20.5	6.4	2.....	800	826	749	31.6	9.3	742	779	778	33.3	11.0
3.....	510	498	568	10.4	5.6	620	643	697	20.7	6.5	3.....	715	825	835	34.6	9.5	751	776	741	32.5	9.7
4.....	526	502	620	11.1	5.4	637	647	683	21.4	6.9	4.....	344	824	835	34.0	12.3	745	774	726	30.6	11.4
5.....	512	507	649	14.1	8.2	603	651	597	20.4	7.5	5.....	705	823	792	33.4	14.1	752	772	-----	31.6	9.5
6.....	516	619	13.4	6.3	589	656	727	17.5	9.4	6.....	689	822	827	33.7	13.3	691	770	-----	32.3	12.8	
7.....	521	520	641	15.0	7.9	587	665	604	11.9	3.6	7.....	726	821	850	34.0	15.2	644	768	-----	34.4	17.3
8.....	508	525	633	15.7	7.4	677	669	607	12.7	3.8	8.....	551	820	899	33.9	15.0	541	765	-----	35.3	18.0
9.....	545	530	640	16.6	6.2	646	674	635	13.8	3.8	9.....	631	819	878	-----	-----	595	762	-----	33.4	18.9
10.....	538	535	633	14.1	-----	707	678	611	12.6	3.6	10.....	737	818	857	-----	-----	611	759	-----	34.2	18.6
11.....	514	539	640	16.0	-----	652	682	614	13.8	4.1	11.....	710	817	899	-----	-----	656	756	868	34.5	17.5
12.....	543	544	619	13.6	-----	293	686	681	15.0	4.6	12.....	707	816	864	-----	-----	560	753	872	34.1	17.3
13.....	572	549	590	12.8	-----	691	690	605	16.2	6.2	13.....	733	815	914	-----	-----	546	750	870	33.6	16.5
14.....	530	554	605	12.2	-----	695	694	625	17.7	5.1	14.....	461	814	886	-----	-----	570	748	830	33.2	16.5
15.....	565	558	634	15.6	-----	643	698	664	16.6	7.8	15.....	709	813	850	30.4	23.7	527	745	838	32.7	16.8
16.....	523	562	662	18.5	4.9	658	702	670	19.2	5.2	16.....	301	812	871	29.9	23.4	665	742	790	32.8	16.7
17.....	566	628	16.8	5.5	690	706	648	19.8	5.4	17.....	283	811	850	29.7	22.4	703	739	779	33.5	12.7	
18.....	419	571	683	19.7	5.7	710	704	19.7	8.4	18.....	688	810	-----	31.0	20.0	706	736	785	34.0	11.0	
19.....	554	576	676	16.6	6.2	457	713	740	-----	-----	19.....	710	808	-----	33.6	17.5	676	733	825	34.3	13.5
20.....	522	581	640	15.0	5.0	443	717	778	-----	-----	20.....	691	806	878	34.9	17.8	659	729	880	36.4	17.0
21.....	613	590	640	15.9	6.8	690	724	698	21.3	10.9	21.....	682	804	869	35.1	20.0	682	725	855	35.3	15.6
22.....	548	595	691	18.6	6.3	711	728	715	23.0	8.8	22.....	677	802	878	36.2	17.1	681	722	800	32.8	11.1
23.....	349	600	706	20.5	5.7	673	731	720	24.3	9.5	23.....	691	800	871	37.7	16.3	658	718	839	-----	-----
24.....	608	604	683	18.9	6.0	640	735	728	25.0	9.8	24.....	722	798	893	35.6	19.4	659	715	833	34.3	14.5
25.....	607	608	705	19.0	7.0	185	738	776	22.4	9.8	25.....	717	796	885	35.3	19.8	612	711	872	32.3	18.1
26.....	442	613	712	20.3	7.7	746	742	653	19.6	5.9	26.....	706	794	892	-----	-----	305	707	848	28.3	23.2
27.....	574	618	683	14.3	8.4	748	745	620	19.1	6.0	27.....	695	792	893	-----	-----	594	703	831	29.3	22.3
28.....	614	623	633	14.4	10.0	644	748	634	18.2	6.0	28.....	680	790	907	-----	-----	680	700	752	31.2	10.0
29.....	623	628	640	16.2	8.0	-----	-----	-----	-----	-----	29.....	484	788	913	34.8	19.3	658	696	772	29.0	11.8
30.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	30.....	358	786	911	31.3	19.8	653	692	724	27.4	10.4
31.....	623	628	640	16.2	8.0	-----	-----	-----	-----	-----	31.....	382	784	885	31.6	19.6	648	688	721	27.1	10.0
LAKE MEAD, ARIZONA-NEVADA—Continued																					
1953—Continued																					
July											August										
1.....	800	826	741	33.3	9.2	495	782	883	32.1	17.6	1.....	800	826	741	33.3	9.2	495	782	883	32.1	17.6
2.....	800	826	749	31.6	9.3	742	779	778	33.3	11.0	2.....	800	826	749	31.6	9.3	742	779	778	33.3	11.0
3.....	715	825	835	34.6	9.5	751	776	741	32.5	9.7	3.....	715	825	835	34.6	9.5	751	776	741	32.5	9.7
4.....	344	824	835	34.0	12.3	745	774	726	30.6	11.4	4.....	344	824	835	34.0	12.3	745	774	726	30.6	11.4
5.....	705	823	792	33.4	14.1	752	772	-----	31.6	9.5	5.....	705	823	792	33.4	14.1	752	772	-----	31.6	9.5
6.....	689	822	827	33.7	13.3	691	770	-----	32.3	12.8	6.....	689	822	827	33.7	13.3	691	770	-----	32.3	12.8
7.....	726	821	850	34.0	15.2	644	768	-----	34.4	17.3	7.....	726	821	850	34.0	15.2	644	768	-----	34.4	17.3
8.....	551	820	899	33.9	15.0	541	765	-----	35.3	18.0	8.....	551	820	899	33.9	15.0	541	765	-----	35.3	18.0
9.....	631	819	878	-----	-----	595	762	-----	33.4	18.9	9.....	631	819	878	-----	-----	595	762	-----	33.4	18.9
10.....	737	818	857	-----	-----	611	759	-----	34.2	18.6	10.....	737	818	857	-----	-----	611	759	-----	34.2	18.6
11.....	710	817	899	-----	-----	656	756	868	34.5	17.5	11.....	710	817	899	-----	-----	656	756	868	34.5	17.5
12.....	707	816	864	-----	-----	560	753	872	34.1	17.3	12.....	707	816	864	-----	-----	560	753	872	34.1	17.3
13.....	733	815	914	-----	-----	546	750	870	33.6	16.5	13.....	733	815	914	-----	-----	546	750	870	33.6	16.5
14.....	461	814	886	-----	-----	570	748	830	33.2	16.5	14.....	461	814	886	-----	-----	570	748	830	33.2	16.5
15.....	709	813	850	30.4	23.7	527	745	838	32.7	16.8	15.....	709	813	850	30.4	23.7	527	745	838	32.7	16.8
16.....	301	812	871	29.9	23.4	665	742	790	32.8	16.7	16.....	301	812	871	29.9	23.4	665	742	790	32.8	16.7
17.....	283	811	850	29.7	22.4	703	739	779	33.5	12.7	17.....	283	811	850	29.7	22.4	703	739	779	33.5	12.7
18.....	688	810	-----	31.0	20.0	706	736	785	34.0	11.0	18.....	688	810	-----	31.0	20.0	706	736	785	34.0	11.0
19.....	710	808	-----	33.6	17.5	676	733	825	34.3	13.5	19.....	710	808	-----	33.6	17.5	676	733	825	34.3	13.5
20.....	691	806	878	34.9	17.8	659	729	880	36.4	17.0	20.....	691	806	878	34.9	17.8	659	729	880	36.4	17.0
21.....	682	804	869	35.1	20.0	682	725	855	35.3	15.6	21.....	682	804	869	35.1	20.0	682	725	855	35.3	15.6
22.....	677	802	878	36.2	17.1	681	722	800	32.8	11.1	22.....	677	802	878	36.2	17.1	681	722	800	32.8	11.1
23.....	691	800	871	37.7	16.3	658	718	839	-----	-----	23.....	691	800	871	37.7	16.3	658	718	839	-----	-----
24.....	722	798	893	35.6	19.4	659	715	833	34.3	14.5	24.....	722	798	893	35.6	19.4	659	715	833	34.3	14.5
25.....	717	796	885	35.3	19.8	612	711	872	32.3	18.1	25.....	717	796	885	35.3	19.8	612	711	872	32.3	18.1
26.....	706	794	892	-----	-----	305	707	848	28.3	23.2	26.....	706	794	892	-----	-----	305	707	848	28.3	23.2
27.....	695	792	893	-----	-----	594	703	831	29.3	22.3	27.....	695	792	893	-----	-----	594	703	831	29.3	22.3
28.....	680	790	907	-----	-----	680	700	752	31.2												

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

GRANBY, COLO.										
1955										
July					August					
1						518	820	725	16.7	12.6
2						537	817	702	14.4	12.3
3						619	814	688	15.6	12.4
4						563	811	710	14.7	13.0
5						411	808	713	15.0	13.0
6	645	872	632	16.1	8.2	384	805	683	13.3	11.7
7	874	871	509	13.3	4.2	586	801	685	14.7	11.7
8	859	870	562	14.4	6.9	601	798	682	14.7	11.2
9	850	869	570	16.1	8.6	616	795	643	15.3	11.0
10	679	868	645	17.8	14.3	683	791	658	14.4	10.9
11	485	867	671	13.9	9.3	397	787	637	13.0	9.4
12	680	866	644	13.6	6.0	469	782	678	14.2	10.2
13	860	865	591	16.1	7.6	587	780	701	13.6	11.3
14	791	864	619	17.5	11.3	328	776	695	14.4	14.4
15	652	862	623	14.4	14.0	590	773	665	12.8	9.7
16	675	858	612	13.3	5.8	599	769	666	14.4	11.7
17	840	855	542	16.4	7.7	360	764	711	13.0	12.6
18	787	853	583	16.1	7.6	581	761	742	14.2	12.8
19	709	852	626	15.0	10.5	408	757	691	13.6	13.0
20	583	850	672	14.7	10.5	672	753	696	16.1	12.1
21	519	848	683	13.3	11.0	726	749	651	16.4	11.0
22	387	846	694	14.4	12.0	619	745	666	18.6	8.6
23	391	844	711	15.3	11.7	475	742	651	13.3	10.0
24	461	842	706	16.4	12.4	523	738	654	14.7	12.3
25	457	840	697	15.6	13.3	509	734	724	15.6	12.9
26	378	837	775	14.7	14.4	555	729	739	16.1	13.1
27	404	835	721	14.4	13.5	425	725	688	13.3	12.5
28	682	832	731	15.6	12.5	574	721	691	13.9	11.0
29	693	831	674	17.2	11.6	660	717	592	11.7	8.6
30	629	827	693	16.1	10.8	701	711	557	11.1	7.8
31	442	824	706	16.4	11.9	694	707	583	13.0	8.4

GRANBY, COLO.—Continued										
1956										
May					June					
1						594	863	641	12.8	8.7
2						683	865	591	12.8	6.9
3						776	867	604	13.6	6.5
4						462	870	608	10.6	7.6
5						515	870	643	10.3	8.4
6						748	871	598	10.0	6.3
7						846	872	560	12.5	7.5
8						742	873	655	14.7	7.6
9						592	875	630	13.0	8.6
10						797	876	612	14.2	9.0
11						809	877	612	15.6	6.8
12						836	878	602	15.0	7.4
13						769	879	695	14.4	7.6
14						679	879	611	15.6	9.7
15						707	880	581	16.1	7.2
16	400	829		7.5	4.6	847	880	561	12.8	5.8
17	788	831	506	9.7	5.3	628	880	601	13.3	7.7
18	672	833	577	11.4	6.0	809	881	634	15.0	8.0
19	468	835	622	12.5	6.6	635	881	599	14.4	8.6
20	554	837	630	12.8	6.7	514	881	613	12.0	8.2
21	560	840	628	10.0	8.9	846	882	602	11.7	7.0
22	427	842	621	10.0	10.2	848	882	556	11.4	6.1
23	518	844	633	10.0	9.5	800	882	589	12.5	7.0
24	558	846	611	11.4	9.3	830	882	596	15.0	8.0
25	643	848	580	10.6	8.1	608	881	589	14.4	7.5
26	493	850	589	10.0	8.4	847	881	606	14.7	8.0
27	314	852	588	8.6	8.2	844	880	623	15.6	8.8
28	662	854	599	10.0	5.6	628	880	722	15.6	10.0
29	847	856	545	11.1	6.8	583	879	729	15.0	9.7
30	794	859	574	11.1	7.3	330	879	663	11.7	10.6
31	791	861	602	13.3	8.0					

GRANBY, COLO.—Continued										
1956										
July					August					
1	724	878	665	12.8	10.0	334	820	695	13.6	11.8
2	690	877	643	12.2	10.3				13.9	10.3
3	822	876	595	12.8	8.4				12.8	7.8
4	866	875	583	13.3	8.0				13.0	6.7
5	858	873	584	15.0	8.2	775	808	581	12.5	6.6
6	734	872	631	16.4	8.6	703	805	638	13.3	8.6
7	845	871	570	14.4	8.0	738	801	616	13.9	7.7
8	823	870	712	16.1	8.0	764	798	554	12.8	6.5
9	751	869	586	16.7	8.8	778	795	579	14.2	7.3
10	498	868	621	15.0	8.5	727	791	577	13.6	6.4
11	490	867	638	12.8	9.8	629	787	650	14.4	8.6
12	365	866	658	11.7	9.9	501	782	663	13.9	10.3
13	557	865	652	11.7	9.7	652	780	697	14.4	9.2
14	504	864	670	12.8	10.8	518	776	687	16.7	10.7
15	747	862	790	14.7	9.2	550	773	662	15.6	12.8
16	820	858	598	15.0	7.6	481	769	697	13.3	12.8
17	755	855	612	15.6	8.2	305	764	680	12.8	12.2
18	644	853	587	15.0	8.0	595	761	680	12.2	10.5
19	793	852	649	14.4	10.2	378	757	649	12.2	12.1
20	771	850	641	14.4	8.2	689	753	602	12.8	10.0
21	590	848	619	15.6	8.5	522	749	613	11.1	9.6
22	230	846	620	10.8	10.0	499	745	595	11.1	9.5
23	681	844	626	13.3	9.6	544	742	607	11.7	8.7
24	785	842	635	16.1	9.6	363	738	596	11.7	9.0
25	660	840	654	16.1	9.9	524	734	600	12.0	9.2
26	602	837	647	15.0	10.8	457	729	631	12.0	9.0
27	620	835	659	15.6	10.9	685	725	591	12.8	8.5
28	581	832	634	15.8	10.2	548	721	564	11.1	7.2
29	452	831	661	15.6	10.0	582	717	558	11.4	7.5
30	408	827	666	13.9	12.1	430	711	584	11.4	6.4
31	338	824	669	12.2	11.8	691	707	548	7.2	5.7

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

GRANBY, COLO.—Continued										
1956—Continued										
September					October					
1.	694	702	523	8.9	6.3	532	546	625	8.9	6.6
2.	603	697	557	11.1	6.9	506	541	543	6.1	5.5
3.	481	692	626	13.3	8.2	445	535	530	6.7	5.5
4.	577	688	586	13.6	9.3	503	530	586	7.2	5.6
5.	690	684	479	8.9	8.4	299	525	565	7.8	6.6
6.	670	678	486	8.9	6.6	493	519	551	7.8	5.7
7.	517	673	573	10.0	6.4	401	514	574	7.2	5.8
8.	565	668	592	10.0	8.7	173	509	616	7.2	6.7
9.	419	663	622	11.1	9.6	391	504	584	7.8	6.4
10.	564	657	580	12.8	9.0	486	498	526	5.8	5.3
11.	621	652	654	14.2	9.0	460	493	561	6.4	4.7
12.	610	647	618	15.6	8.8	358	489	544	5.3	5.1
13.	538	641	607	13.3	7.4	430	483	550	2.8	4.7
14.	623	636	583	12.8	6.4	449	478	491	2.2	4.8
15.	631	631	518	10.6	5.0	467	473	496	2.8	4.6
16.	556	625	535	8.9	4.3	469	467	491	3.6	4.6
17.	616	620	543	9.4	5.2	404	463	488	3.3	3.6
18.	613	615	538	10.6	4.8	458	458	504	3.3	4.3
19.	599	610	560	11.1	6.2	307	453	508	0	3.7
20.	580	604	615	11.7	5.3	457	447	478	-6	3.5
21.	269	599	628	9.4	7.5	449	442	460	1.7	3.3
22.	553	595	559	8.6	5.6	372	438	500	2.5	3.2
23.	595	589	493	6.1	4.1	260	432	557	5.3	4.5
24.	579	584	514	7.2	4.5	116	427	599	1.1	5.3
25.	579	579	514	7.8	4.0				-2.8	2.7
26.	570	573	538	8.3	4.8				2.0	4.3
27.	414	567	627	10.0	5.2	392	412	482	2.0	4.6
28.	382	562	638	10.6	6.8				1.1	3.7
29.	532	557	605	10.3	5.8				-2.0	3.5
30.	496	551	554	7.2	6.4				-2.2	2.8
31.									-1.1	3.3

ESSAR RANCH LAKE, SAN ANTONIO, TEX.										
1956										
June					July					
1.					647	816	858	27.8	23.0	
2.					529	815	899	28.0	22.8	
3.					523	815	858	26.5	23.0	
4.					602	815	893	28.5	23.3	
5.					749	814	843	28.8	20.2	
6.					758	814	799	29.0	18.6	
7.					759	813	814	29.2	19.5	
8.					754	813	828	29.5	21.0	
9.					732	812	819	28.2	22.3	
10.					652	812	830	27.0	23.5	
11.					713	811	828	27.8	23.0	
12.					694	810	794	27.5	23.9	
13.					709	809	811	28.2	22.8	
14.					716	808	797	28.5	20.0	
15.					724	807	779	29.0	21.7	
16.										
17.										
18.										
19.										
20.										
21.										
22.	776	817	876	29.5	22.6					
23.	704	817	859	28.0	23.5					
24.	646	817	854	29.0	22.9					
25.	675	817	828	27.8	20.5					
26.	678	817	839	27.5	20.6					
27.	733	816	841	28.8	20.8					
28.	746	816	841	30.0	20.1					
29.	747	816	801	29.2	18.5					
30.	752	816	755	27.0	19.3					
31.										

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

ESSAR RANCH LAKE, SAN ANTONIO, TEX.—Continued										
1956—Continued										
August					September					
1.										
2.	616	783	811	27.5	19.6					
3.	671	782	794	27.8	20.0					
4.	707	780	803	28.8	18.8					
5.	719	778	797	29.8	17.0					
6.	667	776	834	29.5	19.4					
7.	665	774	833	29.2	21.6					
8.	679	772	832	29.5	21.5					
9.	706	770	811	29.2	21.7					
10.	710	768	785	29.2	21.7	619	681	720	25.5	14.3
11.						625	677	706	23.5	17.5
12.						611	674	724	25.8	21.7
13.						575	670	736	26.2	22.6
14.						626	666	738	26.5	20.8
15.						631	662	712	26.0	21.2
16.						612	658	702	25.5	20.9
17.						617	653	695	25.8	19.2
18.						592	650	739	27.5	16.1
19.						617	646	716	28.2	14.5
20.						614	642	701	28.5	16.9
21.										
22.										
23.										
24.										
25.										
26.										
27.										
28.										
29.										
30.										
31.										

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

ESSAR RANCH LAKE, SAN ANTONIO, TEX.—Continued										
1956—Continued										
October					December					
1.					389	395	539	14.7	6.5	
2.					388	393	539	15.4	4.3	
3.					369	391	571	16.8	14.0	
4.					184	389	697	19.4		
5.					191	387	746	20.9		
6.					150	386	778	23.4		
7.					132	384	811	24.6	22.0	
8.					226	382	739	19.7	22.0	
9.					245	380	572	6.6		
10.					355	379	627	8.2	2.7	
11.	427	562	726	21.7	16.2	330	378	598	15.1	
12.	412	558	778	23.0	20.6	295	377	701	19.3	
13.	387	554	801	23.7	22.5	357	376	511	9.6	6.2
14.	388	550	796	23.7	20.3	359	375	503	7.6	5.7
15.	286	546	761	21.0	21.1	354	374	559	11.1	
16.	475	543	758	21.3	18.9	211	374	658	11.4	
17.	424	539	614	20.5	18.4	160	374	769	22.6	
18.	156	535	762	20.0	20.1	68	374	646	12.2	
19.	487	531	773	22.1	19.4					
20.	373	527	738	21.7	18.1					
21.	527	524	666	20.0	9.9					
22.	517	521	608	18.9	8.1					
23.	509	517	625	18.5	9.7					
24.	385	513	686	20.5	16.0					
25.	288	509	766	21.5	16.0					
26.	496	505	671	19.4	6.0	355	373	506		
27.	413	500	726	19.8	9.6	383	373	478	10.4	4.6
28.	326	496	805	23.0	18.0	381	374	508	12.7	3.6
29.	405	492	793	24.1	21.7	353	374	551	12.8	6.0
30.	371	488	705	19.9	10.7	382	374	532	15.7	4.3
31.	488	484	571	17.4	7.2	384	374	530	14.6	5.4

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air vapor pressure (mb)
PIKES PEAK, COLORADO										
1956										
June						July				
1.....						408	872	590	6.4	6.9
2.....						458	871	518	7.8	7.4
3.....										
4.....						772	869	504	8.3	7.7
5.....						827	867	547	11.4	4.1
6.....						626	865	533	11.9	3.6
7.....						811	863	504	12.7	2.0
8.....						521	861	576	9.6	7.0
9.....						294	859	490	8.4	7.9
10.....						554	856	479	10.8	5.6
11.....						473	854	483	10.8	5.4
12.....						315	852	515	8.6	7.3
13.....						395	850	503	7.6	7.7
14.....						386	848	525	8.8	7.7
15.....	730	880	504	10.9	8.6	599	846	479	10.0	7.1
16.....	859	880	475	11.6	3.0	418	844	514	7.0	8.5
17.....	698	880	504	8.7	7.3	405	842	484	7.5	8.9
18.....	482	881	576	11.9	6.4	446	840	518	9.1	7.8
19.....	617	881	533	10.5	6.1	353	837	485	5.9	8.4
20.....	638	881	518	12.6	4.6	712	835	490	8.0	6.7
21.....	858	881	562	11.8	4.0	643	833	504	10.6	5.3
22.....	853	881	518	9.7	5.6	322	831	526	7.4	7.8
23.....	529	880	547	10.9	3.9	734	829	490	9.4	5.9
24.....	700	880	490	10.8	4.3	529	827	475	9.9	6.2
25.....	588	879	518	11.5	4.2	349	825	490	10.8	6.0
26.....	763	878	547	9.2	6.2	575	823	490	11.3	6.0
27.....	219	877	576	9.1	5.6	652	819	490	11.6	6.2
28.....						593	817	533	10.8	7.2
29.....	611	875	518	8.0	7.7	625	814	547	10.7	7.9
30.....	448	873	518	8.8	6.8	273	812	576	8.2	8.6
31.....						337	810	634	7.4	8.6
PIKES PEAK, COLORADO—Continued										
1956—Continued										
October										
1.....	471	554	418	4.2	4.3					
2.....	553	549	446	4.6	4.2					
3.....	262	544	448	3.7	5.1					
4.....	509	538	429	5.8	4.0					
5.....	390	533	459	7.7	4.3					
6.....	538	528	438	5.7	4.5					
7.....	389	523	465	7.6	4.7					
8.....	284	517	466	6.3	4.7					
9.....	316	512	448	3.9	4.6					
10.....	524	507	418	5.9	3.6					
11.....										
12.....										
13.....										
14.....										
15.....										
16.....										
17.....										
18.....										
19.....										
20.....										
21.....										
22.....										
23.....										
24.....										
25.....										
26.....										
27.....										
28.....										
29.....										
30.....										
31.....										
MOSS BLUFF, TEXAS										
1957										
March						April				
1.....						662	667	647	18.8	16.3
2.....						395	671	826	21.4	22.7
3.....						80	675	774	20.8	22.4
4.....						629	679	662	18.8	14.9
5.....						680	682	574	13.1	6.8
6.....						624	686	593	13.9	9.5
7.....						265	690	765	16.6	16.6
8.....						523	693	635	15.1	9.7
9.....						689	697	556	11.5	7.8
10.....						224	700	704	13.8	13.1
11.....						388	703	684	16.8	17.0
12.....						618	707	734	18.1	16.4
13.....	560	565	592	17.2	15.7	380	711	683	10.9	9.4
14.....	508	570	596	18.7	15.6	446	714	681	12.2	10.4
15.....	541	574	600	14.9	5.5	498	717	715	16.3	13.4
16.....	509	578	604	15.2	9.2	193	721	714	18.1	19.0
17.....		582	607	16.2	17.8	487	724	785	20.3	20.9
18.....	438	586	611	19.9	20.9	445	727	842	21.9	24.1
19.....	442	590	615	17.9	15.7	381	730	830	21.5	22.3
20.....	484	602	619	16.0	15.4	362	733	794	18.8	19.3
21.....	528	598	623	16.8	14.1	359	736	740	15.6	14.7
22.....	259	606	631	17.8	15.7	394	741	820	23.1	24.4
23.....	581	610	635	10.2	7.1	388	743	767	23.3	24.7
24.....	582	614	639	8.8	6.2	486	745	852	23.4	24.4
25.....	610	618	643	10.3	6.8	481	748	774	23.1	24.4
26.....	528	623	647	14.8	13.0	213	751	754	20.9	22.3
27.....	140	627	651	12.6	13.6	110	753	725	18.1	20.0
28.....	562	631	655	13.6	11.3	280	755	713	18.8	19.3
29.....	235	636	659	16.3	16.5	157	758	647	14.7	16.0
30.....	247	641	663	16.3	16.7					
31.....										
August						September				
1.....	258	807	619	8.3	8.9	709	704	419	8.1	3.1
2.....	287	805	533	7.4	8.4	680	700	455	9.6	3.7
3.....	629	801	504	9.0	6.8	614	695	467	8.2	2.8
4.....	731	799	475	9.3	5.8	683	691	441	10.3	4.5
5.....	769	796	461	11.1	4.5	689	687	508	7.0	5.6
6.....	660	793	490	11.2	5.1	689	683	459	7.3	5.2
7.....	552	791	504	10.9	5.9	547	677	467	8.5	4.0
8.....	437	788	475	9.5	4.5	355	673	490	8.3	4.8
9.....	594	785	520	11.1	7.8	491	669	507	9.1	5.6
10.....	629	782	484	10.4	6.1	583	664	504	10.3	5.5
11.....	471	779	528	9.3	7.6	587	659	490	11.4	5.0
12.....	423	776	567	9.6	7.5	608	654	477	12.0	3.9
13.....	337	773	541	8.9	8.0	505	650	523	11.7	4.2
14.....	527	770	569	10.4	7.5	563	644	458	11.1	3.8
15.....	629	766	539	11.9	7.3	661	639	422	10.5	2.7
16.....	358	763	547	9.3	8.2	628	634	439	9.4	2.6
17.....	368	749	518	8.3	8.3	640	629	452	7.3	5.2
18.....	266	757	536	5.5	7.4	633	623	439	9.8	3.0
19.....	208	754	546	3.6	7.7	595	618	452	8.7	4.3
20.....	458	766	481	4.9	7.2	611	613	459	10.5	3.1
21.....	584	747	445	6.5	5.2	347	607	443	5.2	4.7
22.....	499	744	461	7.6	5.6	391	602	527	3.4	6.0
23.....	469	740	504	9.3	5.1	617	597	560	3.7	5.6
24.....	404	737	461	7.8	5.7	613	591	426	7.1	3.0
25.....	346	732	480	7.3	5.7	466	586	449	6.0	3.5
26.....	441	728	460	7.6	5.7	391	581	432	6.1	5.0
27.....	713	725	446	9.1	4.0	550	576	446	8.3	3.1
28.....	426	721	475	7.4	4.8	509	570	446	7.3	4.0
29.....	401	717	484	5.9	5.6	577	565	403	5.2	4.5
30.....	620	717	505	8.3	3.7	468	560	446	6.6	4.3
31.....	548	708	438	3.0	5.6					

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

MOSS BLUFF, TEXAS—Continued										
1957—Continued										
May					June					
1	518	761	718	17.6	16.1	449	812	758	22.4	24.0
2	442	764	763	20.9	21.0	287	813	727	20.7	23.3
3	540	767	734	20.8	20.5	437	813	779	21.7	22.4
4	537	769	717	18.9	14.8	517	814	739	22.0	21.8
5	684	771	639	15.6	9.3	333	814	727	20.5	21.2
6	668	773	593	15.9	11.2	433	815	692	19.4	18.5
7	439	775	694	17.6	15.1	549	815	727	20.7	19.6
8	566	777	733	20.7	19.4	561	816	780	25.3	25.8
9	642	779	698	21.3	19.5	689	816	756	25.9	26.6
10	642	780	740	22.3	22.2	751	817	776	26.3	27.5
11	635	782	785	23.1	23.2	727	817	758	26.4	
12	433	784	803	24.6	25.7	711	817	764	26.3	
13	447	786	857	24.8	25.9	700	818	775	26.8	
14	607	788	831	25.0	26.2	742	818	770	26.8	
15	529	789	814	24.9	26.0	629	818	766	26.8	
16	647	791	747	25.5	25.0	583	818	784	26.2	
17	695	792	728	23.9	22.1	729	819	748	26.2	
18	420	794	737	20.7	20.6	395	819	764	25.1	
19	718	796	665	18.6	15.2	533	819	778	25.1	
20	583	797	770	22.2	22.5	403	819	742	25.1	
21	590	799	826	26.3	28.5	322	819	767	25.1	
22	528	801	802	26.1	28.1	371	819	808	25.7	
23	436	802	821	25.7	27.6	452	818	789	24.6	
24	505	804	814	25.9	27.5	695	818	754	24.0	
25	535	805	823	25.6	27.2	622	818	756	25.1	
26	512	806	797	24.4	23.9	446	818	769	23.5	
27	494	807	763	23.4	20.3	120	818	796	24.0	
28	677	808	787	23.3	17.0	623	817	793	26.2	25.0
29	734	809	707	22.8	17.3	616	817	807	26.8	25.4
30	478	810	725	22.9	22.7	681	817	752	26.8	25.4
31	285	811	755	22.3	24.2					

July					August					
1	709	817	773	26.8	25.4	452	786	840	27.3	28.5
2	730	817	803	27.4	27.8	641	784	814	27.6	28.4
3	697	817	776	27.4	27.7	661	783	794	26.7	25.8
4	700	817	795	27.1	27.9	700	781	781	28.4	29.3
5	725	816	780	28.2	27.8	617	779	799	27.9	
6	675	816	797	28.7	29.4					
7	566	815	767	26.3	24.3					
8	668	815	779	26.7	25.5					
9	682	815	805	28.0	26.6					
10	679	814	800	28.4	26.7					
11	655	813	832	28.6	27.5					
12	712	812	769	27.6	24.7					
13	588	811	784	25.9	25.4					
14	560	810	818	26.7	25.6					
15	661	809	786	26.4	25.1					
16	646	808	780	26.6	25.0					
17	469	807	800	25.8	27.3					
18	553	805	797	27.0	26.0					
19	502	803	809	25.8	27.2					
20	352	802	797	24.4	27.8					
21	110	801	748	23.5	26.9					
22	515	800	819	26.1	27.7					
23	575	799	806	26.4	26.7					
24	569	797	809	26.3	26.7					
25	355	796	817	25.6	26.6					
26	638	794	807	26.1	24.4					
27	701	793	788	27.0	24.0					
28	695	792	814	28.4	25.8					
29	674	790	823	27.9	26.2					
30	548	789	844	27.6	28.4					

HONEY CREEK, TEXAS										
1957										
September					October					
1					524	573	650	20.8	12.6	
2					513	568	672	22.4	13.1	
3					494	564	701	23.3	12.7	
4					475	560	735	24.7	22.4	
5					490	556	737	24.3	19.4	
6					434	551	731	23.1	18.1	
7					358	547	737	22.2	17.3	
8					280	543	761	21.2	20.1	
9					185	538	767	18.8	19.0	
10					158	534	744	16.6	15.8	
11					337	529	726	18.5	15.9	
12					412	525	726	20.0	13.3	
13					24	520	724	16.5	15.6	
14					44	516	788	18.8	20.6	
15					122	512	782	18.4	21.0	
16					327	508	768	20.6	19.7	
17					469	504	684	18.9	19.2	
18					469	500	281	15.8	11.7	
19					455	496	592	13.6	9.5	
20	413	621	858	29.4	24.5	435	491	631	13.0	9.9
21	218	617	768	26.4	28.2	229	487	740	17.5	14.7
22	163	612	666	20.5	19.6	89	483	723	20.1	22.9
23	459	608	651	19.0	14.6	424	479	638	18.7	12.9
24	450	603	669	19.6	15.8	116	474	717	13.6	11.9
25	385	599	746	20.2	16.5	89	469	692	9.1	8.8
26	535	595	745	22.8	18.1	462	465	519	5.3	6.2
27	503	590	712	22.4	18.1	453	462	453	4.5	6.2
28	472	586	698	24.2	15.6	452	458	503	7.7	6.5
29	525	581	650	20.6	14.5	263	454	657	14.2	13.7
30	541	577	620	19.8	12.5	420	450	651	19.0	17.1
31						366	445	677	18.9	17.0

November					December					
1	172	441	776	20.6	21.9	352	350	429	8.9	5.5
2	218	437	704	18.3	17.0	223	348	552	13.3	10.1
3	103	433	718	12.3	11.2	316	346	543	10.7	7.4
4	27	429	651	11.9	13.8	334	344	507	11.3	6.3
5	27	425	595	11.7	13.4	320	342	551	13.1	7.7
6	75	422	728	13.1	14.8	42	341	636	15.5	14.9
7	121	418	663	14.5	15.0	329	339	524	9.0	8.2
8	401	414	515	11.1	8.4	329	337	477	7.5	5.5
9	404	410	522	9.3	7.6	312	336	493	7.3	6.0
10	204	407	601	8.5	7.9	328	335	482	8.0	5.8
11	283	404	677	10.3	9.4	340	334	371	-1.4	5.3
12	53	400	649	10.1	10.2	329	333	471	3.4	5.5
13	104	397	713	13.0	14.1	314	332	537	9.8	8.5
14	297	394	597	13.2	13.2	272	331	651	14.9	13.9
15	305	391	630	17.4	12.9	203	330	727	17.8	17.0
16	248	388	724	17.5	15.2	110	329	755	19.2	18.7
17	151	385	779	18.1	18.5	91	329	746	18.2	18.6
18	129	382	588	7.3	8.1	284	328	680	17.6	13.0
19	357	379	498	7.7	7.9	254	328	690	16.4	9.5
20	345	376	524	9.8	7.9	327	328	496	11.1	5.6
21	280	374	554	8.5	5.7	295	327	524	11.0	6.5
22	52	371	522	3.2	6.6	262	327	600	13.3	10.3
23	186	368	628	5.2	6.3	116	327	773	16.7	16.1
24	94	365	493	5.7	7.9	70	327	659	12.6	13.3
25	347	363	534	10.2	9.0	296	327	521	11.4	10.9
26	343	361	557	13.6	10.1	316	327	506	10.3	7.6
27	284	358	586	13.7	11.7	109	328	616	10.6	9.3
28	342	356	511	8.5	7.5	317	328	495	8.0	6.6
29	286	354	506	6.8	6.8	304	329	525	8.6	7.7
30	352	352	438	6.0	4.9	65	329	682	11.8	13.5
31						302	330	556	6.9	7.2

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)
HONEY CREEK, TEXAS—Continued										
1958										
January					February					
1	335	331	441	3.9	5.2	402	403	474	8.2	6.2
2	331	332	468	6.1	5.0	409	406	454	6.6	6.0
3	281	333	501	5.7	5.5	400	408	489	4.0	5.0
4	264	335	563	6.6	4.9	126	414	717	12.4	11.3
5	171	337	624	6.7	5.7	281	417	679	17.4	16.0
6	213	338	533	6.9	6.2	262	421	588	7.4	8.1
7	345	339	422	1.9	5.9	432	425	450	1.2	4.9
8	344	341	439	1.6	4.2	410	429	511	4.4	5.1
9	302	343	523	7.8	6.2	59	433	568	3.6	5.7
10	323	345	568	10.0	8.8	40	437	618	1.2	6.2
11	98	347	680	11.7	12.4	146	441	614	—8	3.9
12	64	349	627	12.6	14.3	438	445	483	—2.4	3.3
13	193	351	673	11.4	12.1	428	449	500	0	4.0
14	128	353	667	9.9	11.1	62	453	563	3.9	6.9
15	146	355	558	4.2	7.1	277	457	496	—4	4.2
16	341	357	498	7.4	7.7	404	461	536	—8	4.5
17	325	359	521	10.1	8.0	325	465	581	2.2	4.8
18	268	361	566	7.7	8.0	92	469	673	3.4	5.7
19	28	363	668	8.8	10.2	96	474	699	6.2	6.2
20	52	366	619	5.9	8.9	124	478	709	7.4	6.4
21	368	369	549	4.2	6.7	260	483	688	10.8	6.5
22	309	372	541	6.2	6.9	251	487	699	12.4	10.7
23	198	375	549	7.0	7.0	407	491	636	14.3	13.3
24	381	378	483	5.8	7.0	446	496	620	12.8	13.6
25	256	381	583	10.2	8.4	379	500	686	15.8	14.1
26	374	384	507	9.4	6.9	287	504	668	15.6	12.0
27	294	387	615	9.0	7.4	505	508	537	12.8	5.5
28	283	390	594	10.8	6.2	518	512	486	9.2	5.8
29										
30										
31	391	400	537	11.0	6.6					
March					April					
1	106	517	576	4.3	6.2	540	651	682	17.4	14.4
2	341	521	634	7.8	6.9	326	655	733	18.8	16.3
3	253	526	616	8.4	8.1	398	659	710	18.5	12.5
4	165	530	599	4.6	9.2	469	663	687	18.2	7.6
5	121	534	698	10.6	11.5	540	668	669	17.8	5.8
6	69	539	728	12.3	13.9	648	672	555	14.9	8.0
7	465	543	672	15.8	13.8	661	676	523	11.9	7.5
8	388	548	659	11.7	10.7	381	680	642	12.0	9.4
9	264	552	598	7.7	8.6	409	684	723	13.6	13.1
10	182	556	633	9.5	9.9	251	688	669	10.7	10.0
11	355	561	648	7.4	7.1	628	692	573	11.9	8.8
12	76	565	606	5.0	7.1	430	696	675	14.7	9.3
13	167	570	609	4.6	6.7	95	700	659	13.2	13.1
14	567	574	475	5.4	6.4	379	703	630	13.6	12.7
15	459	579	599	8.3	7.0	680	706	584	15.8	11.3
16	299	583	659	11.3	4.4	689	710	634	17.5	11.7
17	164	587	615	7.3	8.4	313	714	685	16.8	14.1
18	277	592	594	4.5	6.0	235	718	723	15.6	15.5
19	584	596	554	7.9	6.5	300	721	766	18.3	18.2
20	536	600	534	10.4	6.9	517	724	701	18.8	15.7
21	443	604	609	13.9	9.4	227	728	693	17.3	15.2
22	195	608	729	17.5	15.9	647	731	706	18.8	15.0
23	293	612	709	13.7	13.1	591	733	793	25.5	24.1
24	238	617	623	9.3	8.5	284	736	740	16.6	11.7
25	118	621	663	8.9	9.1	316	739	787	16.8	13.8
26	468	625	641	11.6	9.3	78	742	753	15.8	16.9
27	155	629	683	10.2	10.4	185	745	813	18.4	19.4
28	367	634	732	14.8	12.3	109	748	798	20.4	22.3
29	589	638	633	14.0	12.2	146	751	726	14.1	13.6
30	233	642	662	10.5	9.9	29	754	735	11.2	11.8
31	612	647	610	11.9	10.2					
HONEY CREEK, TEXAS—Continued										
1958—Continued										
May					June					
1	170	757	763	15.4	16.4					
2	63	760	836	19.6	21.8					
3	366	763	737	19.6	20.4					
4	544	766	731	19.6	17.8					
5	591	769	700	17.6	15.0					
6	697	771	666	19.4	14.4	592	818	852	26.7	23.3
7	674	773	690	21.0	16.0	609	819	858	27.9	25.0
8	331	775	752	21.9	18.9	722	819	811	28.5	24.4
9	364	777	782	20.1	19.0	706	820	810	29.3	24.9
10	628	778	747	21.4	17.3	659	820	834	30.0	27.3
11	695	780	737	22.8	17.1	707	820	818	30.2	25.8
12	665	782	715	23.2	16.8	714	821	828	29.6	29.2
13	382	784	781	22.7	18.8	737	821	797	29.1	24.7
14	293	786	732	22.4	22.2	701	822	835	29.2	24.4
15	454	788	783	23.4	21.8	323	822	879	28.7	30.7
16	650	790	764	23.6	19.2	320	822	803	23.2	25.4
17	686	792	736	23.1	18.7	412	823	850	24.2	24.9
18	507	794	769	23.4	18.8	545	823	867	27.2	27.4
19	571	796	742	22.8	19.6	420	824	844	28.0	28.4
20	745	797	714	22.7	15.6	479	824	841	26.9	28.9
21	747	799	696	23.0	14.1	256	824	827	23.5	26.3
22	721	801	712	24.4	17.2	319	824	761	21.4	22.2
23	721	803	769	26.4	20.4	615	824	723	24.4	20.1
24	626	804	795	27.3	22.0	685	824	775	26.9	23.1
25	553	805	763	24.8	24.2	283	823	797	23.1	22.6
26	721	807	763	27.0	20.9	738	823	637	19.8	15.0
27	657	808	823	29.0	23.8	749	822	665	22.1	16.0
28	564	809	821	27.2	25.0	726	822	695	22.7	18.1
29						668	822	734	24.9	21.9
30						587	821	812	26.9	27.6
31										
July					August					
1	620	821	785	27.6	26.9	694	784	793	32.7	28.4
2	706	820	763	27.7	24.7	473	782	877	32.2	28.7
3	631	820	763	28.0	24.3	673	780	856	31.7	27.7
4	583	819	767	26.9	24.5	668	778	853	31.6	27.6
5	277	818	740	22.0	24.0	659	776	852	31.4	27.2
6	142	817	796	22.0	25.1	547	774	844	31.6	27.6
7	458	816	799	23.2	23.4	614	772	849	31.6	26.3
8	655	815	744	23.2	21.0	445	770	869	29.7	27.0
9	718	814	814	27.5	24.1	415	768	793	26.2	18.7
10	612	813	859	28.7	26.5	650	766	840	28.8	22.6
11	716	812	816	29.4	25.2	566	763	820	28.6	22.2
12	673	811	830	29.8	24.9	592	760	819	29.2	23.2
13	708	810	871	30.0	24.8	598	757	838	31.4	24.6
14	548	808	885	30.2	25.4	644	755	842	30.8	25.0
15	709	807	818	30.9	26.5	641	752	837	31.4	28.0
16	697	806	804	31.0	21.7	590	749	838	30.6	27.5
17	707	805	829	30.8	25.3	464	746	872	28.0	26.4
18	620	804	877	30.8	26.0	383	743	851	26.4	25.5
19	712	803	773	31.6	22.1	577	740	841	28.0	25.7
20	635	802	829	31.0	24.9	497	737	783	27.5	27.5
21	500	801	868	28.8	22.3	179	734	833	24.9	28.7
22	618	800	857	29.9	24.4	436	731	856	25.9	27.1
23	529	799	826	27.5	20.6	488	727	844	27.0	26.1
24	688	798	832	30.6	25.6	520	724	805	26.6	22.9
25	613	797	851	31.8	27.9	649				

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

HONEY CREEK, TEXAS—Continued

1958—Continued

September						October					
1	580	696	796	29.8	24.0	518	573	625	13.9	10.4	
2	613	692	738	29.0	22.5	484	568	634	14.0	12.3	
3	566	688	766	28.0	22.2	82	564	627	12.2	13.0	
4	574	684	783	28.2	21.9	109	560	731	13.8	14.8	
5	446	680	824	26.8	22.8	144	556	741	16.6	17.2	
6	313	676	853	26.3	25.1	310	551	732	19.5	15.9	
7	248	672	846	25.8	25.2	206	547	801	22.0	18.3	
8	358	668	806	24.4	24.2	333	543	809	24.5	24.3	
9	325	664	836	26.3	25.1	439	538	752	24.5	27.7	
10	321	660	793	25.2	25.6	194	534	791	18.7	24.3	
11	524	657	757	25.1	24.4	107	529	757	15.7	22.5	
12	424	653	787	23.5	20.4	494	525	680	16.8	19.0	
13	568	649	712	23.3	18.6	451	520	651	16.8	15.9	
14	371	645	781	24.0	22.0	196	516	727	17.4	13.7	
15	427	641	805	26.2	22.8	287	512	768	18.9	19.0	
16	201	638	799	24.1	25.8	442	508	689	19.0	20.4	
17	557	634	726	20.3	16.3	433	504	647	18.7		
18	253	630	832	21.3	20.9	422	500	633	20.5	19.6	
19	74	626	760	21.4	24.6	470	496	620	21.3	17.0	
20	325	621	836	23.5	25.0	468	491	626	20.8	17.7	
21	334	617	819	24.0	24.9						
22	223	612	856	23.8	26.3						
23	344	608	825	26.6	28.1						
24	533	603	763	27.1	26.5						
25	434	599	800	26.5	25.7						
26	310	595	790	24.8	25.5						
27	496	590	716	22.3	17.4						
28	550	586	620	18.2	11.0	313	458	559	8.1	4.8	
29	428	581	694	19.2	14.1	147	454	611	8.6	5.9	
30	69	577	749	17.1	15.3	364	450	649	11.1	6.8	
31						213	445	588	9.2	7.5	

November						December					
1	413	441	467	8.0	5.8						
2	421	437	463	9.6	5.8						
3	359	433	580	14.8	8.8						
4	384	429	611	16.1	13.3						
5	213	425	623	16.1	11.6						
6	360	422	520	11.2	5.0						
7	397	418	511	11.9	7.6						
8	399	414	540	14.6	8.7						
9	398	410	529	16.3	7.4						
10	384	407	534	15.7	6.0						
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

SAN VICENTE, CALIF.

1957

September						October					
1						566	573	599	19.5	12.4	
2						538	568	706	17.8	13.5	
3						361	564	733	17.2	13.9	
4						527	560	646	18.0	13.0	
5						530	556	598	17.0	12.3	
6						532	551	574	16.5	13.5	
7						524	547	573	17.5	11.7	
8						520	543	570	19.0	11.1	
9						515	538	570	18.8	12.4	
10						515	534	570	17.8	13.8	
11						225	529	575	16.0	14.3	
12						290	525	570	15.2	14.3	
13						150	520	600	15.0	15.3	
14						305	516	670	16.8	15.8	
15						200	512	650	16.5	15.7	
16						447	508	645	18.2	14.9	
17						407	504	722	16.2	17.1	
18						57	500	744	16.2	17.0	
19						116	496	765	16.5	15.7	
20	436	696	749	19.5	15.0	200	491	721	14.5	11.6	
21	571	692	659	20.0	15.2	317	487	640	13.5	11.5	
22	589	688	624	22.5	12.5	433	483	580	14.8	10.9	
23	566	684	671	22.5	13.0	462	479	582	16.8	10.9	
24	537	680	707	23.2	14.4	451	474	591	17.5	11.3	
25	544	676	688	17.0	16.0	439	469	620	19.8	10.9	
26	566	672	659	21.0	15.8	203	465	698	19.0	12.4	
27	569	668	643	22.0	12.8	362	462	648	18.2	15.0	
28	510	664	697	24.2	12.8	130	458	677	16.0	15.5	
29	546	660	689	23.8	13.4	414	454	651	18.2	13.2	
30	548	657	657	21.8	14.7	90	450	712	17.5	14.6	
31						182	445	721	15.8	16.2	

November						December					
1	193	441	716	15.7	14.0	330	350	490	16.7		
2	173	437	719	13.2	12.4	294	348	496	15.2		
3	298	433	580	9.5	10.3	356	346	508	16.2		
4	220	429	633	11.2	10.4	80	344	688	14.5	7.7	
5	186	425	617	12.0	10.6	174	342	581	11.5	11.5	
6	407	422	521	12.0	8.8	333	341	554	13.2	10.9	
7	406	418	529	13.0	9.2	335	339	543	15.2	8.2	
8	402	414	542	14.0	10.4	332	337	575	15.8	8.5	
9	390	410	545	14.5	10.9	327	336	590	17.8	7.5	
10	383	407	637	16.0	10.9	324	335	575	17.0	8.4	
11	398	404	637	14.5	11.3	329	334	568	17.0	7.7	
12	378	400	568	13.0	11.2	320	333	570	17.0	7.4	
13	349	397	464	13.0	12.8	260	332	581	15.2	7.4	
14	202	394	640	12.0	13.9	158	331	692	15.8	9.2	
15	207	391	681	12.0	12.3	59	330	793	16.5	15.2	
16	146	388	662	9.1	8.8	154	329	781	16.0	16.0	
17	394	385	563	9.0	9.2	244	329	677	14.2	13.4	
18	382	382	528	11.0	8.0	152	328	682	12.2		
19	362	379	570	13.5	8.2	311	328	568	13.8	10.5	
20	377	376	580	17.0	9.6	315	328	552	13.8	8.7	
21	362	374	541	16.5		304	327	616	12.8	10.4	
22	391	371	461	13.5		248	327	611	13.2	11.7	
23	359	368	525	13.0		289	327	586	12.8	11.5	
24	367	365	602	17.0		313	327	524	13.0	9.6	
25	371	363	538	17.0	8.6	325	327	520	14.8	5.9	
26	356	361	530	15.0	7.6	342	327	612	14.8	8.0	
27	349	358	535	13.5	8.6	306	328	547	13.5	9.9	
28	346	356	542	15.0	7.6	302	328	542	13.2	9.1	
29	362	354	482	14.0		321	329	544	11.8	10.3	
30	365	352	485	18.2		330	329	560	15.0	8.2	
31						323	330	538	13.8	8.0	

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)
SAN VICENTE, CALIF.—Continued										
1958										
	January					February				
1	314	331	532	12.5	7.0	305	403	569	17.5	4.6
2	312	332	533	11.8	9.3	328	406	639	14.0	9.4
3	323	333	515	12.5	8.8	134	408	649	13.5	13.8
4	329	335	496	13.2	7.7	96	414	631	12.8	12.8
5	340	337	530	18.0	7.1	299	417	604	13.0	12.6
6	259	338	562	17.0	7.7	327	421	571	12.8	11.2
7	344	339	561	17.5	13.6	394	425	606	14.0	11.2
8	328	341	531	15.5	8.7	266	429	693	13.2	10.9
9	252	343	587	14.2	7.5	385	433	642	14.5	10.9
10	246	345	646	13.2	10.2	343	437	599	13.0	11.8
11	331	347	534	12.5	9.4	419	441	588	13.5	12.3
12	259	349	540	12.0	8.1	277	445	745	13.5	12.7
13	280	351	569	12.2	9.3	369	449	625	14.0	13.1
14	355	353	509	13.0	6.2	398	453	564	12.8	11.2
15	365	355	515	14.8	4.9	398	457	565	13.8	12.0
16	310	357	523	14.8	4.7	461	461	596	16.5	11.4
17	298	359	541	13.8	4.9	463	465	592	15.8	11.3
18	363	361	518	14.0	5.2	286	469	667	13.0	12.1
19	376	363	505	12.8	4.8	78	474	665	12.5	12.9
20	384	366	509	12.8	4.4	439	478	607	14.0	10.4
21	305	369	537	10.0	6.8	468	483	588	16.0	10.6
22	388	372	487	10.5	5.9	423	487	610	14.2	12.6
23	386	375	492	11.5	4.8	465	491	677	14.8	12.2
24	163	378	638	10.0	8.3	436	496	714	16.2	16.6
25	149	381	687	12.2	13.9	514	500	523	12.0	8.5
26	218	384	615	12.5	13.4	510	504	530	19.8	8.2
27	328	387	608	13.8	12.5					
28	335	390	594	14.0	10.9					
29	389	393	619	13.5	11.2					
30	228	397	629	12.8	11.2					
31	290	400	587	14.8	7.5					
	March					April				
1	421	517	587	11.5	6.2	76	651	638	10.5	12.1
2	278	521	589	9.8	7.3	304	655	625	11.2	10.1
3	414	526	590	11.0	7.7	165	659	592	10.4	13.3
4	539	530	515	12.5	7.1	491	663	509	11.0	8.8
5	547	534	505	13.2	6.0	650	668	490	13.0	8.6
6	54	539	553	8.0	9.1	439	672	527	11.4	9.0
7	446	543	537	9.5	7.7	158	676	637	9.8	8.1
8	314	548	664	12.0	9.3	526	680	584	13.6	10.0
9	518	552	581	13.5	8.3	658	684	569	16.5	10.4
10	519	556	618	12.2	6.9	654	688	586	20.2	8.8
11	290	561	606	9.2	8.9	660	692	597	19.7	10.0
12	260	565	565	8.8	9.1	690	696	589	20.6	7.8
13	465	570	524	11.5	8.8	676	700	584	19.1	7.7
14	503	574	579	12.5	8.1	687	703	571	20.3	6.8
15	157	579	695	12.5	10.2	695	706	592	23.1	6.7
16	145	583	691	12.8	14.1	666	710	662	18.7	13.0
17	359	587	692	14.2	12.2	620	714	763	20.0	13.6
18	548	592	611	15.1	10.2	656	718	719	18.8	14.0
19	593	596	619	12.6	13.9	680	721	734	22.2	15.5
20	212	600	622	14.1	10.9	699	724	664	27.4	11.1
21	272	604	684	13.6	12.5	713	728	618	25.1	10.7
22	486	608	655	14.4	11.4	610	731	728	18.1	13.6
23	544	612	578	14.0	8.4	565	733	686	19.3	11.3
24	514	617	638	13.8	10.9	692	736	538	15.4	8.8
25	481	621	649	13.8	9.7	728	739	542	14.9	10.0
26	437	625	698	14.4	10.7	676	742	578	15.9	10.8
27	164	629	667	11.0	10.6	717	745	575	15.9	10.9
28	367	634	649	13.1	10.0	658	748	606	15.8	11.6
29	500	638	596	14.3	10.3	499	751	652	16.2	11.7
30	480	642	634	14.2	9.6	203	754	720	15.1	12.0
31	397	647	692	14.2	10.7					

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)
SAN VICENTE, CALIF.—Continued										
1958—Continued										
	May					June				
1	232	757	765	15.6	12.9	689	814	722	17.8	14.2
2	332	760	772	16.2	13.5	755	815	706	18.6	14.2
3	701	763	671	19.2	13.9	769	815	659	19.0	14.1
4	716	766	665	21.0	12.8	767	817	584	17.7	14.3
5	716	769	669	20.0	10.2	719	817	705	17.8	13.1
6	644	771	757	17.2	12.5	778	817	686	14.5	13.9
7	415	773	756	16.0	11.0	783	819	601	17.5	15.0
8	583	775	755	17.5	11.1	728	819	611	18.0	14.6
9	267	777	757	16.7	12.7	761	820	638	17.8	15.2
10	344	778	708	17.0	12.6	737	820	727	18.1	13.6
11	416	780	652	15.2	12.6	674	820	725	17.4	14.8
12	618	782	625	17.0	11.9	760	820	707	18.8	14.5
13	630	784	621	15.8	12.0	775	820	643	19.4	13.0
14	645	786	616	17.0	13.1	766	822	607	20.2	14.6
15	662	788	612	20.3	12.5	654	822	714	20.4	14.4
16	727	790	676	20.1	13.7	593	822	742	20.6	15.7
17	727	792	718	17.6	15.9	709	823	715	20.8	15.6
18	754	794	691	18.1	13.9	758	823	679	21.2	15.3
19	737	796	639	17.4	14.1	763	823	623	20.2	16.0
20	554	797	743	17.6	17.5	755	823	656	20.2	14.9
21	720	799	725	17.9	16.9	623	824	721	21.0	16.3
22	737	801	653	19.5	14.1	752	824	694	23.0	15.1
23	739	803	674	20.4	15.0	766	824	675	22.1	14.7
24	735	804	658	18.6	15.3	766	824	700	20.6	15.9
25	752	805	658	18.4	15.2	745	824	720	20.8	16.0
26	751	807	641	18.9	13.1	700	824	715	20.0	16.7
27	581	808	655	18.9	12.8	751	822	643	21.4	16.2
28	761	809	626	20.1	13.7	733	822	704	21.2	16.8
29	559	810	702	19.0	15.9	718	822	701	19.4	15.6
30	745	811	724	18.0	14.8	796	822	697	19.7	14.2
31	749	813	679	18.3	13.0					
	July					August				
1	780	821	697	19.3	14.8	679	784	732	23.2	18.4
2	717	820	708	18.9	14.9	708	782	740	24.4	17.9
3	710	820	711	19.8	15.7	697	789	720	22.8	17.5
4	735	819	730	19.8	15.9	676	778	727	21.6	18.0
5	744	818	717	20.4	15.5	673	776	749	22.0	18.6
6	698	817	735	20.6	16.3	653	774	734	21.9	17.7
7	745	816	733	22.8	16.0	647	772	722	21.2	17.8
8	760	815	707	25.1	13.6	664	777	736	23.1	15.6
9	743	814	737	25.8	13.7	670	768	759	26.0	15.0
10	724	813	703	26.7	14.9	665	766	742	26.0	15.4
11	726	812	694	23.7	16.9	595	763	757	24.2	18.1
12	710	811	692	21.5	15.7	628	760	766	24.4	18.4
13	725	810	722	20.8	17.3	433	757	801	25.5	18.1
14	703	808	723	19.8	16.1	569	755	801	24.8	19.6
15	741	807	696	21.0	16.1					

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

SAN VICENTE, CALIF.—Continued

1958—Continued

September					October					
1	593	696	706	22.2	18.3	375	573	704	25.0	15.6
2	563	692	734	21.7	18.2	541	568	682	29.2	10.1
3	568	688	739	22.1	17.9	444	564	665	29.2	8.2
4	617	684	697	22.6	17.1	521	560	668	28.5	8.4
5	586	680	748	25.0	16.9	521	556	726	21.0	17.1
6	575	676	780	28.5	17.3	359	551	710	20.6	17.2
7	490	672	788	27.6	18.0	475	547	695	20.2	15.2
8	604	668	750	27.1	18.7	495	543	698	20.6	16.7
9	612	664	716	26.6	14.8	432	538	697	19.3	16.9
10	626	660	651	23.8	14.9	454	534	721	19.3	16.4
11	634	657	663	28.6	10.8	473	529	641	19.9	16.2
12	572	653	695	20.5	16.4	470	525	682	21.7	15.7
13	605	649	672	20.0	14.3	479	520	686	28.7	11.2
14	625	645	647	23.2	13.8	486	516	680	28.4	10.8
15	592	641	647	26.9	8.7	482	512	684	30.4	9.1
16	608	638	652	28.2	8.3	500	508	652	31.6	6.2
17	587	634	649	27.0	8.9	487	504	649	29.8	5.7
18	610	630	636	25.7	10.8	462	500	625	27.0	7.5
19	587	626	676	27.3	10.6	476	496	677	21.4	13.5
20	586	621	654	26.7	9.4	477	491	693	18.7	15.3
21	577	617	668	21.9	14.7	464	487	685	19.4	15.1
22	301	612	703	18.6	16.5	449	483	678	19.3	14.3
23	124	608	677	18.0	15.8	145	479	708	17.1	14.3
24	538	603	690	20.0	16.9	256	474	709	16.6	13.8
25	603	599	596	22.3	7.9	456	469	637	16.9	13.2
26	577	595	622	25.6	6.2	429	465	655	17.5	13.6
27	541	590	673	26.2	10.1	385	462	651	18.0	14.5
28	431	586	712	24.4	13.0	423	458	587	19.3	14.0
29	538	581	688	23.2	15.0	442	454	551	21.9	7.1
30	526	577	709	22.9	17.0	446	450	563	21.4	7.2
31						308	445	585	19.2	7.4

SAN VICENTE, CALIF.—Continued

1959

January					February					
1	329	331	609	14.4	8.1	424	403	563	11.0	5.6
2	202	332	692	13.6	10.6	419	406	549	12.0	6.5
3	283	333	606	12.7	9.7	413	408	496	11.1	5.5
4	337	335	601	12.1	8.1	421	414	550	11.1	7.4
5	121	337	664	12.0	9.1	415	417	544	12.1	9.3
6	214	338	653	13.4	11.4	415	421	620	12.1	10.1
7	319	339	590	13.5	9.6	158	425	721	11.0	11.6
8	331	341	607	14.4	9.7	111	429	638	9.8	11.3
9	302	343	610	14.7	9.2	438	433	547	9.7	7.5
10	241	345	632	14.9	9.5	404	437	638	10.8	8.8
11	335	347	600	17.8	10.2	85	441	686	11.2	11.5
12	280	349	578	17.0	10.8	377	445	554	10.2	9.4
13	336	351	580	13.8	11.5	463	449	506	10.7	7.3
14	352	353	577	14.7	9.8	435	453	502	10.7	5.9
15	355	355	579	17.0	8.1	180	457	628	13.4	5.9
16	324	357	593	18.4	7.1	125	461	721	14.0	15.0
17	359	359	592	19.4	6.9	251	465	709	14.0	13.8
18	300	361	619	16.4	9.0	388	469	658	13.8	10.6
19	211	363	690	11.1	11.0	421	474	635	13.2	11.4
20	262	366	678	14.2	9.4	443	478	606	11.7	9.5
21	356	369	515	14.0	3.0	131	483	611	9.0	9.2
22	368	372	545	13.5	5.3	340	487	539	9.5	9.0
23	385	375	550	14.5	12.2	505	491	562	11.1	8.4
24	381	378	544	14.2	9.3	507	496	526	13.6	7.6
25	382	381	572	12.1	9.5	519	500	521	14.7	5.8
26	340	384	588	14.2	11.4	516	504	518	15.6	5.0
27	394	387	572	15.8	5.3	519	508	556	16.8	7.0
28	398	390	535	13.8	7.5	521	512	525	16.6	7.7
29	356	393	557	14.6	7.5					
30	393	397	535	11.8	8.3					
31	421	400	547	12.2	6.4					

November					December					
1	406	441	547	18.6	6.9	353	350	493	15.9	
2	437	437	566	19.8	6.2	349	348	551	18.1	
3	429	433	565	20.8	5.8	338	346	548	20.2	
4	412	429	580	20.0	7.4					
5	403	425	605	20.2	9.0					
6	402	422	608	19.0	11.4	315	341	571	13.0	
7	388	418	631	17.3	13.1	326	339	508	13.7	
8	377	414	611	16.7	14.1	295	337	575	13.6	
9	388	410	637	15.7	13.2	305	336	572	14.8	
10	138	407	739	15.7	14.0	319	335	577	20.0	
11	214	404	665	13.2	11.4	321	334	592	21.2	
12	248	400	646	14.9	11.7	310	333	601	19.4	
13	386	397	565	15.4	11.2	305	332	585	17.8	
14	342	394	689	14.6		323	331	547	20.2	
15	299	391	633	12.3	7.5	315	330	506	21.0	
16	401	388	429	8.0	5.7	340	329	490	18.7	
17	400	385	475	9.4	4.8	334	329	498	18.0	
18	394	382	490	12.5		325	328	496	16.9	
19	391	379	521	14.9		302	328	521	13.8	
20	371	376	550	16.5		311	328	519	14.9	
21	362	374	608	17.8		266	327	576	14.2	
22	387	371	574	17.8						
23	379	368	565	17.4		295	327	580	13.4	10.9
24	286	365	683	17.4		313	327	523	12.1	9.4
25	199	363	699	16.8		322	327	536	12.3	10.5
26	145	361	652	15.2		313	327	572	12.8	10.6
27	325	358	575	14.7		297	328	587	14.0	12.1
28	359	356	495	16.4		321	328	583	14.4	12.5
29	362	354	494	17.5		343	329	504	16.4	6.9
30	355	352	496	16.8		346	329	495	15.2	5.1
31						338	330	525	15.8	5.4

March					April					
1	520	517	605	18.8	7.4	657	651	605	22.4	11.0
2	458	521	610	17.8	10.2	647	655	602	21.6	11.0
3						528	659	627	19.7	11.6
4	542	530		18.7	11.6	406	663	643	17.9	12.9
5	541	534	525	18.0	12.0	379	668	670	14.8	13.3
6	550	539	535	15.0	11.8	222	672	727	13.8	13.0
7	508	543	595	12.8	11.2	221	676	737	14.7	13.4
8	554	548	566	15.6	11.5	566	680	735	17.1	13.6
9	495	552	594	17.5	9.2	655	684	734	17.4	14.1
10	560	556	592	18.2	9.2	654	688	619	19.3	12.0
11	563	561	551	20.3	6.5	700	692	563	19.8	10.4
12	562	565	495	19.7	5.3	698	696	554	17.0	6.3
13	572	570	644	15.6	9.4	691	700	659	19.0	12.9
14	524	574	666	15.8	12.7	656	703	688	16.2	13.3
15	601	579	548	18.4	7.0	651	706	706	14.6	10.8
16	602	583	525	19.0	5.0	576	710	725	15.0	11.0
17	465	587	545	18.1	8.8	280	714	735	14.5	11.3
18	595	592	630	14.6	10.1	307	718	723	14.1	11.1
19	563	596	667	16.1	9.9	283				

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)

SAN VICENTE, CALIF.—Continued										
1959—Continued										
	May					June				
1.....	214	757	763	16.1	13.8	751	814	671	20.2	16.0
2.....	584	760	627	13.6	9.5	727	815	640	19.8	15.5
3.....	763	766	627	12.0	9.5	706	816	696	19.0	15.5
4.....	720	766	627	14.0	9.5	679	817	712	19.1	15.3
5.....	758	769	545	17.8	8.7	689	818	698	18.5	15.7
6.....	752	771	605	17.0	12.0	632	818	729	19.0	15.9
7.....	737	773	602	18.6	13.3	728	819	684	18.7	14.6
8.....	530	775	744	15.3	12.2	773	819	720	18.3	14.7
9.....	700	777	693	16.8	12.7	732	820	667	18.0	14.9
10.....	655	778	724	17.4	13.9	759	820	680	18.2	15.3
11.....	577	780	686	17.1	13.9	760	820	644	19.2	16.1
12.....	626	782	646	18.4	13.8	716	821	666	20.0	17.4
13.....	740	784	704	18.8	14.2	703	821	715	21.8	18.5
14.....	567	786	721	17.4	14.1	728	822	685	22.6	17.2
15.....	716	788	679	17.5	13.7	761	822	610	21.0	16.6
16.....	670	790	735	17.2	13.7	789	822	690	21.5	16.5
17.....	654	792	750	16.8	13.2	788	823	586	22.0	14.2
18.....	610	794	671	16.7	13.2	791	823	611	22.5	14.5
19.....	654	796	664	16.0	13.2	740	824	643	21.3	16.8
20.....	666	797	746	16.4	13.4	743	824	668	23.4	17.9
21.....	392	799	748	15.6	10.9	740	824	707	25.1	17.6
22.....	634	801	746	16.5	10.9	733	824	684	25.0	17.6
23.....	278	803	719	15.2	11.0	751	824	682	23.0	18.9
24.....	448	804	736	16.1	12.9	742	824	701	20.5	16.9
25.....	583	805	775	17.3	13.5	724	823	754	19.2	16.1
26.....	695	807	671	17.3	13.1	707	823	792	19.8	16.1
27.....	755	808	677	17.1	13.0	694	822	821	19.6	16.7
28.....	694	809	725	17.8	14.0	721	822	689	19.0	15.9
29.....	770	810	694	18.2	14.5	765	822	665	20.0	15.9
30.....	700	811	685	18.2	14.5	730	821	720	23.5	19.7
31.....										

	July					August				
1.....	725	821	738	25.4	20.9	599	784	794	28.4	17.5
2.....				26.4		566	782	719	24.6	16.9
3.....				27.5		698	780	716	23.7	16.3
4.....	732	819	725	24.1	20.7	724	778	714	22.6	17.0
5.....	739	818	687	23.2	16.1	707	776	673	22.3	16.7
6.....	738	817	669	23.0	20.6	649	774	740	22.4	18.2
7.....	761	816	660	24.2	21.9	619	772	765	25.0	18.3
8.....	758	815	651	25.7	16.8	664	770	781	27.6	16.6
9.....	632	814	768	27.8	13.3	669	768	749	27.4	13.4
10.....	677	813	742	31.9	11.8	663	766	733	25.1	18.0
11.....	727	812	697	29.1	9.3	636	763	725	23.3	18.3
12.....	724	811	708	26.1	14.4	649	760	722	23.4	18.5
13.....	682	810	734	22.6	18.6	658	757	779	22.9	18.2
14.....	733	808	745	22.9	18.3	685	755	734	21.8	16.6
15.....	721	807	701	22.5	19.3	664	752	728	21.6	16.4
16.....	716	806	731	23.8	20.1	596	749	715	21.6	16.8
17.....	706	805	775	23.4	19.9	514	746	761	21.0	17.3
18.....	701	804	727	23.1	19.3	611	743	781	21.2	15.9
19.....	534	803	736	22.1	20.0	300	740	774	19.8	14.7
20.....	659	802	782	21.3	18.9	700	737	662	20.4	14.3
21.....	676	801	747	21.2	18.5	694	734	717	22.1	15.7
22.....	701	800	765	23.1	20.1	494	731	810	27.4	15.7
23.....	697	799	759	25.2	20.6	615	727	806	24.8	19.2
24.....	678	798	758	27.7	18.6	443	724	838	23.2	20.7
25.....	670	797	731	26.9	20.5	274	721	839	21.6	21.5
26.....	696	796	701	23.1	20.1	481	718	804	22.0	20.0
27.....	651	794	707	21.4	19.2	667	715	751	22.4	17.7
28.....	710	792	721	22.3	17.7	578	711	765	21.4	18.0
29.....	688	790	793	23.3	17.9	676	707	692	22.6	16.9
30.....	565	788	789	25.0	19.1	664	703	696	25.6	15.2
31.....	569	786	791	29.0	17.9					

SAN VICENTE, CALIF.—Continued										
1959—Continued										
	September					October				
1.....	666	696	749	22.7	16.6	383	573	697	16.3	13.8
2.....	659	692	721	22.3	17.0	539	563	631	18.6	14.0
3.....	620	688	723	21.8	16.6	559	564	607	20.1	11.4
4.....	636	684	646	22.1	16.6	553	560	620	21.8	10.2
5.....	653	680	651	23.8	16.6	538	556	635	21.6	10.9
6.....	664	676	734	22.1	17.5	542	557	662	18.6	12.8
7.....	606	672	702	20.3	16.5	488	547	694	18.5	13.2
8.....	622	668	736	21.3	16.7	518	543	611	18.7	14.6
9.....	625	664	693	23.7	17.1	475	533	659	19.1	15.4
10.....	337	660	806	25.7	19.7	496	534	665	19.7	15.2
11.....	335	657	851	30.3	17.1	487	529	667	20.5	16.5
12.....	310	653	823	23.7	22.6	476	525	681	19.6	16.6
13.....	578	649	779	24.3	22.3	484	520	707	23.2	11.4
14.....	526	645	809	22.3	18.8	536	516	607	27.0	-----
15.....	586	641	697	18.9	14.4	517	512	621	26.6	-----
16.....	533	638	716	17.3	13.5	494	503	637	24.3	-----
17.....	598	634	745	19.9	14.2	496	504	659	19.9	13.8
18.....	598	630	663	21.1	16.7	506	500	688	18.2	14.9
19.....	544	626	778	21.4	17.2	445	493	781	17.6	15.0
20.....	476	621	749	20.6	17.2	487	497	674	17.4	13.2
21.....	587	617	716	19.2	14.5	424	487	675	17.2	14.0
22.....	550	612	719	19.6	13.9	487	483	650	20.6	14.0
23.....	586	608	691	19.4	13.7	455	479	659	22.5	12.4
24.....	569	603	706	20.1	15.9	448	474	697	20.9	15.3
25.....	556	599	709	20.6	16.3	360	469	807	18.3	16.3
26.....	549	595	745	19.3	15.2	115	465	821	18.2	16.3
27.....	533	590	763	19.1	15.0	-----	-----	-----	-----	-----
28.....	350	586	803	19.9	15.3	-----	-----	-----	-----	-----
29.....	487	581	781	20.0	15.6	-----	-----	-----	-----	-----
30.....	146	577	775	16.6	14.1	-----	-----	-----	-----	-----
31.....						-----	-----	-----	-----	-----

ROOSEVELT RESERVOIR, ARIZONA										
1958										
	April					May				
1.....	425	644	643	15.4	9.6	715	755	706	22.3	7.8
2.....	639	648	635	13.7	8.5	650	753	704	21.7	9.2
3.....	492	652	638	13.9	10.1	532	761	690	19.5	10.9
4.....	442	656	557	10.8	7.8	684	763	720	22.2	12.4
5.....	663	660	558	12.1	7.0	675	765	752	27.7	8.2
6.....	648	664	596	15.3	7.6	685	767	764	27.2	9.7
7.....	548	668	601	13.5	8.4	500	770	704	24.9	5.5
8.....	550	672	629	12.5	10.1	602	772	697	23.3	5.6
9.....	650	676	672	17.9	9.3	692	774	719	23.8	8.2
10.....	648	680	629	17.1	8.7	603	773	709	24.0	7.0
11.....	658	684	625	17.8	8.6	600	773	718	22.6	11.2
12.....	515	688	619	15.2	8.6	716	781	682	19.9	7.1
13.....	673	692	633	16.1	9.3	700	783	687	21.3	6.0
14.....	689	696	635	9.2	4.4	725	785	684	21.5	4.7
15.....	668	700	696	20.8	8.6	728	787	699	23.4	4.4
16.....	317	704	680	16.7	14.2	730	789	710	24.5	5.0
17.....	649	708	717	19.4	13.5	740	791	718	25.1	5.1
18.....	667	712	714	22.3	11.8	731	793	731	26.1	6.1
19.....	667	716	737	24.1	10.8	698	795	750	28.1	6.8
20.....	651	719	720	25.2	9.7	620	793	748	27.7	8.1

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)
ROOSEVELT RESERVOIR, ARIZONA—Continued										
1958—Continued										
	June					July				
1	748	814	712	27.3	10.2					
2	757	816	702	27.7	9.6	686	823	976	32.5	19.0
3	746	817	713	28.1	10.1	740	822	951	32.8	16.9
4	620	813	760	28.7	11.2	742	822	927	32.2	14.9
5	720	819	854	33.1	13.2	650	821	973	32.2	18.7
6	743	820	858	31.9	11.1	723	821	989	33.1	20.3
7	740	820	784	30.0	9.8	716	820	981	34.8	18.3
8	730	821	762	27.7	9.4	717	819	990	35.6	16.9
9	760	822	761	27.4	9.6	728	818	862	36.3	16.6
10	780	822	772	28.3	9.9	776	817	877	37.6	16.5
11	773	823	698	27.8	10.7	739	816	869	38.4	17.4
12	766	823	682	27.8	10.0	725	815	870	37.3	20.2
13	778	824	683	26.9	10.2	727	814	883	36.9	20.9
14	715	824	811	29.7	11.0	729	813	878	36.9	18.7
15	572	824	806	29.9	11.4	733	812	841	36.1	16.4
16	624	825	847	32.8	17.6	708	811	872	34.7	20.0
17	719	825	837	33.4	18.3	616	810	911	33.4	23.5
18	719	825	836	33.4	18.6	490	809	860	30.4	19.6
19	652	825	859	32.7	19.9	778	808	859	32.2	15.5
20	148	826	780	25.7	24.1	763	807	755	31.4	13.1
21	535	826	837	24.1	26.2	787	806	751	31.8	13.2
22	715	826	860	28.9	25.8	761	804	781	32.1	14.6
23	716	826	869	32.4	22.5	386	802	686	29.9	18.3
24	724	826	792	33.1	15.9	709	800	874	30.6	21.8
25	765	826	739	30.5	13.1	709	798	877	32.2	21.9
26	741	825	778	31.2	14.3	586	796	725	30.8	19.4
27	719	825	818	32.8	16.4	754	794	842	32.0	17.0
28	715	824	868	33.6	21.3	688	792	878	32.6	20.8
29	712	824	875	31.8	21.0	430	790	842	27.6	28.9
30						645	789	889	29.9	27.4
31						691	788	863	31.7	24.1
	August					September				
1	693	786	877	31.1	21.9	600	693	836	31.8	18.5
2	600	784	904	31.6	20.0	610	689	832	30.5	19.9
3	605	782	897	32.8	21.9	595	686	817	30.4	17.3
4	493	780	875	31.0	20.2	460	682	799	29.0	17.8
5	668	778	887	30.9	21.1	600	678	798	29.0	16.0
6	400	776	878	28.9	24.1	600	674	807	30.4	15.3
7	686	773	853	30.6	24.9	585	670	814	30.7	16.2
8	620	770	852	31.3	22.4	525	666	828	30.6	19.1
9	568	767	874	31.1	21.9	565	662	822	30.6	18.2
10	625	764	877	30.9	21.4	555	657	820	29.4	20.1
11	611	761	889	31.0	26.2	520	653	809	28.0	20.9
12	587	758	869	31.1	25.2	225	648	778	23.5	26.1
13	660	755	864	30.1	23.4	515	644	751	23.8	16.2
14	611	752	893	31.2	24.7	605	639	727	22.7	12.8
15	640	749	850	29.3	25.3	595	635	739	24.8	11.9
16	640	746	853	31.2	22.4	585	631	753	26.0	12.5
17	415	743	814	27.2	24.5	565	626	771	27.5	13.7
18	645	740	848	30.8	22.0	562	622	774	27.3	13.7
19	435	736	827	29.0	23.8	583	617	724	27.2	11.2
20	555	733	834	28.6	24.5	586	613	705	26.8	10.2
21	640	730	844	29.8	23.0	583	608	712	27.4	10.4
22	600	727	848	31.0	22.4	323	604	725	23.7	14.2
23	600	724	840	29.7	23.0	457	600	791	23.0	15.9
24	600	720	839	29.8	22.7	548	595	666	19.9	12.5
25	600	717	848	31.4	21.6	563	591	686	21.0	9.5
26	610	714	845	32.7	18.4	470	586	722	21.1	10.7
27	575	710	836	31.0	20.3	376	822	671	18.4	14.0
28	490	707	821	28.6	22.5	465	582	726	21.3	16.7
29	590	704	829	29.1	22.1	455	578	707	19.9	15.2
30	615	700	844	30.8	21.6	520	573	716	21.3	14.0
31	610	696	843	31.3	20.7					

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temperature (°C)	Air-vapor pressure (mb)
ROOSEVELT RESERVOIR, ARIZONA—Continued										
1958—Continued										
	October					November				
1	510	565	735	23.4	14.2	333	432	556	11.4	10.1
2	520	560	723	22.7	13.1	438	428	542	12.9	11.3
3	490	556	718	23.2	11.5	438	424	543	13.2	10.8
4	330	551	711	22.1	14.0	425	420	541	13.6	11.4
5	160	547	688	15.7	21.8	398	416	558	14.8	11.6
6	400	542	711	17.5	20.6	406	412	563	15.0	12.1
7	480	538	740	19.7	21.9	398	408	565	15.1	11.4
8	490	534	731	20.6	18.5	403	405	570	15.6	14.8
9	490	529	718	20.2	16.5	392	401	573	15.4	15.1
10	480	525	720	21.0	15.6	358	397	571	15.1	15.2
11	451	521	678	21.4	16.0	286	394	646	14.8	14.5
12	478	516	687	22.4	16.6	315	390	573	12.6	13.4
13	475	512	716	23.1	16.7	387	387	532	11.5	12.2
14	491	507	673	22.5	15.8	372	384	541	11.8	12.6
15	491	503	651	22.7	14.1	140	381	483	8.0	9.9
16	486	499	637	21.3	14.0	61	378	451	1.0	
17	473	494	627	20.8	13.5	297	375	445	1.3	
18	473	490	636	20.2	13.9	370	372	337	1.7	5.1
19	404	485	624	19.9	14.0	365	369	412	4.7	4.8
20	424	481	661	10.1	14.1	360	366	467	8.4	5.9
21	451	476	612	17.8	12.9	302	364	507	9.7	6.7
22	471	472	573	8.3	5.5	295	361	544	10.7	7.3
23	389	468	646	17.8	12.7	346	358	507	11.4	8.0
24	356	464	657	19.3	14.8	314	355	515	11.5	8.0
25	440	460	615	17.7	14.5	242	352	588	12.1	9.1
26	448	456	553	16.0	12.5	113	350	655	11.8	9.4
27	276	452	605	15.4	12.7	248	348	581	12.9	8.4
28	404	448	623	17.1	15.1	344	346	437	10.2	2.8
29	376	444	615	13.9	13.7	338	344	449	8.2	4.9
30	352	440	575	10.9	10.9	321	342	475	9.0	6.1
31	435	436	522	11.2	11.3					
	December									
1	323	340	448	8.9	6.3					
2	325	338	453	9.6	5.4					
3	317	336	477	11.8	4.3					
4	319	334	464	10.3	5.6					
5	301	332	455	9.5	6.3					
6	326	330	456	9.3	6.2					
7	316	328	455	9.2	6.2					
8	316	326	469	9.0	6.1					
9	287	324	500	9.5	6.6					
10	322	323	476	10.2	5.7					
11	329	322	481	9.9	5.2					
12	311	321	489	10.1	6.5					
13	328	320	449	9.5	5.0					
14	330	319	414	8.7	4.0					
15	332	318	422	6.8	4.3					
16	318	317	417	6.0	4.2					
17	328	317	431	6.3	4.3					
18	311	316	449	8.7	4.2					
19	302	316	420	7.6	4.9					
20	271	315	455	7.7	5.2					
21	310	315	459	8.0	5.5					
22	242	315	496	8.6	6.1					
23	304	315	471	7.5	5.7					
24	306	315	441	7.0	5.7					
25	314	316	437	6.4	5.4					
26	314	316	434	6.2	5.0					
27	323	317	456	6.8	4.8					
28	243	317	449	6.3	5.3					
29	318	318	414	5.2	3.8		</			

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

ROOSEVELT RESERVOIR, ARIZONA—Continued										
1959										
January					February					
1	326	320	402	4.1	3.9	277	392	482	7.6	4.7
2	320	321	463	5.3	4.1	252	396	571	8.2	5.9
3	268	323	503	7.6	5.4	373	399	480	7.8	5.4
4	280	324	465	3.5	4.3	381	403	443	7.6	5.2
5	323	326	441	5.4	5.3	375	406	491	8.3	5.5
6	66	327	502	3.9	7.0	383	410	481	10.7	6.4
7	305	329	524	6.5	7.5	294	414	503	10.7	6.5
8	277	330	452	5.6	6.0	170	418	571	10.6	8.0
9	277	332	462	5.4	5.4	145	422	475	5.5	6.8
10	338	333	468	7.1	4.1	414	426	468	5.6	6.5
11	330	335	447	7.8	5.5	368	430	491	9.0	6.8
12	330	337	442	7.7	5.5	178	434	581	9.4	8.8
13	309	339	504	7.9	5.7	344	438	558	9.9	8.7
14	323	341	453	8.5	5.8	416	442	505	9.7	7.7
15	336	343	427	7.7	4.8	370	446	554	11.5	7.6
16	301	345	451	7.8	4.3	185	451	654	13.3	9.6
17	286	347	489	9.3	6.2	162	455	680	13.6	11.7
18	292	350	491	9.8	6.2	256	459	617	14.2	10.5
19	255	353	539	12.8	7.1	440	464	539	11.7	8.2
20	341	356	478	10.6	5.0	431	468	538	12.8	7.6
21	327	358	437	6.1	4.1	68	473	571	9.9	8.8
22	281	361	493	7.0	4.5	475	477	473	8.6	6.2
23	358	364	487	9.2	5.3	454	482	500	10.0	6.4
24	331	367	482	10.3	6.3	460	486	506	17.4	6.0
25	333	370	495	11.2	6.6	477	490	490	11.6	6.1
26	325	373	499	11.3	6.1	465	495	523	12.8	6.3
27	351	376	481	11.1	5.8	475	499	530	14.3	6.7
28	345	379	463	10.4	5.4	445	503	518	13.9	6.9
29	291	382	477	9.3	4.8					
30	352	386	470	9.4	4.8					
31	367	389	456	8.9	4.5					

ROOSEVELT RESERVOIR, ARIZONA—Continued										
1959—Continued										
May					June					
1	595	755	679	25.2	17.4	772	814	736	27.2	7.8
2	547	758	649	21.0	16.2	691	816	740	27.2	10.2
3	570	760	645	17.9	13.6	737	817	708	28.9	6.9
4	609	763	645	14.6	10.7	635	818	731	29.4	10.4
5	730	765	595	18.9	7.7	751	819	755	30.0	11.7
6	636	767	634	22.1	7.8	717	820	731	29.9	7.4
7	695	770	626	23.2	12.1	709	820	731	30.0	7.9
8	710	772	632	23.1	14.4	741	821	691	29.4	7.6
9	428	774	624	21.9	14.7	727	822	744	29.1	7.3
10	717	776	640	23.0	15.0	740	822	700	29.9	7.3
11	724	779	683	26.6	13.7	722	823	773	31.1	8.6
12	656	781	703	27.9	10.6	544	823	848	32.6	8.0
13	649	783	707	28.1	12.8	265	824	739	29.6	13.1
14	708	785	688	27.7	19.4	546	824	918	32.5	15.7
15	701	787	676	27.2	3.6	673	824	872	35.0	9.2
16	738	789	668	26.0	2.3	668	825	869	35.0	9.2
17	698	791	652	25.3	3.0	617	825	861	33.8	10.2
18	709	793	653	25.5	1.7	522	825	901	32.4	14.1
19	722	795	708	25.0	8.3	518	825	936	29.1	14.6
20	719	796	710	23.5	7.2	587	826	876	31.7	13.4
21	659	798	712	22.2	9.4	631	826	866	31.9	12.9
22	746	800	652	21.8		599	826	842	32.6	10.3
23	742	802	659	24.8		603	826	876	34.1	9.5
24	720	803	678	25.3		663	826	608	32.9	8.5
25	761	804	606	21.4		844	826	818	32.5	6.3
26	737	806	640	19.2		693	826	866	31.7	8.5
27	757	807	648	24.0		703	826	798	30.4	11.6
28	754	809	659	25.7		691	824	828	29.9	13.3
29	761	810	640	25.6		695	824	930	30.2	14.9
30	480	811	629	24.6		635	824	877	30.0	17.2
31	752	813	638	24.7						

ROOSEVELT RESERVOIR, ARIZONA—Continued										
1959—Continued										
July					August					
1	617	823	814	30.1	16.1	584	786	880	30.5	19.3
2	652	823	856	33.4	14.0	550	784	882	30.2	19.8
3	649	822	872	32.9	15.0	569	782	838	27.9	21.6
4	691	822	858	31.4	16.0	472	780	853	28.5	22.4
5	685	821	877	33.8	14.6	397	778	823	26.7	22.7
6	692	821	631	33.8	13.3	458	776	857	26.8	21.6
7	621	820	809	33.1	14.5	573	773	815	27.9	21.9
8	690	819	839	35.6	10.7	593	770	880	29.8	21.2
9	524	818	889	31.8	15.4	446	767	880	29.9	18.5
10	655	817	873	32.9	15.9	451	764	826	25.0	20.3
11	637	816	860	32.7	14.6	511	761	857	29.0	21.7
12	644	815	909	32.4	15.6	388	758	856	26.4	22.5
13	643	814	928	32.0	14.8	580	755	860	30.3	21.5
14	654	813	867	32.2	16.5	548	752	862	28.7	21.1
15	589	812	865	30.8	17.3	539	749	830	26.7	21.8
16	574	811	877	30.9	18.9	647	746	871	31.2	21.3
17	511	810	904	30.2	19.6	668	743	867	31.7	21.4
18	583	809	914	31.2	18.7	391	740	841	30.0	22.2
19	621	808	879	32.1	18.6	501	736	821	29.4	16.9
20	583	807	904	30.5	20.0	608	733	857	31.1	20.9
21	573	806	868	29.6	19.9	585	730	834	30.0	18.9
22	596	804	776	32.5	21.0	564	727	844	30.0	21.1
23	626	802	862	32.3	20.3	574	724	844	30.6	20.8
24	655	800	890	34.4	18.6	570	720	828	31.1	22.0
25	669	798	895	35.0	18.0	521	717	855	30.0	22.4
26	523	796	881	32.4	19.8	633	714	831	30.6	21.6
27	640	794	965	31.4	20.8	648	710	825	31.7	19.5
28	633	792	949	31.5	19.8	637	707	826	32.2	18.2
29	497	790	923	30.4	19.5	638	704	824	32.8	18.1
30	557	789	902	29.9	20.7	634	700	847	32.8	21.2
31		789				623	696	775	31.9	14.1

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

ROOSEVELT RESERVOIR, ARIZONA—Continued										
1959—Continued										
September					October					
592	603	793	32.2	13.9	329	565	646	14.5	11.6	
589	689	773	31.6	13.3	133	560	607	13.0	11.9	
586	686	764	30.8	13.2	548	556	601	16.2	9.6	
596	682	715	29.9	11.5	533	551	576	18.2	8.3	
592	678	721	29.8	11.3	524	547	604	19.4	9.1	
582	674	739	30.7	10.8	325	542	607	19.5	9.2	
594	670	706	30.2	9.5	504	538	599	19.7	8.4	
594	666	712	29.6	11.0	487	534	608	20.5	8.9	
581	662	755	31.2	11.8	428	529	614	20.3	9.0	
255	657	794	29.2	11.9	481	525	628	21.7	9.5	
250	653	798	28.1	14.6	473	521	664	23.7	10.3	
431	648	800	29.2	12.4	434	516	659	24.2	10.1	
535	644	702	29.0	6.7	480	512	628	23.0	7.2	
553	639	742	27.9	10.8	451	507	611	23.4	7.0	
403	635	742	25.3	17.3	380	503	617	22.0	8.0	
540	631	668	24.6	13.3	430	499	651	22.0	8.0	
559	626	679	23.4	14.0	454	494	641	22.8	8.3	
557	622	685	24.2	9.9	456	490	628	21.5	8.7	
566	617	670	24.7	9.1	456	485	598	20.4	7.2	
554	613	682	25.2	10.1	445	481	608	20.5	7.7	
557	608	796	15.3	18.4	438	476	622	20.9	8.5	
574	604	653	25.2	9.2	438	472	626	22.0	8.5	
481	600	644	24.6	9.0	450	468	644	23.8	7.8	
466	595	698	23.3	13.6	418	464	660	24.8	8.7	
550	591	605	22.5	7.9	422	460	630	23.2	8.7	
534	586	619	22.6	7.5	408	456	647	22.9	9.2	
535	582	623	23.6	8.7	361	452	668	22.2	7.7	
530	578	632	23.7	9.4	374	448	647	21.3	8.8	
521	573	652	23.5	10.3	67	444	562	12.9	12.3	
311	569	658	19.2	12.5	84	440	517	6.4	8.0	
					349	436	545	9.1	7.9	

ROOSEVELT RESERVOIR, ARIZONA—Continued										
1960										
January					February					
1	108	320	548	0.5	6.7	336	392	527	8.7	6.8
2	323	321	402	-1.7	5.8	284	396	447	9.7	7.6
3	320	323	401	-1.2	5.2	402	399	459	8.6	5.4
4	252	324	419	-6	5.2	402	403	497	8.6	6.6
5	296	326	413	-1.2	4.8	378	406	454	7.2	6.1
6	313	327	426	-6	5.2	403	410	494	8.8	7.0
7	307	329	470	1.6	6.2	387	414	500	10.1	7.4
8	305	330	474	5.0	7.4	387	418	513	10.3	8.5
9	283	332	523	6.6	7.7	296	422	544	11.2	8.9
10	82	333	562	5.0	9.1	142	426	438	6.6	7.7
11	43	335	468	6.1	12.6					
12	194	337	532	5.5	10.8					
13	100	339	424	1.6	9.1					
14	289	341	497	1.1	7.3					
15	218	343	580	1.1	7.2					
16	95	345	417	1.6	7.7					
17	323	347	465	-1.7	4.6					
18	349	350	415	.6	4.8					
19	347	353	441	2.7	5.2					
20	359	356	437	3.3	5.6					
21	332	358	417	4.4	6.0					
22	322	361	455	5.0	6.8					
23	333	364	518	6.1	7.7					
24	357	367	544	7.7	8.8					
25	298	370	546	8.2	7.7					
26	260	373	552	9.8	8.5					
27	202	376	514	7.2	8.3					
28	363	379	512	8.7	7.2					
29	335	382	474	12.2	7.0					
30	298	386	531	10.0	11.4					
31	373	389	518	7.8	10.6					

LAKE MOHAVE, ARIZONA-NEVADA										
1959										
September					October					
1	256	688		26.1	17.6	490	561	726	26.5	8.4
2	538	684		31.2	23.3	485	557	716	26.9	9.8
3	481	680	761	30.6	25.1	482	552	771	27.3	14.0
4	302	677	773	32.4	25.0	479	548	792	28.4	15.3
5	388	673		31.1	23.2	460	544	807	29.5	13.3
6	599	669	768	32.8	22.8	457	540	815	29.5	12.0
7	600	665	735	34.8	24.0	466	535	774	30.5	13.7
8	440	661	741	33.3	22.3	410	531	708	27.2	9.8
9	517	657	792	34.0	20.5	176	526	729	20.7	10.2
10	494	653	821	34.8	21.8	421	521	684	19.0	9.3
11	481	649	864	35.8	19.2	433	516	661	19.9	10.4
12	564	645	795	36.5	17.4	464	512	668	22.0	10.1
13			801	36.2	15.7	439	507	709	21.4	8.5
14			792	35.5	15.0				21.0	8.9
15	545	632	701	33.0	14.3					
16			701	31.6	14.6					
17			739	31.0	13.1	349	489	723	22.2	10.9
18			687	31.0	15.2	416	484	735	21.8	12.3
19	421	614	715	31.8	12.8	432	479	688	22.5	11.7
20	536	609	761	30.5	12.5	443	474	667	22.6	9.8
21	497	605	733	30.3	11.2	440	469	662	23.2	10.3
22	544	600	717	27.7	7.5	439	464	670	22.7	10.9
23	535	595	712	27.7	7.1					
24	507	591	696	29.1	8.7	412	456	706	25.5	10.6
25	498	586	682	31.2	8.1	401	451	677	23.9	11.6
26	512	582	745	30.9	9.2	398	446	684	23.7	10.1
27	521	577	766	31.4	9.7	388	442	645	23.4	10.3
28	490	573	719	30.8	8.0	387	438	628	22.5	9.4
29			658	29.4	9.6	405	434	618	22.2	7.5
30			727	27.4	9.8	410	430	582	21.3	5.9
31						400	426	594	21.9	5.3

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

LAKE MOHAVE ARIZONA-NEVADA—Continued

1959—Continued

November					December					
1	404	422	642	21.5	6.7					
2	325	418	666	20.9	7.9	290	326	572	14.1	7.7
3	233	413	792	22.5	7.6	241	324	567	13.8	7.6
4	203	409	743	22.1	13.2	311	322	524	11.8	5.7
5	59	405	719	17.3	15.6	262	320	508	10.6	3.9
6	320	401	680	19.2	14.7	316	318	433	8.5	3.8
7	362	397	665	16.8	12.1					
8	360	393	612	17.0	12.2	265	315	569	8.2	6.2
9	359	390	607	17.2	10.1	232	314	594	9.6	7.3
10	345	387	586	18.4	8.3	285	313	533	8.6	6.3
11	358	384	612	18.1	10.1	282	312	541	11.9	7.5
12	338	380	597	16.3	10.2	254	311	576	14.2	6.2
13	288	377	596	16.3	10.2	289	310	549	14.6	6.6
14	340	373	565	14.8	8.7	289	309	575	12.0	7.4
15	331	370	558	14.5	6.1	283	308	528	11.0	8.2
16	361	367	542	18.0	5.0	295	307	515	13.3	7.3
17	341	363	553	18.3	7.0	287	307	471	13.4	6.0
18	343	360	607	17.5	8.0	290	307	534	14.5	7.5
19	314	357	619	18.2	6.7	298	306	529	15.4	6.9
20	330	354	574	16.4	6.5	294	306	539	15.5	4.7
21	340	351	574	16.5	8.1	228	306	531	14.3	4.3
22	333	348	543	17.6	7.1	286	306	536	17.2	5.6
23	327	345	571	12.6	8.3	307	306	533	18.2	6.7
24	317	342	583	15.3	7.9	292	306	561	16.3	8.5
25	317	340	602	15.3	7.5	289	306	583	15.8	8.0
26	241	338	625	16.0	7.9	290	306	626	16.0	8.4
27	318	336	565	14.0	5.7	301	307	570	14.5	7.4
28	314	334	514	13.6	6.0	296	307	567	14.5	6.9
29	241	332	564	14.0	4.9	298	307	570	14.6	6.6
30	265	330	578	16.2	7.0	320	308	577	15.0	6.4
31						322	309	576	14.1	6.3

1960

January					February					
1	319	310	567	12.6	6.7	351	382	667	16.3	8.0
2	312	311	539	12.2	5.7	298	386	682	16.7	7.0
3	320	312	560	13.3	6.5	391	389	644	15.3	7.9
4	268	313	590	12.6	5.7	407	393	636	16.0	6.2
5	318	314	593	14.6	5.5	413	397	607	15.2	5.3
6	320	316	591	16.0	5.2	397	401	678	13.6	5.7
7		317		16.2	5.9	300	405	737	15.5	6.5
8	318	319	646	13.5	6.1	401	409	672	14.4	6.8
9	319	321	635	15.5	6.6	433	413	697	16.5	7.8
10	328	323	660	17.5	6.6	418	417	718	17.8	9.2
11	322	325	698	18.8	8.2	400	421	729	18.7	8.3
12	319	327	708	18.9	8.3	407	425	739	18.9	8.8
13	323	329	589	14.4	9.9	323	429	665	15.2	6.3
14	319	331	619	15.9	11.3	435	433	622	17.4	5.8
15	320	333	629	17.5	12.3	418	437	690	17.2	6.8
16	328	335	615	18.5	13.6	226	442	715	17.2	7.2
17	324	337	591	17.2	12.6	454	446	679	16.4	7.2
18	320	339	583	16.4	9.0	388	451	721	15.4	6.1
19	335	342	602	16.2	5.6	450	455	727	16.2	7.4
20	232	346	612	16.6	5.3	444	459	673	18.2	7.2
21	353	348	598	15.2	5.5	441	463	553	20.0	7.6
22	326	350	626	12.2	5.4	416	468	570	17.5	6.2
23	325	353	631	15.8	5.2	489	472	553	14.1	4.1
24	324	356	678	16.4	5.1	487	476	570	13.3	3.8
25	310	359	695	15.3	8.8	433	480	603	14.8	3.1
26	86	362	669	13.6	11.5	444	485	649	15.9	4.2
27	237	365	707	13.8	10.0	493	489	557	13.1	3.1
28	370	368	642	11.2	5.6	493	493	610	15.1	4.1
29	344	371	618	10.6	6.4					
30	369	375	647	14.3	7.1					
31	366	379	708	14.2	8.4					

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

LAKE MOHAVE ARIZONA-NEVADA—Continued

1960—Continued

March					April					
1	502	498	629	17.0	4.5	627	640	713	22.3	7.1
2	452	502	650	17.4	4.9	610	645	773	25.8	7.7
3	391	507	687	16.4	7.9	623	649	782	27.4	8.3
4	235	511	633	12.6	7.8	653	653	800	28.9	5.5
5	493	516	655	13.3	8.3	515	658	728	23.7	5.2
6	504	521	677	16.5	6.2	632	662	712	23.4	9.4
7	525	525	612	15.3	4.4	233	666	710	18.1	10.9
8	521	530	599	16.6	4.1	671	670	689	17.9	7.2
9	530	535	648	18.6	4.7	629	674	716	20.6	5.0
10	535	540	651	18.7	4.4	638	678	735	21.8	7.8
11	529	545	671	18.8	4.4	668	682	707	20.6	6.0
12	501	549	697	19.4	6.0	673	686	701	23.1	5.1
13	548	554	699	20.1	4.0	683	690	707	20.6	-----
14	550	559	703	21.3	4.2	705	694	701	21.4	-----
15	431	564	655	19.2	6.4	655	698	723	23.4	5.9
16	576	569	706	16.9	6.8	662	702	717	25.0	6.3
17	451	573	665	16.2	5.5	665	706	755	27.1	6.3
18	380	577	658	15.9	6.4					
19	521	582	740	18.8	8.2	707	74	726	25.0	11.1
20	553	587	683	19.6	6.2	700	77	666	20.6	8.2
21	582	591	758	22.1	11-3					
22	575	595	747	22.7	6.7	690	724	675	20.6	6.2
23	528	600	706	23.1	5.9	716	728	629	18.5	4.5
24	569	604	653	19.6	6.5	710	732	653	17.9	4.5
25	555	609	682	16.5	5.8	693	735	678	18.6	4.4
26	589	613	645	15.4	5.0	715	738	691	20.8	4.8
27	583	618	704	19.3	7.4	725	741	706	23.3	4.3
28	388	622	763	15.2	7.5	715	744	710	25.0	5.8
29	434	627	729	16.1	7.0	717	747	725	27.0	3.9
30	622	632	691	17.2	6.7	680	730	774	29.9	3.8
31	595	636	705	20.2	5.9					

May

1	680	753	743	28.9	5.1	783	84	683	23.1	6.3
2	688	756	769	28.6	6.2	749	87	764	25.1	7.3
3	589	759	712	25.9	7.0	766	87	793	28.6	7.2
4	643	762	691	22.4	7.8	745	88	800	29.9	7.3
5						727	819	802	30.8	8.0
6	723	767	666	21.9	5.5	748	820	776	31.5	6.6
7	727	770	757	21.9	6.7	730	821	759	31.1	6.9
8	731	773	757	24.2	7.6	757	822	753	31.4	7.3
9	686	775	769	28.1	6.4	748	822	770	31.2	7.5
10	609	777	747	29.1	4.8	759	833	790	31.8	7.5
11	748	779	684	26.2	4.9	755	833	780	32.1	7.7
12	509	781	671	19.2	5.5	748	834	818	33.4	7.6
13	748	784	705	21.8	5.9	761	834	864	34.6	7.4
14	754	786	686	24.8	4.9	776	835	836	36.6	6.8
15	732	788	700	26.7	5.0	769	835	840	37.1	7.1
16	718	790	771	28.1	5.7	732	836	861	37.8	-----
17	727	792	730	27.7	6.2	727	836	897	37.4	11.1
18	739	793	728	28.3	5.9	723	837	896	37.6	12.3
19										

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

LAKE MOHAVE ARIZONA-NEVADA—Continued										
1960—Continued										
July					August					
1	488	824	821	32.6	669	782	916	37.8	14.2	
2	750	824	855	34.0	502	780	844	36.5	13.6	
3	293	823	867	28.6	511	778	911	36.1	15.3	
4	742	822	829	31.2	583	776	-----	33.0	20.5	
5	757	822	718	31.8	610	774	-----	34.9	19.4	
6	751	821	735	32.6	658	772	-----	38.9	12.4	
7	728	820	819	34.9	593	770	949	39.6	11.5	
8	725	819	873	38.2	598	768	918	39.8	13.0	
9	705	818	893	39.1	538	765	891	37.6	15.4	
10	712	817	853	38.7	586	762	887	35.9	17.4	
11	709	816	883	39.8	592	759	875	34.7	16.9	
12	686	815	884	38.3	622	756	888	36.4	14.6	
13	555	814	864	37.4	605	753	903	36.3	11.5	
14	698	812	841	37.4	650	750	853	36.8	10.9	
15	718	811	837	37.7	544	747	861	31.2	18.9	
16	674	810	865	39.2	630	744	871	33.6	17.7	
17	682	809	880	37.5	630	741	904	37.0	14.0	
18	701	807	-----	-----	428	738	895	32.5	13.2	
19	701	806	-----	-----	618	735	954	35.4	20.7	
20	694	805	-----	-----	579	732	977	37.8	18.3	
21	689	804	793	-----	607	728	958	38.3	17.8	
22	701	802	-----	-----	584	725	956	37.2	18.4	
23	658	800	-----	-----	425	721	888	28.9	22.6	
24	613	798	-----	-----	533	718	913	32.8	-----	
25	671	796	927	36.9	610	714	844	34.9	16.5	
26	664	794	918	38.1	620	711	767	35.4	10.5	
27	668	792	912	38.9	539	707	882	35.7	10.4	
28	637	790	940	39.2	623	703	812	34.2	12.4	
29	544	788	868	33.4	578	700	817	32.6	17.9	
30	668	786	851	34.4	614	696	853	30.2	10.4	
31	675	784	878	35.9	573	692	844	31.5	15.5	

LAKE MOHAVE ARIZONA-NEVADA—Continued										
1960—Continued										
November					December					
1	403	422	610	13.8	8.1	272	328	621	13.4	8.0
2	400	418	581	15.2	8.4	107	326	659	14.6	11.2
3	395	413	603	16.1	7.8	313	324	560	12.3	8.9
4	392	409	587	19.1	6.7	316	322	535	14.6	7.2
5	364	405	563	17.0	4.2	313	320	524	15.0	6.0
6	364	401	570	16.8	4.2	289	318	524	14.9	6.1
7	364	397	605	19.4	4.9	320	316	483	12.0	4.5
8	133	393	683	18.9	8.0	311	315	526	9.3	4.7
9	364	390	704	19.3	10.8	274	314	546	8.8	4.2
10	364	387	640	18.9	9.4	65	313	587	7.6	4.8
11	343	384	638	18.2	8.2	313	312	442	6.2	3.5
12	373	380	523	16.7	4.4	285	311	483	5.9	3.2
13	362	377	508	14.6	3.7	304	310	479	7.2	3.7
14	370	373	519	15.1	3.8	78	309	551	7.1	5.7
15	355	370	566	13.8	4.4	118	308	524	7.1	7.9
16	248	367	655	15.2	5.6	295	307	541	8.9	7.6
17	351	363	521	13.1	4.8	216	307	637	8.0	7.0
18	277	360	519	12.0	3.7	112	307	691	10.5	9.0
19	345	357	557	10.8	5.3	282	306	564	11.1	8.7
20	208	354	610	12.4	5.7	287	306	543	13.0	8.7
21	271	351	560	11.8	6.9	288	306	539	12.2	8.3
22	337	348	529	11.9	5.0	296	306	521	14.9	6.4
23	335	345	541	11.4	6.1	298	306	511	15.4	4.9
24	178	342	609	10.5	6.2	302	306	513	16.1	4.8
25	73	340	678	12.4	9.2	302	306	535	12.0	6.2
26	322	338	625	14.8	9.0	289	306	526	12.9	6.2
27	307	336	572	15.1	8.3	295	307	523	13.2	6.0
28	325	334	558	16.0	8.2	282	307	514	13.9	5.2
29	97	332	615	11.9	8.0	290	307	524	14.0	5.6
30	242	330	611	12.6	7.9	299	308	553	13.6	5.7
31	-----	-----	-----	-----	-----	239	309	591	16.1	5.1

1961										
January					February					
1	106	310	657	15.2	4.7	387	382	543	17.0	4.2
2	305	311	538	15.4	4.7	387	386	562	15.8	4.5
3	301	312	533	14.4	4.8	388	389	582	15.0	5.5
4	308	313	528	14.7	5.0	392	393	559	15.0	6.0
5	311	314	520	14.8	5.0	383	397	600	15.4	5.5
6	287	316	593	15.0	5.0	289	401	593	15.2	5.2
7	296	317	632	18.8	7.8	135	405	705	15.5	7.4
8	311	319	597	19.2	7.5	82	409	744	14.5	11.1
9	310	321	580	18.2	6.7	191	413	689	15.8	9.6
10	330	323	440	8.9	2.7	299	417	705	20.1	8.3
11	342	325	406	6.5	2.6	56	421	747	19.9	9.8
12	330	327	462	4.4	2.9	173	425	666	15.5	12.7
13	174	329	582	6.5	5.9	387	429	631	14.4	9.9
14	342	331	440	7.7	4.1	394	433	659	16.4	8.9
15	303	333	453	7.5	3.6	379	437	670	17.1	8.2
16	332	335	-----	-----	-----	361	442	605	15.9	6.2
17	261	337	-----	-----	-----	396	446	554	12.0	6.0
18	293	339	552	8.2	3.7	452	451	564	12.6	5.4
19	275	342	585	11.1	3.8	206	455	605	11.3	6.6
20	160	345	697	14.8	6.0	356	459	630	10.9	8.2
21	173	348	535	8.6	6.7	349	463	611	10.4	8.2
22	261	350	503	6.6	5.6	475	468	556	10.1	6.8
23	547	353	490	7.5	4.0	434	472	536	11.9	6.3
24	302	356	574	9.4	3.8	241	476	604	11.8	6.9
25	333	359	575	11.0	3.9	444	480	628	10.6	4.3
26	363	362	535	12.4	5.2	374	485	626	10.1	4.2
27	340	365	538	14.6	5.6	497	489	472	5.1	2.6
28	375	368	535	16.8	4.9	504	493	478	6.0	2.9
29	368	371	540	17.0	5.1	-----	-----	-----	-----	-----
30	380	375	539	17.6	4.6	-----	-----	-----	-----	-----
31	379	379	556	17.7	5.0	-----	-----	-----	-----	-----

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

BARRETT RESERVOIR NEAR SAN DIEGO, CALIF.										
1959										
November					December					
1						331	350	509	15.4	
2						323	348	522	15.7	
3						334	346	552	11.9	
4						324	344	567	12.0	
5						338	342	508	16.1	
6						308	341	532	16.5	
7						333	339	612	15.4	
8						125	337	659	13.5	8.0
9						160	336	590	11.5	12.2
10						173	335	580	12.5	12.2
11	146	404	604	15.0	6.4	304	334	530	11.3	8.6
12	305	400	570	14.3	6.4	317	333	539	10.6	6.1
13	322	397	528	14.4	8.1	153	332	539	6.4	6.1
14	338	394	636	14.5	11.2	301	331	461	5.7	4.3
15	200	391	628	13.2	11.4	299	330	480	7.9	4.1
16	368	388	532	11.9	8.9	295	329	481	9.3	5.6
17	346	385	557	15.6	5.9	283	329	506	9.6	6.5
18	246	382	632	17.5	8.4	293	328	493	11.3	6.5
19	284	379	592	13.5	10.6	225	328	464	13.1	6.1
20	356	376	553	14.0	6.6	59	328	486	13.0	8.3
21	326	374	519	12.3		57	327	490	10.2	11.9
22	342	371	522	15.5		151	327	503	9.7	9.0
23	335	368	556	15.1		72	327	545	12.3	9.7
24	336	365	575	17.0		65	327	532	11.7	10.9
25	328	363	539	15.1		83	327	502	9.6	10.9
26	307	361	529	17.8		309	327	445	8.1	6.5
27	348	358	465	16.7		299	328	459	6.7	4.0
28	338	356	527	13.8		182	328	468	7.4	4.4
29	332	354	496	14.2		310	329	514	7.7	5.8
30	342	352	492	15.1		288	329	578	6.8	7.0
31						293	330	557	7.4	6.6

1960										
January					February					
1	150	331	522	3.7	5.6	314	403	620	9.2	8.3
2	334	332	439	1.7	3.7	245	406	585	10.6	10.6
3	325	333	516	3.0	7.0	242	408	619	8.0	8.6
4	316	335	503	6.3	4.4	395	414	598	11.8	10.3
5	325	337	480	4.2	3.5	324	417	604	11.0	9.4
6	322	338	502	5.9	4.2	371	421	631	11.5	11.3
7	309	339	539	7.6	5.3	276	425	590	11.6	12.2
8	322	341	539	8.4	6.4	130	429	648	9.3	11.1
9	197	343	623	8.4	5.6	266	433	605	9.2	8.6
10	55	345	631	10.0	10.7	145	437	592	7.3	7.4
11	165	347	665	8.5	9.1	415	441	523	7.5	6.9
12	133	349	568	6.5	8.2	413	445	490	9.5	3.8
13	279	351	493	4.0	6.4	432	449	507	7.3	5.2
14	245	353	529	4.6	6.7	455	453	491	9.0	4.1
15	135	355	473	3.8	7.4	452	457	503	8.6	4.1
16	352	357	480	3.6	5.8	438	461	521	9.0	5.7
17	354	359	473	3.8	5.3	470	465	501	12.2	3.8
18	335	361	493	4.9	5.5	426	469	529	8.2	6.6
19	346	363	492	5.7	4.5	320	474	520	6.9	7.0
20	351	366	519	11.2	3.8	462	478	508	7.0	6.1
21	332	369	526	9.2	5.1	475	483	576	7.8	6.4
22	332	372	564	9.3	5.8	403	487	666	10.3	8.9
23	340	375	579	10.8	8.8	378	491	651	18.1	15.5
24	354	378	562	10.7	8.5	472	496	468	7.7	3.1
25	283	381	612	10.6	10.0	384	500	523	5.3	6.1
26	355	384	586	11.5	11.3	101	504	654	7.0	8.3
27	305	387	535	8.0	8.8	220	508	611	8.9	9.0
28	379	390	532	12.2	4.8	157	512	542	7.2	8.7
29	379	393	540	14.0	4.2	167	515	563	9.9	11.3
30	254	397	545	9.5	5.6					
31	340	400	544	9.0	6.8					

BARRETT RESERVOIR NEAR SAN DIEGO, CALIF.—Continued										
1960—Continued										
March					April					
1	149	518	643	9.1	10.4	612	631	623	16.8	9.3
2	503	521	577	9.8	8.9	642	635	596	18.1	5.7
3	474	526	578	11.4	9.6	641	639	610	17.4	5.0
4	508	530	586	11.7	8.7	623	633	637	18.4	7.3
5	518	534	598	13.3	9.0	630	638	649	19.2	7.9
6	462	539	608	13.9	9.7	582	632	680	17.8	8.4
7	506	543	594	13.4	10.1	647	636	647	15.0	9.1
8	516	548	582	13.0	10.4	619	630	678	15.8	11.0
9	540	552	563	12.1	8.4	648	634	668	15.9	11.6
10	548	556	581	12.6	8.8	660	638	644	16.6	11.1
11	539	561	590	12.4	9.9	617	632	630	12.2	9.5
12	533	565	624	12.8	10.2	555	636	582	10.4	10.6
13	350	570	636	12.1	11.8	673	700	590	14.8	7.2
14	554	574	629	14.0	10.5	630	703	598	14.9	6.2
15	565	579	559	13.0	6.1	658	706	590	14.1	7.6
16	568	583	562	12.7	5.4	651	710	640	15.9	10.5
17	593	587	563	16.5	5.2	686	714	623	17.8	6.6
18	576	592	616	15.5	5.6	668	718	629	18.3	7.9
19	595	596	605	16.4	6.0	679	721	613	16.6	8.1
20	587	600	627	17.0	6.5	680	724	658	18.0	9.9
21	587	604	638	16.7	7.4	661	728	607	15.7	11.7
22	545	608	635	14.0	9.1	404	731	613	11.1	8.5
23	352	612	654	12.8	11.0	553	733	570	8.0	8.0
24	556	617	689	12.2	11.1	461	736	594	9.2	8.2
25	530	621	700	13.2	12.1	691	739	547	11.4	7.4
26	550	625	723	13.3	12.0	588	742	557	9.6	8.7
27	137	629	716	11.8	11.8	124	745	642	10.8	12.2
28	243	634	623	10.7	10.8	674	748	597	10.6	9.1
29	625	638	584	11.1	9.7	680	751	608	11.1	8.9
30	624	642	610	12.5	10.3	661	754	645	15.0	9.4
31	598	647	625	14.4	11.3					

1960										
May					June					
1	688	757	630	17.6	7.6	717	814	742	20.0	15.9
2	640	760	685	13.0	10.2	668	815	761	21.4	17.1
3	146	763	694	10.3	10.2	320	819	763	18.6	16.9
4	184	766	646	10.6	11.7	681	817	802	19.4	15.9
5	716	769	632	12.4	10.4	683	818	808	19.1	16.8
6	713	771	651	19.3	9.1	711	818	800	19.2	17.1
7	700	773	658	18.7	10.3	686	819	739	20.7	14.9
8	722	775	674	19.0	10.0	684	819	665	18.8	12.8
9	722	777	697	19.9	11.7	743	820	685	19.3	12.5
10	710	778	697	21.8	10.8	749	820	661	20.1	13.2
11	717	780	695	22.3	10.0	736	820	703	21.4	13.5
12	718	782	699	21.0	9.6	735	821	743	21.3	15.0
13	679	784	713	18.3	11.1	751	821	732	22.5	15.6
14	580	786	785	15.0	11.4	734	822	751	22.4	14.6
15	201	788	724	12.2	12.3	719	822	751	21.3	16.0
16	223	790	756	12.8	12.1	737	822	742	22.6	14.8
17	590	792	781	15.9	13.4	714	823	714	24.1	13.0
18	611	794	728	15.5	12.8	728	823	756	23.2	13.4
19	723	796	635	18.0	8.7	748	824	651	23.3	9.7
20	753	797	578	18.6	6.3	752	824	663	24.4	8.1
21	755	799	607	16.3	8.9	731	824	719	27.0	7.0
22	755	801	604	14.1	9.1	708	824	724	26.8	8.1
23	774	803	582	13.1	8.8	744	824	701	24.3	11.4
24	593	804	572	13.3	10.1	747	824	668	23.3	10.8
25	755	805	619	16.1	10.8	757	823	686	24.0	9.2
26	736	807	664	19.7	10.0	774	823	646	23.5	7.8
27	693	808	656	21.0	9.9	777</				

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

BARRETT RESERVOIR NEAR SAN DIEGO, CALIF.—Continued										
1960—Continued										
July					August					
1.....	609	821	712	27.4	9.5	701	784	668	25.8	10.9
2.....	723	820	708	25.9	9.6	698	782	685	26.6	7.3
3.....	764	820	649	22.2	9.9	716	780	664	26.6	8.4
4.....	768	819	648	20.0	9.3	676	778	699	24.4	10.3
5.....	751	818	662	20.7	10.6	674	776	723	22.9	12.5
6.....	743	817	655	22.7	10.1	681	774	755	23.6	14.6
7.....	750	816	623	22.1	9.1	640	772	769	24.6	15.1
8.....	755	815	665	22.5	9.9	686	770	780	22.6	15.9
9.....	767	814	639	21.4	8.3	599	768	819	23.1	16.5
10.....	730	813	669	22.6	9.4	653	766	796	24.0	-----
11.....	740	812	663	24.3	9.6	613	763	779	25.8	-----
12.....	738	811	686	24.2	10.2	640	760	749	23.8	-----
13.....	771	810	671	23.3	10.7	655	757	730	24.9	-----
14.....	717	808	749	27.3	9.4	660	755	716	24.3	-----
15.....	697	807	738	29.6	9.9	660	752	710	23.0	-----
16.....	685	806	763	31.3	10.0	677	749	698	20.8	-----
17.....	676	805	798	30.8	11.1	640	746	712	23.2	-----
18.....	684	804	819	30.1	13.0	628	743	767	27.7	-----
19.....	596	803	814	32.3	11.9	649	740	740	26.4	-----
20.....	685	802	795	29.1	14.6	599	737	745	25.6	-----
21.....	606	801	824	29.1	15.3	633	734	728	26.6	-----
22.....	621	800	791	28.5	16.3	583	731	733	21.2	-----
23.....	639	799	769	27.4	14.9	671	727	696	20.1	-----
24.....	666	798	746	25.3	12.7	723	724	697	20.9	-----
25.....	661	797	763	25.1	11.6	660	721	615	18.7	-----
26.....	451	796	804	25.7	12.8	655	718	637	19.2	12.2
27.....	428	794	797	25.1	18.5	705	715	657	19.1	10.9
28.....	574	792	808	26.7	18.0	682	711	663	20.6	11.8
29.....	661	790	826	26.3	18.1	619	707	709	22.2	13.6
30.....	655	788	744	25.4	16.1	604	703	733	24.1	13.9
31.....	688	786	728	24.9	14.9	535	700	786	23.1	15.1

BARRETT RESERVOIR NEAR SAN DIEGO, CALIF.—Continued										
1960—Continued										
November					December					
1.....	397	441	549	15.6	8.3	207	350	582	12.2	8.0
2.....	289	437	622	14.9	8.9	190	348	534	8.3	9.3
3.....	52	433	638	12.5	12.7	154	346	523	7.3	7.2
4.....	176	429	595	12.6	14.2	318	344	492	6.4	7.1
5.....	154	425	699	15.1	13.9	320	342	443	6.3	4.2
6.....	274	422	587	13.5	12.8	332	341	392	6.3	-----
7.....	167	418	595	11.3	9.7	329	339	437	3.6	3.8
8.....	360	414	526	10.2	9.2	33	337	537	2.7	5.3
9.....	373	410	486	11.9	9.4	317	336	427	3.1	4.7
10.....	330	407	535	11.7	7.7	317	335	528	4.7	6.6
11.....	355	404	512	11.1	9.4	284	334	546	8.8	8.1
12.....	114	400	621	8.8	9.4	311	333	487	8.7	6.0
13.....	279	397	553	11.1	10.4	305	332	494	10.1	4.9
14.....	244	394	477	8.0	8.7	310	331	485	7.8	6.7
15.....	323	391	536	9.3	6.3	313	330	478	6.5	5.9
16.....	340	388	474	10.8	5.1	304	329	488	7.3	5.4
17.....	362	385	499	10.6	4.2	314	329	496	9.4	4.3
18.....	344	382	518	10.6	5.6	314	328	507	10.9	5.4
19.....	341	379	518	10.6	7.0	310	328	509	12.3	9.1
20.....	346	376	499	12.1	6.2	303	328	528	15.3	-----
21.....	339	374	485	11.4	5.4	301	327	496	12.0	-----
22.....	343	371	504	10.7	5.7	305	327	528	13.1	-----
23.....	340	368	493	10.8	5.0	314	327	506	12.2	-----
24.....	341	365	492	11.3	4.3	309	327	503	12.3	-----
25.....	341	363	480	10.8	4.5	260	327	512	11.4	-----
26.....	119	361	597	7.4	7.3	312	327	507	11.4	-----
27.....	233	358	508	7.8	8.3	310	328	514	10.2	-----
28.....	336	356	460	7.6	4.0	181	328	549	9.5	-----
29.....	179	354	513	9.9	5.1	269	329	509	10.4	-----
30.....	276	352	559	10.4	5.5	314	329	476	8.8	-----
31.....	-----	-----	-----	-----	-----	302	330	485	6.6	-----

1961										
January					February					
1.....	323	331	449	6.1	-----	343	403	613	11.4	10.9
2.....	316	332	469	7.6	-----	304	406	584	11.3	8.4
3.....	329	333	442	7.4	-----	366	408	546	10.5	9.1
4.....	212	335	508	8.3	-----	403	414	477	12.1	-----
5.....	150	337	532	9.8	-----	413	417	474	12.7	-----
6.....	330	338	475	9.4	-----	257	421	526	9.1	-----
7.....	323	339	463	9.5	-----	220	425	555	7.8	7.4
8.....	334	341	466	10.1	-----	392	429	522	8.8	8.0
9.....	314	343	478	10.7	-----	380	433	554	11.7	7.6
10.....	329	345	509	11.9	-----	398	437	570	13.9	7.1
11.....	335	347	496	12.6	-----	376	441	567	12.3	8.7
12.....	331	349	472	10.0	-----	365	445	563	10.3	8.8
13.....	337	351	493	10.5	-----	420	449	525	8.7	7.0
14.....	330	353	521	12.6	-----	439	453	530	11.5	6.3
15.....	330	355	524	13.6	-----	438	457	570	11.2	7.7
16.....	340	357	525	15.3	-----	148	461	627	9.6	9.4
17.....	329	359	532	14.8	-----	296	465	605	9.0	9.8
18.....	243	361	555	13.7	-----	400	469	546	7.8	7.6
19.....	259	363	598	16.4	-----	472	474	460	9.7	3.3
20.....	153	366	598	13.8	5.0	457	478	527	12.3	4.3
21.....	195	369	613	12.3	5.0	454	483	528	13.4	4.6
22.....	139	372	665	12.6	6.7	465	487	529	12.5	5.7
23.....	308	375	551	10.8	6.1	476	491	478	11.1	-----
24.....	340	378	526	9.0	7.3	488	496	481	13.7	-----
25.....	242	381	658	10.8	9.7	478	500	486	11.1	-----
26.....	50	384	603	10.0	11.6	454	504	549	9.0	-----
27.....	141	387	587	10.0	10.0	493	508	488	10.0	-----
28.....	275	390	566	8.4	8.7	490	512	513	12.6	-----
29.....	213	393	577	7.9	6.6	-----	-----	-----	-----	-----
30.....	283	397	576	10.5	6.9	-----	-----	-----	-----	-----
31.....	352	400	580	11.2	8.7	-----	-----	-----	-----	-----

September					October					
1.....	532	696	721	23.5	17.0	500	573	609	16.4	10.1
2.....	500	692	760	26.2	17.7	509	568	604	17.1	10.2
3.....	548	688	755	27.1	15.3	493	564	653	19.3	10.5
4.....	569	684	682	26.9	15.0	359	560	693	20.6	11.2
5.....	536	680	758	26.5	13.6	482	556	655	22.8	12.3
6.....	566	676	686	25.1	13.2	449	551	695	24.1	12.5
7.....	580	672	751	25.9	12.2	461	547	687	20.6	14.6
8.....	558	668	792	26.1	13.4	193	543	710	15.2	13.5
9.....	546	664	766	25.0	12.7	156	538	581	14.4	12.4
10.....	309	660	894	25.6	17.2	442	534	570	12.8	9.3
11.....	571	657	796	27.9	23.6	506	529	545	11.9	9.8
12.....	513	653	764	29.0	16.7	469	525	567	11.9	9.8
13.....	572	649	778	27.8	14.0	416	520	601	12.1	10.6
14.....	555	645	707	24.1	16.0	403	516	623	13.8	11.3
15.....	562	641	697	20.2	12.2	436	512	528	15.1	4.5
16.....	566	638	682	17.9	12.1	394	508	509	14.4	6.0
17.....	590	634	590	18.0	11.3	441	504	541	14.3	7.6
18.....	345	630	672	19.1	19.3	425	500	547	13.4	7.5
19.....	400	626	649	22.4	14.7	413	496	552	16.6	8.3
20.....	545	621	675	21.0	13.5	446	491	599	18.3	8.0
21.....	518	617	667	18.8	15.2	443	487	564	19.2	6.4
22.....	566	612	610	17.3	10.6	342	483	629	19.4	6.8
23.....	533	600								

TABLE 3.—Daily values of measured solar, estimated clear-sky solar, and atmospheric radiation, and daily average air temperature and air-vapor pressure at various localities for time shown—Continued

Day	Daily radiation (cal cm ⁻² day ⁻¹)			Daily average		Daily radiation (cal cm ⁻² day ⁻¹)			Daily average	
	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)	Measured solar	Estimated clear-sky solar	Atmospheric	Air temper- ature (°C)	Air-vapor pressure (mb)

BARRETT RESERVOIR NEAR SAN DIEGO, CALIF.—Continued

1961—Continued

March					April					
1	490	517	531	16.2	6.6	604	651	623	14.8	10.8
2	422	521	591	12.8	6.6	593	655	602	18.8	7.9
3	173	526	599	9.2	9.0	617	659	614	21.7	8.8
4	128	530	593	8.4	10.0	622	663	658	21.1	8.6
5	341	534	660	10.6	10.4	580	668	730	14.7	12.5
6	384	539	625	10.1	9.0	551	672	740	14.9	12.1
7	535	543	488	10.2	5.2	236	676	682	11.9	10.8
8	495	548	527	13.2	3.9	650	680	545	14.2	7.2
9	428	552	555	13.2	6.0	650	684	613	13.4	7.2
10	512	556	525	11.1	6.5	322	688	716	11.5	10.2
11	512	561	544	10.6	8.4	649	692	576	15.9	7.5
12	448	565	588	12.4	8.7	667	696	623	12.8	8.0
13	515	570	555	13.8	8.3	653	700	621	13.3	9.3
14	527	574	559	13.7	8.4	657	703	618	14.3	9.6
15	229	579	528	8.7	9.5	671	706	588	18.4	---
16	490	583	481	9.9	8.6	652	710	603	20.2	---
17	296	587	620	8.8	9.0	659	714	653	19.5	---
18	552	592	529	9.2	7.7	---	---	---	---	---
19	561	596	547	10.8	7.0	---	---	---	---	---
20	553	600	555	12.7	6.8	---	---	---	---	---
21	561	604	580	12.5	8.4	710	728	581	11.8	8.5
22	556	608	594	12.7	8.8	376	731	665	12.0	9.2
23	558	612	637	11.1	8.8	710	733	599	10.5	8.0
24	215	617	610	9.7	10.1	709	736	553	10.9	6.8
25	215	621	599	8.5	8.6	701	739	540	10.4	7.2
26	468	625	620	9.4	8.7	691	742	573	14.2	6.8
27	523	629	667	10.6	9.4	637	745	577	15.8	5.8
28	200	634	540	8.4	9.7	707	748	576	17.0	5.1
29	558	638	552	9.4	8.1	706	751	579	17.7	6.4
30	606	642	562	9.5	8.5	704	754	612	17.3	8.0
31	582	647	638	12.2	10.1	---	---	---	---	---

May

June

1	699	757	623	17.1	9.9	385	814	668	13.1	9.9
2	704	760	670	16.1	10.7	737	815	637	14.6	10.4
3	163	763	710	11.1	10.8	718	816	701	17.2	11.0
4	236	766	653	9.9	10.1	733	817	699	17.0	12.1
5	696	769	611	12.2	9.2	725	818	724	16.4	12.0
6	647	771	674	11.9	9.3	656	818	705	16.5	11.5
7	618	773	621	13.9	10.8	739	819	696	17.3	11.7
8	718	775	611	19.0	6.5	724	819	741	16.2	12.7
9	629	777	657	20.6	6.0	728	820	728	17.4	12.1
10	575	778	639	17.6	8.1	749	820	676	16.9	11.3
11	739	780	658	14.4	10.0	746	820	680	18.3	10.9
12	610	782	676	12.2	8.7	733	821	722	18.8	11.7
13	731	784	611	14.6	9.3	725	821	741	21.6	12.2
14	738	786	640	16.0	8.7	718	822	780	25.8	12.1
15	728	788	640	16.1	8.9	731	822	760	27.6	10.7
16	692	790	702	14.9	10.7	734	822	756	24.9	11.4
17	716	792	689	14.9	10.4	713	823	777	25.1	12.2
18	725	794	708	15.2	10.9	720	823	726	25.1	10.6
19	610	796	646	14.7	10.3	704	824	760	25.1	9.5
20	731	797	603	15.3	9.9	713	824	774	23.9	11.9
21	744	799	634	16.6	9.8	700	824	762	21.4	11.9
22	740	801	638	15.5	9.3	707	824	792	21.4	12.9
23	725	803	668	15.9	10.2	---	---	---	---	---
24	737	804	653	14.9	10.2	---	---	---	---	---
25	685	805	719	14.7	10.6	---	---	---	---	---
26	731	807	671	16.1	10.9	733	823	704	24.8	9.0
27	743	808	664	15.7	10.5	733	822	716	25.6	7.7
28	628	809	713	14.3	9.9	704	822	729	26.4	7.4
29	745	810	666	14.8	9.0	717	822	700	25.8	---
30	734	811	603	14.7	8.5	762	821	694	24.1	---
31	497	813	691	13.2	10.0	---	---	---	---	---

July

August

1	---	---	---	---	688	784	747	22.9	---
2	527	820	770	20.6	12.9	649	782	785	24.1
3	651	820	759	18.9	13.1	649	780	833	26.2
4	734	819	706	18.8	12.6	337	778	808	25.8
5	746	818	703	20.0	11.7	598	776	856	25.5
6	735	817	705	22.0	10.1	656	774	805	26.2
7	714	816	785	25.9	10.1	658	772	797	25.9
8	697	815	792	28.5	8.3	650	770	816	26.2
9	695	814	832	26.6	12.0	343	768	792	23.1
10	685	813	834	27.2	12.4	631	766	800	24.5
11	684	812	804	26.8	13.5	649	763	771	24.9
12	696	811	797	23.9	14.6	641	760	755	24.8
13	681	810	833	24.8	15.3	639	757	760	23.8
14	---	---	---	---	---	637	755	737	22.1
15	681	807	826	25.8	14.1	541	752	767	21.8
16	527	806	826	24.4	15.2	628	749	766	23.5
17	663	805	851	25.7	15.6	615	746	800	25.4
18	395	804	811	25.4	13.6	293	743	784	22.7
19	685	803	790	27.0	13.6	668	740	812	23.5
20	703	802	766	23.4	13.2	464	737	830	25.9
21	715	801	722	20.1	13.7	459	734	849	27.1
22	685	800	775	19.1	13.7	566	731	826	27.0
23	683	799	782	20.6	14.3	617	727	793	25.6
24	685	798	774	21.9	15.1	631	724	755	24.9
25	666	797	813	23.2	16.3	625	721	745	23.8
26	679	796	804	24.4	16.4	619	718	727	23.4
27	658	794	816	24.9	17.1	631	715	687	21.8
28	458	792	771	23.1	---	641	711	652	19.4
29	322	790	811	21.3	---	631	707	675	19.1
30	273	788	785	20.7	---	634	703	657	18.9
31	688	786	758	22.4	11.5	617	700	677	20.2

September

October

1	621	696	686	22.4	9.5	496	573	577	19.1	8.8
2	623	692	647	19.8	9.1	508	568	582	22.4	5.4
3	638	688	595	22.9	---	482	564	598	23.6	4.9
4	630	684	593	23.0	---	484	560	638	23.9	6.2
5	604	680	620	22.1	---	407	556	648	21.1	8.1
6	583	676	664	22.8	---	488	551	593	19.2	7.8
7	606	672	610	20.8	9.0	486	547	637	13.9	10.9
8	619	668	639	16.8	10.3	68	543	557	7.8	9.0
9	---	---	---	---	---	452	538	568	9.4	8.3
10	---	---	---	---	---	475	534	574	12.4	7.7
11	560	657	714	25.1	9.4	473	529	601	14.5	8.3
12	557	653	712	23.1	11.4	472	525	615	17.2	7.3
13	538	649	712	20.9	15.8	470	520	641	23.2	5.6
14	551	645	682	19.9	16.2	374	516	695	28.2	7.8
15	566	641	681	19.6	15.7	419	512	719	28.4	8.4
16	554	638	756	18.5	15.4	347	508	665	22.8	7.3
17	446	634	725	16.5	13.9	437	504	664	20.2	8.4
18	554	630	608	15.8	12.3	422	500	653	18.1	10.1
19	553	626	680	15.2	12.1	371	496	646	17.1	11.1
20	503	621	740	16.7	12.9	424	491	675	15.5	11.9
21	161	617	755	14.6	12.5	313	487	734	15.2	12.2
22	218	612	701	14.4	10.9	418	483	628	14.9	11.7
23	548	608	595	14.9	10.9	421	479	558	14.6	8.3
24	538	603	613	17.3	11.3	---	---	---	---	---
25	542	599	643	20.8	10.0	---	---	---	---	---
26	532	595	656	22.9	7.7	---	---	---	---	---
27	524	590	663	23.8	6.8	---	---	---	---	---
28	519	586	644	22.2	8.7	---	---	---	---	---
29	530	581	604	19.4	8.8	---	---	---	---	---
30	528	577	569	18.1						