TABLE 2.—*Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface*

| Week beginning— | Washington | Madison | Lincoln | Chicago | New York | Fresno | Cambridge | Fairbanks | Miami | New Orleans | Riverside | Blue Hill | San Juan | Newport |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Gram-calories per square centimeter | | | | | | | | | | | | | |
| | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* | *cal.* |
| July 30 | 664 | 614 | 582 | 599 | 433 | 666 | 492 | 400 | 417 | 412 | 466 | 492 | 636 | 608 |
| Aug. 6 | 629 | 481 | 526 | 493 | 458 | 681 | 569 | 291 | 361 | 467 | 503 | 617 | 593 | 585 |
| Aug. 13 | 478 | 504 | 476 | 462 | 361 | 635 | 440 | 355 | 476 | 301 | 488 | 428 | 610 | 486 |
| Aug. 20 | 555 | 458 | 567 | 515 | 385 | 612 | 398 | 246 | 355 | 436 | 483 | 419 | 448 | 396 |
| Aug. 27 | 516 | 473 | 428 | 470 | 363 | 618 | 366 | 275 | 344 | 476 | 506 | 390 | 567 | 345 |
| | Departures of daily totals from normals | | | | | | | | | | | | | |
| July 30 | +183 | +138 | +57 | +189 | +2 | −1 | -------- | +56 | −61 | +18 | −95 | −38 | +59 | +80 |
| Aug. 6 | +183 | +22 | +23 | +90 | +78 | +37 | -------- | −24 | −125 | +73 | −29 | +110 | +58 | +73 |
| Aug. 13 | +34 | +57 | −17 | +54 | −15 | +6 | -------- | +60 | +10 | −57 | −40 | −82 | +77 | +15 |
| Aug. 20 | +136 | +13 | +75 | +97 | +49 | +16 | -------- | −33 | −112 | +58 | −28 | −79 | −85 | −36 |
| Aug. 27 | +94 | +62 | −18 | +105 | +6 | +37 | -------- | +33 | −117 | +77 | +17 | −21 | +16 | −87 |
| | Accumulated departures since Jan. 1 | | | | | | | | | | | | | |
| | +14,224 | +8,736 | +5,145 | +14,252 | +5,682 | +987 | -------- | +595 | −3,535 | +4,893 | −3,045 | +2,156 | +7,159 | +2,142 |

## POSITIONS AND AREAS OF SUN SPOTS

Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.) Superintendent, U. S. Naval Observatory. Data from measurements at the U. S. Naval Observatory from plates obtained at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's visible hemisphere. For each day, below longitude, latitude, area of spot or groups, and spot count, are given respectively the assumed longitude of the center of the disk, assumed latitude of the center of the disk, total area of spots and groups, and total spot count]

| Date | Eastern standard time | | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h* | *m* | | ° | ° | ° | ° | | | | |
| Aug. 1 | 11 | 23 | 6557 | −75 | 314 | +12 | 74 | 776 | 15 | VG | U. S. Naval. |
| | | | 6556 | −52 | 337 | −17 | 55 | 242 | 35 | | |
| | | | 6553 | −39 | 350 | +5 | 40 | 12 | 12 | | |
| | | | 6553 | −29 | 0 | +7 | 30 | 582 | 9 | | |
| | | | 6555 | +29 | 58 | −21 | 39 | 36 | 8 | | |
| | | | 6552 | +34 | 63 | −21 | 44 | 36 | 5 | | |
| | | | 6550 | +42 | 71 | −23 | 50 | 121 | 10 | | |
| | | | | | (29) | (+6) | | 1,805 | 94 | | |
| Aug. 2 | 11 | 35 | 6557 | −62 | 314 | +12 | 61 | 970 | 25 | VG | Do. |
| | | | 6556 | −38 | 338 | −16 | 45 | 339 | 20 | | |
| | | | 6558 | −19 | 357 | +12 | 20 | 97 | 10 | | |
| | | | 6553 | −16 | 0 | +8 | 17 | 485 | 1 | | |
| | | | 6553 | −15 | 1 | +5 | 17 | 97 | 9 | | |
| | | | 6555 | +40 | 56 | −21 | 48 | 36 | 3 | | |
| | | | 6552 | +45 | 61 | −21 | 50 | 61 | 6 | | |
| | | | 6550 | +55 | 71 | −24 | 61 | 61 | 2 | | |
| | | | | | (16) | (+6) | | 2,146 | 76 | | |
| Aug. 3 | 11 | 30 | 6557 | −48 | 315 | +12 | 49 | 970 | 62 | VG | Do. |
| | | | 6556 | −24 | 339 | −16 | 27 | 242 | 53 | | |
| | | | 6558 | −4 | 359 | +14 | 10 | 339 | 41 | | |
| | | | 6553 | −2 | 1 | +8 | 3 | 485 | 9 | | |
| | | | 6553 | −1 | 2 | +5 | 4 | 24 | 8 | | |
| | | | 6553 | −1 | 2 | +10 | 3 | 24 | 8 | | |
| | | | | | (3) | (+6) | | 2,084 | 181 | | |
| Aug. 4 | 10 | 58 | 6557 | −35 | 315 | +12 | 35 | 970 | 30 | F | Do. |
| | | | 6556 | −11 | 339 | −16 | 24 | 291 | 21 | | |
| | | | 6558 | +10 | 0 | +14 | 13 | 339 | 48 | | |
| | | | 6553 | +11 | 1 | +8 | 12 | 485 | 2 | | |
| | | | 6553 | +11 | 1 | +5 | 11 | 24 | 5 | | |
| | | | | | (350) | (+6) | | 2,109 | 106 | | |
| Aug. 5 | 11 | 2 | 6557 | −22 | 314 | +12 | 22 | 921 | 61 | VG | Do. |
| | | | 6556 | +3 | 339 | −16 | 23 | 436 | 34 | | |
| | | | 6560 | +15 | 351 | −9 | 20 | 12 | 3 | | |
| | | | 6560 | +19 | 355 | −4 | 22 | 6 | 2 | | |
| | | | 6555 | +24 | 0 | +14 | 25 | 436 | 64 | | |
| | | | 6553 | +24 | 0 | +10 | 25 | 6 | 1 | | |
| | | | 6553 | +25 | 1 | +8 | 25 | 485 | 11 | | |
| | | | | | (336) | (+6) | | 2,302 | 176 | | |
| Aug. 6 | 11 | 55 | 6561 | −73 | 250 | −15 | 74 | 194 | 10 | G | Mt. Wilson. |
| | | | 6557 | −13 | 310 | +12 | 14 | 388 | 8 | | |
| | | | 6557 | −3 | 320 | +12 | 7 | 485 | 32 | | |
| | | | 6556 | +16 | 339 | −14 | 25 | 436 | 63 | | |
| | | | 6560 | +24 | 347 | −8 | 20 | 24 | 4 | | |
| | | | 6559 | +28 | 351 | −4 | 30 | 6 | 3 | | |
| | | | 6558 | +37 | 0 | +15 | 39 | 388 | 30 | | |
| | | | 6553 | +39 | 2 | +8 | 39 | 485 | 1 | | |
| | | | | | (323) | (+6) | | 2,406 | 151 | | |

## POSITIONS AND AREAS OF SUN SPOTS—Continued

| Date | Eastern standard time | | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h* | *m* | | ° | ° | ° | ° | | | | |
| Aug. 7 | 10 | 58 | 6565 | −89 | 221 | −12 | 89 | 242 | 1 | VG | U. S. Naval. |
| | | | 6566 | −89 | 221 | +17 | 89 | 242 | 2 | | |
| | | | 6561 | −58 | 252 | −16 | 62 | 388 | 15 | | |
| | | | 6564 | −50 | 260 | +5 | 50 | 12 | 2 | | |
| | | | 6563 | −33 | 277 | −10 | 37 | 12 | 3 | | |
| | | | 6557 | 0 | 310 | +13 | 7 | 436 | 15 | | |
| | | | 6557 | +10 | 320 | +13 | 12 | 436 | 27 | | |
| | | | 6556 | +30 | 340 | −16 | 36 | 436 | 24 | | |
| | | | 6560 | +38 | 348 | −9 | 41 | 6 | 2 | | |
| | | | 6553 | +41 | 351 | +7 | 42 | 36 | 6 | | |
| | | | 6558 | +50 | 0 | +14 | 50 | 291 | 2 | | |
| | | | 6553 | +51 | 1 | +8 | 51 | 485 | 15 | | |
| | | | | | (310) | (+6) | | 3,022 | 114 | | |
| Aug. 8 | 10 | 49 | 6565 | −75 | 222 | −12 | 76 | 436 | 3 | VG | Do. |
| | | | 6566 | −74 | 223 | +17 | 73 | 242 | 12 | | |
| | | | 6561 | −45 | 252 | −16 | 50 | 485 | 45 | | |
| | | | 6564 | −35 | 262 | +4 | 35 | 97 | 22 | | |
| | | | 6563 | −17 | 280 | −10 | 23 | 24 | 7 | | |
| | | | 6562 | +7 | 304 | −8 | 15 | 97 | 20 | | |
| | | | 6557 | +12 | 309 | +13 | 14 | 388 | 25 | | |
| | | | 6557 | +23 | 320 | +13 | 25 | 533 | 50 | | |
| | | | 6556 | +43 | 340 | −16 | 49 | 242 | 30 | | |
| | | | 6553 | +55 | 352 | +7 | 54 | 6 | 1 | | |
| | | | 6553 | +65 | 2 | +8 | 64 | 533 | 2 | | |
| | | | 6558 | +68 | 5 | +14 | 68 | 121 | 6 | | |
| | | | | | (297) | (+6) | | 3,204 | 223 | | |
| Aug. 9 | 11 | 0 | 6567 | −88 | 196 | −19 | 88 | 242 | 2 | VG | Do. |
| | | | 6566 | −61 | 223 | +17 | 61 | 218 | 2 | | |
| | | | 6565 | −60 | 224 | −13 | 63 | 582 | 20 | | |
| | | | 6561 | −32 | 252 | −16 | 38 | 436 | 42 | | |
| | | | 6564 | −22 | 262 | +4 | 22 | 388 | 16 | | |
| | | | 6562 | +21 | 305 | −8 | 25 | 218 | 20 | | |
| | | | 6557 | +26 | 310 | +13 | 26 | 339 | 16 | | |
| | | | 6557 | +37 | 321 | +13 | 37 | 436 | 33 | | |
| | | | 6556 | +56 | 340 | −16 | 59 | 388 | 25 | | |
| | | | 6553 | +78 | 2 | +8 | 79 | 582 | 2 | | |
| | | | 6558 | +80 | 4 | +14 | 80 | 121 | 2 | | |
| | | | | | (284) | (+6) | | 3,950 | 180 | | |
| Aug. 10 | 10 | 53 | 6567 | −80 | 190 | −19 | 80 | 97 | 6 | G | Do. |
| | | | 6567 | −70 | 200 | −19 | 73 | 388 | 4 | | |
| | | | 6565 | −48 | 222 | −13 | 51 | 242 | 15 | | |
| | | | 6566 | −47 | 223 | +17 | 46 | 291 | 10 | | |
| | | | 6565 | −43 | 227 | −12 | 45 | 291 | 4 | | |
| | | | 6569 | −40 | 230 | +17 | 42 | 6 | 3 | | |
| | | | 6561 | −19 | 251 | −17 | 29 | 485 | 41 | | |
| | | | 6564 | −7 | 263 | +4 | 7 | 485 | 20 | | |
| | | | 6563 | +9 | 279 | −11 | 19 | 12 | 5 | | |
| | | | 6562 | +35 | 305 | −8 | 38 | 194 | 14 | | |
| | | | 6557 | +38 | 308 | +13 | 37 | 291 | 15 | | |
| | | | 6568 | +46 | 316 | −24 | 55 | 121 | 18 | | |
| | | | 6557 | +49 | 319 | +13 | 48 | 436 | 18 | | |
| | | | 6556 | +68 | 338 | −16 | 70 | 339 | 21 | | |
| | | | | | (270) | (+6) | | 3,678 | 194 | | |

## POSITIONS AND AREAS OF SUN SPOTS—Continued

| Date | Eastern standard time | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h m* | | ° | ° | ° | ° | | | | |
| Aug. 11 | 11 3 | 6570 | −88 | 169 | +12 | 82 | 291 | 2 | G | U. S. Naval. |
| | | 6567 | −66 | 191 | −19 | 71 | 194 | 10 | | |
| | | 6567 | −56 | 201 | −19 | 61 | 339 | 9 | | |
| | | 6566 | −34 | 223 | +17 | 35 | 218 | 3 | | |
| | | 6565 | −30 | 227 | −12 | 36 | 388 | 18 | | |
| | | 6569 | −26 | 231 | +16 | 27 | 36 | 9 | | |
| | | 6561 | −5 | 252 | −17 | 24 | 485 | 58 | | |
| | | 6564 | +7 | 264 | +4 | 7 | 630 | 23 | | |
| | | 6562 | +49 | 306 | −8 | 51 | 291 | 8 | | |
| | | 6557 | +51 | 308 | +13 | 52 | 242 | 8 | | |
| | | 6568 | +60 | 317 | −23 | 66 | 48 | 3 | | |
| | | 6557 | +61 | 318 | +12 | 62 | 388 | 11 | | |
| | | 6556 | +83 | 340 | −14 | 86 | 24 | 1 | | |
| | | | | (257) | (+6) | | 3,574 | 163 | | |
| Aug. 12 | 11 2 | 6572 | −88 | 156 | −7 | 88 | 145 | 2 | G | Do. |
| | | 6570 | −71 | 173 | +12 | 71 | 194 | 2 | | |
| | | 6567 | −52 | 192 | −19 | 58 | 194 | 24 | | |
| | | 6567 | −44 | 200 | −19 | 50 | 388 | 9 | | |
| | | * | −31 | 213 | −15 | 37 | 6 | 2 | | |
| | | 6566 | −21 | 223 | +17 | 24 | 206 | 48 | | |
| | | 6565 | −17 | 227 | −13 | 26 | 679 | 50 | | |
| | | 6561 | +9 | 253 | −17 | 14 | 436 | 69 | | |
| | | 6571 | +11 | 255 | +17 | 16 | 194 | 27 | | |
| | | 6564 | +16 | 260 | +4 | 16 | 291 | 16 | | |
| | | 6564 | +23 | 267 | +4 | 24 | 242 | 12 | | |
| | | 6562 | +63 | 307 | −8 | 65 | 267 | 15 | | |
| | | 6557 | +65 | 309 | +13 | 66 | 242 | 7 | | |
| | | 6568 | +74 | 318 | −23 | 79 | 24 | 9 | | |
| | | 6557 | +76 | 320 | +12 | 74 | 388 | 4 | | |
| | | | | (244) | (+6) | | 3,896 | 296 | | |
| Aug. 13 | 11 27 | 6572 | −73 | 157 | −8 | 74 | 242 | 3 | F | Mt. Wilson. |
| | | 6570 | −59 | 171 | +12 | 58 | 133 | 2 | | |
| | | 6567 | −39 | 191 | −19 | 42 | 194 | 3 | | |
| | | 6567 | −31 | 199 | −19 | 34 | 388 | 13 | | |
| | | 6566 | −8 | 222 | +17 | 12 | 194 | 1 | | |
| | | 6565 | −4 | 226 | −13 | 20 | 582 | 75 | | |
| | | 6561 | +21 | 251 | −17 | 30 | 338 | 56 | | |
| | | 6571 | +23 | 253 | +17 | 25 | 242 | 40 | | |
| | | 6564 | +30 | 260 | +4 | 30 | 242 | 16 | | |
| | | 6573 | +34 | 264 | +22 | 36 | 48 | 4 | | |
| | | 6564 | +38 | 268 | +4 | 38 | 194 | 8 | | |
| | | 6563 | +50 | 280 | −9 | 50 | 6 | 3 | | |
| | | 6562 | +78 | 308 | −7 | 78 | 97 | 4 | | |
| | | 6557 | +80 | 310 | +13 | 79 | 145 | 5 | | |
| | | | | (230) | (+7) | | 3,095 | 233 | | |
| Aug. 14 | 10 53 | 6572 | −60 | 157 | −8 | 62 | 291 | 9 | G | Do. |
| | | 6570 | −45 | 172 | +12 | 44 | 97 | 13 | | |
| | | 6567 | −18 | 199 | −19 | 31 | 533 | 27 | | |
| | | 6566 | +7 | 224 | +16 | 13 | 194 | 1 | | |
| | | 6565 | +10 | 227 | −13 | 15 | 388 | 95 | | |
| | | 6561 | +36 | 253 | −17 | 43 | 48 | 30 | | |
| | | 6571 | +37 | 254 | +17 | 38 | 267 | 28 | | |
| | | 6561 | +41 | 258 | −17 | 48 | 242 | 1 | | |
| | | 6564 | +44 | 261 | +4 | 44 | 242 | 30 | | |
| | | 6573 | +48 | 265 | +23 | 50 | 24 | 2 | | |
| | | 6564 | +51 | 268 | +5 | 32 | 194 | 15 | | |
| | | | | (217) | (+7) | | 2,520 | 261 | | |
| Aug. 15 | 10 59 | 6577 | −85 | 119 | −31 | 88 | 48 | 1 | G | U. S. Naval. |
| | | 6576 | −81 | 123 | +12 | 80 | 339 | 3 | | |
| | | 6572 | −47 | 157 | −8 | 49 | 291 | 5 | | |
| | | 6570 | −32 | 172 | +12 | 33 | 61 | 15 | | |
| | | 6567 | −4 | 200 | −19 | 25 | 485 | 12 | | |
| | | 6574 | −2 | 202 | +16 | 10 | 48 | 13 | | |
| | | 6575 | +11 | 215 | +14 | 13 | 24 | 2 | | |
| | | 6566 | +20 | 224 | +17 | 23 | 194 | 3 | | |
| | | 6565 | +23 | 227 | −13 | 25 | 388 | 45 | | |
| | | 6561 | +46 | 250 | −17 | 50 | 48 | 12 | | |
| | | 6571 | +50 | 254 | +17 | 50 | 267 | 23 | | |
| | | 6561 | +52 | 256 | −17 | 56 | 242 | 13 | | |
| | | 6564 | +60 | 264 | +4 | 60 | 533 | 40 | | |
| | | 6573 | +60 | 264 | +23 | 61 | 6 | 1 | | |
| | | | | (204) | (+7) | | 2,974 | 188 | | |
| Aug. 16 | 11 9 | 6576 | −79 | 112 | +13 | 76 | 388 | 19 | G | Do. |
| | | 6577 | −70 | 121 | −31 | 78 | 194 | 1 | | |
| | | 6576 | −68 | 123 | +12 | 68 | 582 | 4 | | |
| | | 6572 | −33 | 158 | −8 | 36 | 291 | 5 | | |
| | | 6570 | −19 | 172 | +12 | 20 | 24 | 7 | | |
| | | 6567 | +9 | 200 | −19 | 18 | 485 | 13 | | |
| | | 6574 | +11 | 202 | +17 | 16 | 121 | 30 | | |
| | | 6566 | +32 | 223 | +16 | 33 | 194 | 5 | | |
| | | 6565 | +37 | 228 | −13 | 39 | 242 | 25 | | |
| | | 6561 | +59 | 250 | −19 | 62 | 12 | 1 | | |
| | | 6571 | +64 | 255 | +16 | 63 | 170 | 8 | | |
| | | 6561 | +67 | 258 | −17 | 70 | 291 | 7 | | |
| | | 6564 | +73 | 264 | +3 | 72 | 630 | 20 | | |
| | | | | (191) | (+7) | | 3,624 | 145 | | |



## POSITIONS AND AREAS OF SUN SPOTS—Continued

| Date | Eastern standard time | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h m* | | ° | ° | ° | ° | | | | |
| Aug. 17 | 10 50 | 6576 | −66 | 112 | +13 | 53 | 533 | 30 | VG | U. S. Naval. |
| | | 6577 | −57 | 121 | −32 | 67 | 145 | 1 | | |
| | | 6576 | −54 | 124 | +12 | 53 | 582 | 6 | | |
| | | 6572 | −20 | 158 | −8 | 25 | 291 | 3 | | |
| | | 6570 | −4 | 174 | +12 | 6 | 24 | 6 | | |
| | | 6567 | +22 | 200 | −19 | 33 | 436 | 10 | | |
| | | 6574 | +24 | 202 | +17 | 26 | 388 | 42 | | |
| | | 6566 | +45 | 223 | +16 | 45 | 194 | 2 | | |
| | | 6565 | +45 | 223 | −14 | 50 | 24 | 4 | | |
| | | 6565 | +50 | 228 | −13 | 55 | 170 | 16 | | |
| | | 6561 | +82 | 260 | −17 | 86 | 291 | 6 | | |
| | | 6571 | +83 | 261 | +17 | 80 | 145 | 2 | | |
| | | 6564 | +84 | 262 | +3 | 81 | 436 | 4 | | |
| | | | | (178) | (+7) | | 3,659 | 132 | | |
| Aug. 18 | 14 14 | 6578 | −71 | 92 | −17 | 75 | 97 | 3 | F | Mt. Wilson. |
| | | 6576 | −49 | 114 | +13 | 49 | 485 | 30 | | |
| | | 6577 | −43 | 120 | −31 | 55 | 73 | 1 | | |
| | | 6576 | −39 | 124 | +13 | 39 | 533 | 25 | | |
| | | 6572 | +5 | 158 | −7 | 15 | 145 | 2 | | |
| | | (*) | +7 | 170 | −26 | 35 | 12 | 4 | | |
| | | 6570 | +11 | 174 | +13 | 13 | 12 | 3 | | |
| | | 6567 | +35 | 198 | −19 | 43 | 436 | 20 | | |
| | | 6574 | +39 | 202 | +17 | 40 | 339 | 25 | | |
| | | 6566 | +60 | 223 | +16 | 60 | 73 | 2 | | |
| | | 6565 | +63 | 226 | −13 | 66 | 97 | 9 | | |
| | | | | (163) | (+7) | | 2,302 | 124 | | |
| Aug. 19 | 13 25 | 6579 | −84 | 66 | +13 | 82 | 24 | 1 | P | Do. |
| | | 6578 | −61 | 89 | −19 | 65 | 48 | 2 | | |
| | | 6576 | −37 | 113 | +13 | 36 | 485 | 20 | | |
| | | 6577 | −31 | 119 | −31 | 48 | 121 | 1 | | |
| | | 6576 | −28 | 122 | +12 | 27 | 582 | 12 | | |
| | | 6572 | +8 | 158 | −7 | 16 | 145 | 4 | | |
| | | 6570 | +22 | 172 | +15 | 23 | 12 | 2 | | |
| | | 6567 | +48 | 198 | −19 | 53 | 436 | 14 | | |
| | | 6574 | +53 | 203 | +17 | 54 | 291 | 15 | | |
| | | 6566 | +71 | 221 | +17 | 70 | 73 | 1 | | |
| | | | | (150) | (+7) | | 2,217 | 72 | | |
| Aug. 20 | 11 43 | 6579 | −70 | 68 | +13 | 69 | 291 | 14 | F | U. S. Naval. |
| | | 6578 | −48 | 90 | −19 | 53 | 24 | 4 | | |
| | | 6576 | −24 | 114 | +13 | 25 | 679 | 25 | | |
| | | 6577 | −19 | 119 | −32 | 43 | 48 | 2 | | |
| | | 6576 | −14 | 124 | +12 | 15 | 679 | 13 | | |
| | | 6572 | +22 | 166 | −8 | 26 | 339 | 13 | | |
| | | 6567 | +62 | 200 | −19 | 66 | 582 | 17 | | |
| | | 6574 | +62 | 200 | +16 | 63 | 97 | 5 | | |
| | | 6574 | +70 | 208 | +16 | 70 | 194 | 2 | | |
| | | 6566 | +88 | 226 | +16 | 82 | 97 | 1 | | |
| | | | | (138) | (+7) | | 3,030 | 96 | | |
| Aug. 21 | 11 56 | 6579 | −57 | 67 | +13 | 56 | 485 | 19 | G | Do. |
| | | 6578 | −11 | 113 | +13 | 13 | 679 | 56 | | |
| | | 6577 | −7 | 117 | −32 | 39 | 97 | 1 | | |
| | | 6576 | −2 | 122 | +12 | 5 | 679 | 28 | | |
| | | 6572 | +35 | 159 | −8 | 37 | 291 | 6 | | |
| | | 6567 | +76 | 200 | −20 | 75 | 582 | 2 | | |
| | | 6574 | +77 | 201 | +16 | 76 | 97 | 3 | | |
| | | 0574 | +86 | 210 | +16 | 86 | 194 | 1 | | |
| | | | | (124) | (+7) | | 3,104 | 116 | | |
| Aug. 22 | 11 0 | 6581 | −88 | 24 | −11 | 86 | 48 | 1 | G | Do. |
| | | 6579 | −43 | 69 | +13 | 43 | 436 | 15 | | |
| | | 6580 | −41 | 71 | −20 | 48 | 24 | 8 | | |
| | | 6576 | −2 | 110 | +15 | 10 | 145 | 15 | | |
| | | 6576 | +2 | 114 | +13 | 8 | 436 | 35 | | |
| | | 6577 | +6 | 118 | −32 | 39 | 97 | 1 | | |
| | | 6576 | +12 | 124 | +11 | 13 | 630 | 5 | | |
| | | 6572 | +49 | 161 | −8 | 50 | 242 | 1 | | |
| | | | | (112) | (+7) | | 2,058 | 81 | | |
| Aug. 23 | 11 34 | 6581 | −75 | 23 | −12 | 76 | 267 | 1 | G | Do. |
| | | 6582 | −71 | 27 | −12 | 73 | 24 | 8 | | |
| | | 6579 | −30 | 68 | +13 | 31 | 315 | 5 | | |
| | | 6580 | −28 | 70 | −21 | 34 | 24 | 3 | | |
| | | 6576 | +12 | 110 | +15 | 15 | 73 | 8 | | |
| | | 6576 | +17 | 115 | +13 | 18 | 339 | 21 | | |
| | | 6577 | +20 | 118 | −32 | 41 | 97 | 2 | | |
| | | 6576 | +26 | 124 | +12 | 27 | 582 | 9 | | |
| | | 6572 | +62 | 160 | −8 | 64 | 291 | 1 | | |
| | | | | (98) | (+7) | | 2,012 | 58 | | |
| Aug. 24 | 11 13 | 6581 | −61 | 24 | −12 | 63 | 145 | 4 | VG | Do. |
| | | 6582 | −58 | 27 | −12 | 61 | 48 | 5 | | |
| | | 6579 | −17 | 68 | +13 | 17 | 291 | 7 | | |
| | | 6580 | −15 | 70 | −21 | 31 | 12 | 3 | | |
| | | 6583 | +16 | 101 | −14 | 26 | 12 | 6 | | |
| | | 6576 | +26 | 111 | +15 | 29 | 73 | 16 | | |
| | | 6576 | +28 | 113 | +13 | 28 | 242 | 14 | | |
| | | 6577 | +32 | 117 | −32 | 48 | 97 | 1 | | |
| | | 6576 | +39 | 124 | +12 | 39 | 582 | 6 | | |
| | | 6572 | +74 | 159 | −9 | 76 | 291 | 1 | | |
| | | | | (85) | (+7) | | 1,793 | 63 | | |

POSITIONS AND AREAS OF SUN SPOTS—Continued

| Date | Eastern standard time | | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h* | *m* | | ° | ° | ° | ° | | | | |
| Aug. 25 | 11 | 51 | 6581 | −49 | 23 | −12 | 51 | 194 | 11 | VG | Mt. Wilson. |
| | | | 6582 | −42 | 30 | −13 | 56 | 73 | 15 | | |
| | | | 6579 | −3 | 69 | +13 | 7 | 242 | 13 | | |
| | | | 6580 | −2 | 70 | −21 | 27 | 6 | 4 | | |
| | | | 6583 | +30 | 102 | −13 | 36 | 48 | 6 | | |
| | | | 6576 | +42 | 114 | +13 | 41 | 145 | 8 | | |
| | | | 6577 | +46 | 118 | −32 | 56 | 97 | 1 | | |
| | | | 6576 | +52 | 124 | +13 | 61 | 533 | 8 | | |
| | | | | | (72) | (+7) | | 1,338 | 66 | | |
| Aug. 26 | 11 | 40 | 6585 | −73 | 345 | −17 | 70 | 436 | 17 | VG | U. S. Naval. |
| | | | 6584 | −60 | 358 | +7 | 60 | 24 | 5 | | |
| | | | (*) | −55 | 3 | −5 | 54 | 24 | 5 | | |
| | | | 6581 | −34 | 2[illegible] | −12 | 37 | 218 | 16 | | |
| | | | 6582 | −28 | 30 | −13 | 33 | 97 | 10 | | |
| | | | 6579 | +10 | 68 | +13 | 12 | 242 | 12 | | |
| | | | 6580 | +13 | 71 | −21 | 29 | 12 | 7 | | |
| | | | 6576 | +53 | 111 | +16 | 53 | 48 | 12 | | |
| | | | 6576 | +55 | 113 | +12 | 35 | 133 | 3 | | |
| | | | 6577 | +59 | 117 | −32 | 65 | 97 | 1 | | |
| | | | 6576 | +66 | 124 | +12 | 64 | 582 | 10 | | |
| | | | | | (58) | (+7) | | 1,913 | 98 | | |
| Aug. 27 | 9 | 14 | 6586 | −67 | 340 | −9 | 68 | 242 | 19 | VG | Mt. Wilson. |
| | | | 6585 | −60 | 347 | −17 | 62 | 679 | 46 | | |
| | | | 6584 | −47 | 0 | +7 | 47 | 36 | 8 | | |
| | | | 6581 | −22 | 25 | −12 | 27 | 145 | 25 | | |
| | | | 6582 | −16 | 31 | −12 | 25 | 97 | 21 | | |
| | | | 6579 | +23 | 70 | +13 | 22 | 145 | 9 | | |
| | | | 6576 | +66 | 113 | +12 | 65 | 97 | 4 | | |
| | | | 6577 | +69 | 116 | −32 | 73 | 97 | 5 | | |
| | | | 6576 | +79 | 126 | +12 | 77 | 388 | 6 | | |
| | | | | | (47) | (+7) | | 1,926 | 143 | | |
| Aug. 28 | 11 | 4 | 6587 | −80 | 312 | −8 | 79 | 97 | 2 | F | Do. |
| | | | 6586 | −52 | 340 | −9 | 53 | 242 | 16 | | |
| | | | 6585 | −47 | 345 | −16 | 50 | 582 | 48 | | |
| | | | 6581 | −9 | 23 | −12 | 19 | 48 | 18 | | |
| | | | 6582 | −2 | 30 | −11 | 17 | 12 | 8 | | |
| | | | 6579 | +37 | 69 | +13 | 37 | 121 | 6 | | |
| | | | 6576 | +80 | 112 | +12 | 78 | 73 | 3 | | |
| | | | | | (32) | (+7) | | 1,175 | 101 | | |
| Aug. 29 | 11 | 0 | 6587 | −67 | 312 | −8 | 65 | 109 | 2 | VG | U. S. Naval. |
| | | | (*) | −61 | 318 | +14 | 72 | 24 | 4 | | |
| | | | 6585 | −43 | 336 | −16 | 47 | 12 | 1 | | |
| | | | 6586 | −42 | 337 | −9 | 43 | 242 | 2 | | |
| | | | 6586 | −35 | 344 | −8 | 36 | 145 | 13 | | |
| | | | 6585 | −33 | 346 | −16 | 39 | 1,212 | 55 | | |
| | | | 6581 | +7 | 26 | −12 | 19 | 48 | 8 | | |
| | | | 6581 | +11 | 30 | −9 | 18 | 12 | 2 | | |
| | | | 6579 | +52 | 71 | +13 | 52 | 194 | 3 | | |
| | | | | | (19) | (+7) | | 1,998 | 90 | | |
| Aug. 30 | 11 | 0 | 6587 | −53 | 313 | −8 | 52 | 97 | 5 | G | Do. |
| | | | 6586 | −28 | 338 | −9 | 32 | 242 | 3 | | |
| | | | 6586 | −23 | 343 | −8 | 26 | 242 | 22 | | |
| | | | 6585 | −18 | 348 | −16 | 27 | 1,454 | 70 | | |
| | | | 6589 | −13 | 353 | +7 | 12 | 36 | 7 | | |
| | | | 6589 | −8 | 358 | +7 | 8 | 24 | 5 | | |

POSITIONS AND AREAS OF SUN SPOTS—Continued

| Date | Eastern standard time | | Mount Wilson group No. | Heliographic: Difference in longitude | Heliographic: Longitude | Heliographic: Latitude | Heliographic: Distance from center of disk | Area of spot or group | Spot count | Plate quality | Observatory |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | *h* | *m* | | ° | ° | ° | ° | | | | |
| Aug. 30 | 11 | 0 | 6588 | −8 | 358 | +27 | 23 | 97 | 14 | G | U. S. Naval. |
| | | | (*) | +26 | 32 | −8 | 27 | 12 | 4 | | |
| | | | 6579 | +66 | 72 | +13 | 64 | 194 | 3 | | |
| | | | | | (6) | (+7) | | 2,398 | 133 | | |
| Aug. 31 | 11 | 3 | 6591 | −81 | 272 | +5 | 81 | 145 | 1 | VG | Do. |
| | | | 6587 | −41 | 312 | −8 | 43 | 145 | 13 | | |
| | | | 6586 | −15 | 338 | −8 | 20 | 194 | 14 | | |
| | | | 6586 | −9 | 344 | −8 | 16 | 194 | 45 | | |
| | | | 6585 | −6 | 347 | −15 | 22 | 2,036 | 74 | | |
| | | | 6589 | 0 | 353 | +7 | 0 | 12 | 3 | | |
| | | | 6588 | +3 | 356 | +29 | 23 | 12 | 4 | | |
| | | | 6588 | +7 | 0 | +27 | 24 | 48 | 5 | | |
| | | | 6590 | +44 | 37 | −5 | 45 | 6 | 1 | | |
| | | | 6579 | +79 | 72 | +13 | 78 | 145 | 4 | | |
| | | | | | (353) | (+7) | | 2,937 | 164 | | |

Mean daily area for 31 days=2,589.
* Not numbered.
Plate quality: P, poor; F, fair; G, good: VG, very good.

## PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR AUGUST 1939

[Dependent alone on observations at Zurich]

[Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich Switzerland]

| August 1939 | Relative numbers | August 1939 | Relative numbers | August 1939 | Relative numbers |
|---|---|---|---|---|---|
| 1 | *Ecd* 67 | 11 | *aa* 157 | 21 | *b* 94 |
| 2 | 78 | 12 | *Mac* 170 | 22 | 86 |
| 3 | *Maac* 73 | 13 | *ad* 159 | 23 | *d* 72 |
| 4 | 94 | 14 | *a* 138 | 24 | 75 |
| 5 | *a* 90 | 15 | *Macd* 146 | 25 | *a* 58 |
| 6 | *d* 112 | 16 | 122 | 26 | *d* 69 |
| 7 | *Mbc* 106 | 17 | 128 | 27 | *Ec* 86 |
| 8 | *Edd* 141 | 18 | 111 | 28 | 85 |
| 9 | 157 | 19 | *a* 110 | 29 | 69 |
| 10 | *d* 157 | 20 | *d* 104 | 30 | *Mc* 76 |
| | | | | 31 | *b* 95 |

Mean, 31 days=105.8

*a*=Passage of an average-sized group through the central meridian.
*b*=Passage of a large group through the central meridian.
*c*=New formation of a group developing into a middle-sized or large center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central-circle zone.
*d*=Entrance of a large or average-sized center of activity on the east limb.

# AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By B. FRANCIS DASHIELL

Upper-air observations made during August by airplanes and radiosonde are given in tables 1 and 1a, respectively, while those made by pilot balloons are shown in tables 2 and 3. The resultant winds, as well as the mean free-air pressures and temperatures, are shown on charts VIII, IX, X and XI. Isentropic data are given on chart XII and the mean altitudes of the identified tropopauses are shown in table 4. Detailed explanations of these charts and tables will be found in the January 1939 issue of the MONTHLY WEATHER REVIEW.

Table 1 shows that airplane observations are made at 7 stations in the United States. These observations failed to indicate any unusual pressure, temperature or humidity means for August. The highest temperatures prevailed at 1.5, 3, 4 and 5 kilometers on the Pacific coast (Seattle, Wash., and San Diego, Calif.). Mean pressure was highest over Pensacola, Fla., at 1.5 and 3 kilometers, and over San Diego, Calif., at 4 and 5 kilometers. Humidities were highest over Lakehurst, N. J., and Washington, D. C., and lowest over Seattle, Wash.

The radiosonde observations given in table 1a, as well as the airplane flights in table 1, show that below-zero mean temperatures were not encountered until nearly 5 kilometers was reached over all stations, except Miami, Fla. At 5 kilometers lowest mean temperatures occurred over Billings, Mont. (−5.3° C.), while the highest was over Miami, Fla. (+0.8° C.). But above 5 kilometers, where all observations are made by radiosonde (table 1a), the lowest mean temperatures were found at the 16-kilometer level, except at 15 kilometers over Omaha, Nebr.,