

昭和 18 年 2 月 5 日の日食観測報告 (柿岡)

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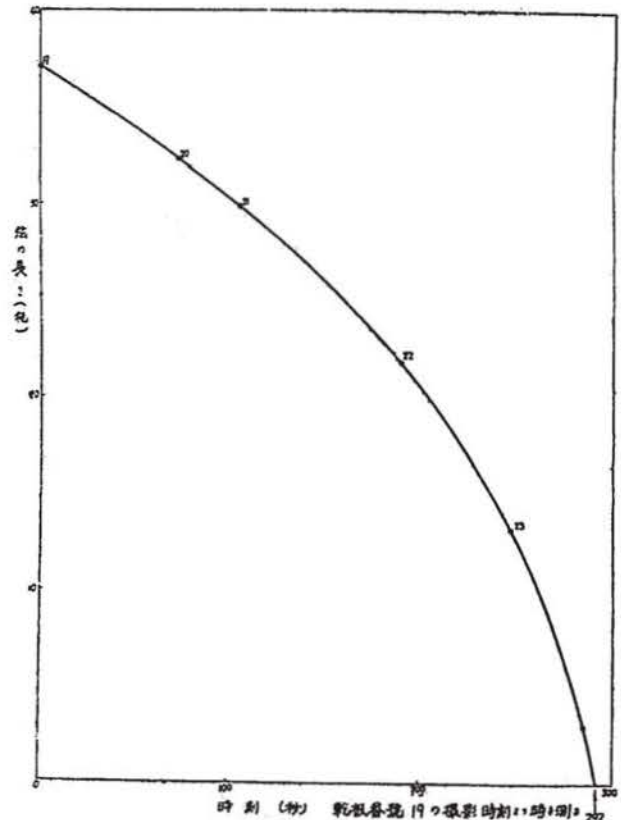
昭和 18 年 2 月 5 日の日食に際し柿岡地磁気観測所に於て 20 種赤道儀に依り虧けて行く太陽の寫眞を撮影し併せて復圓の時刻をなるべく正しく出さうといふ目的を以て復圓間際の寫眞を多數撮影したので、電磁気観測と獨立にこゝで簡単に報告する。

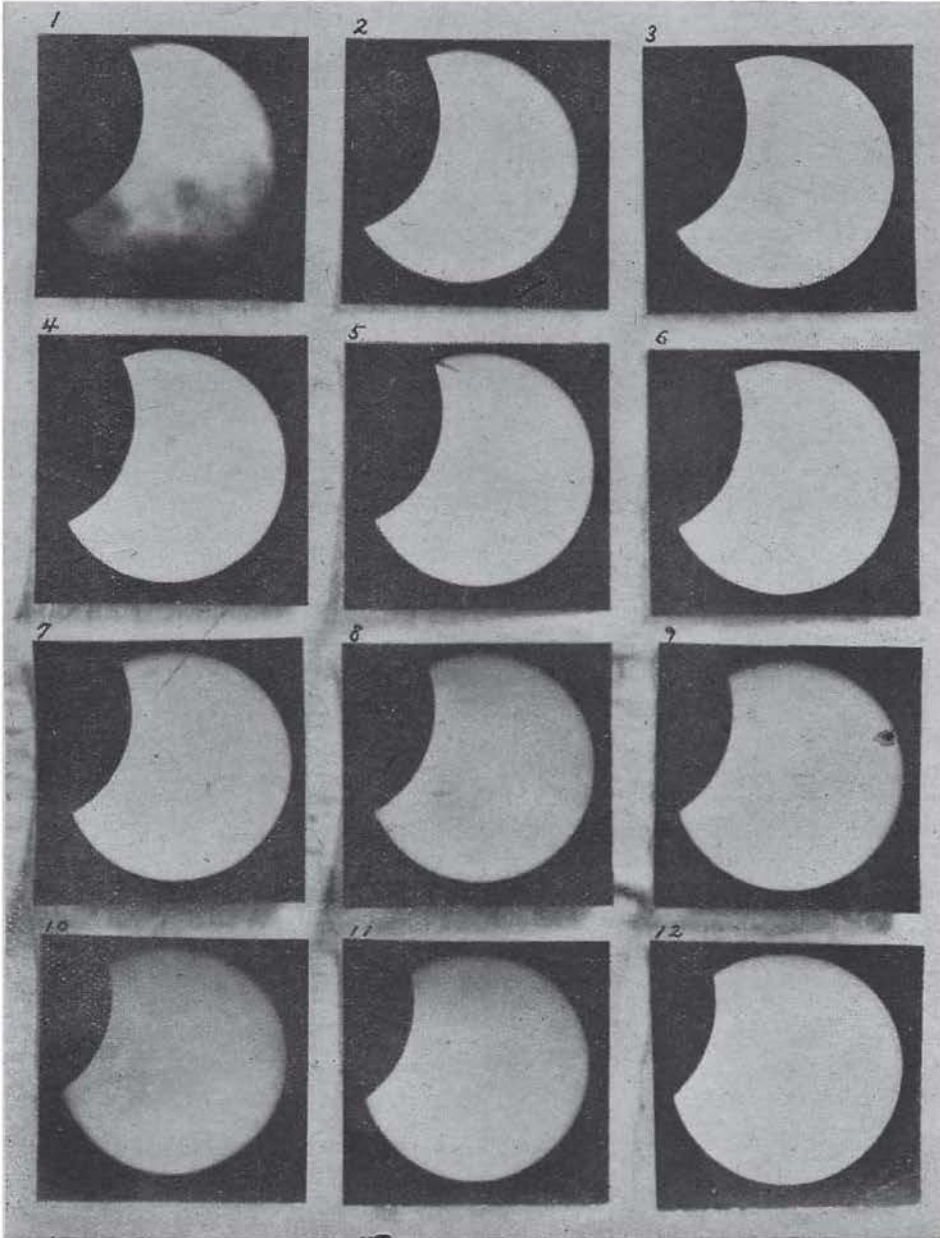
方法は約 200 米先のリーフラー振子時計に聯接するやうにしたクロノグラフのキーをシャッターを切ると同時に叩いて時を記録した。初虧、食甚附近は雲に蔽はれて観測不可能の止むなきに至り前途を危ぶまれたが復圓間近く 8 時 20 分頃より全く雲がなくなり合計 24 枚の寫眞を撮影した。撮影乾板はコムパレーターにて太陽の月によつて生ずる弦の両端の xy 座標を測つて弦の長さを出し、時刻を横軸に弦の長さを縦軸に曲線を書いて見た。乾板番號 19, 20, 21, 22, 23, 24 の 6 枚に就き描いたものを次表に掲げる。曲線が横軸と交りたる點の時刻を讀みて復圓の時刻にして 8 時 49 分 19 秒を得た。此處に柿岡地磁気観測所の位置は東徑 140 度 11 分、北緯 36 度 14 分である。

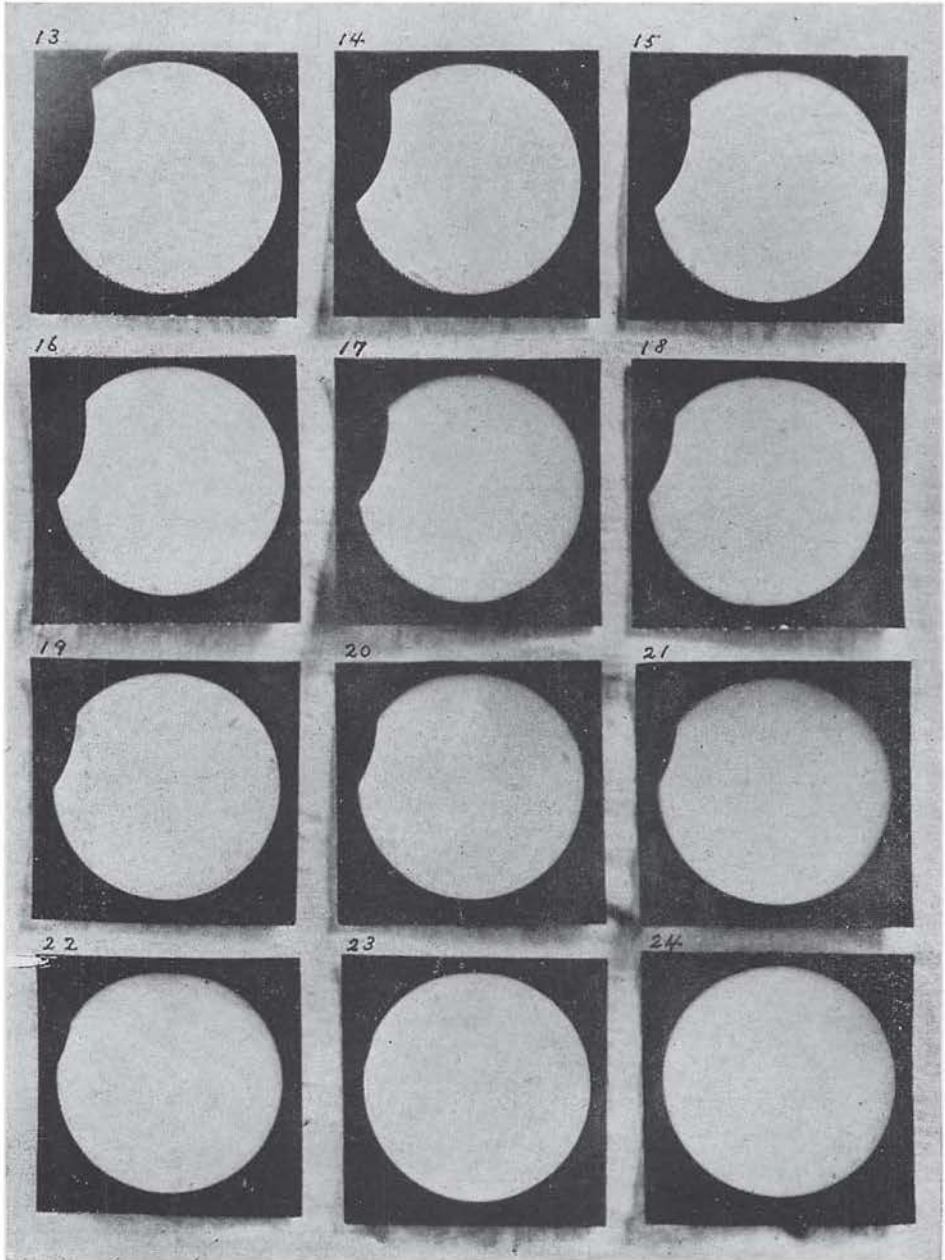
以上の方法では寫眞撮影に依つて曲線を書いて復圓の時刻を求めた次第であるが精度は恐らく 2 秒以内にあると思はれる。復圓間際では弦の両端の位置が正確には決定せられず、コムパレーターにて測定しても弦の長さの精度は辛うじて 0.1 耗にしか過ぎないのが精測の大きい障害となる。併し復圓間際の寫眞材料を

もつと多くすれば曲線の形狀のはつきりして 1 秒程度に時刻を決定することは出来ると思はれる。

現在に於ける如く精密豫報が數秒以内に行はれるものとすれば價值のある観測として精度が 1.2 秒のものであることが望まれるが、以上の寫眞撮影に依る方法に依りてこの目的は達せられること







が分る。然し普通になす如く口径 8 釐以上の望遠鏡を用ひ高倍率にて直視する方法を用ひる方が直接に観測せられる點が有利である。それにしてもその場合観測者の心理的影響が多分に手傳ふ場合には或ひは早く或ひは遅く讀み過ぎる量が 2, 3 秒以上にも達する恐れ

観測者	復圓時刻	寫眞観測との差
第 1 組	4時 49分 13.8秒	5 秒
第 2 組	49分 49 秒	14 秒
第 3 組	49分 0 秒	19 秒
第 4 組	48分 52 秒	27 秒
第 5 組	48分 50 秒	29 秒
第 5 組均	49分 0 秒	19 秒

がないでもない。かゝる場合同じ場所で數人が以上の直視の方法を實行した上でそれらの結果の平均を取れば非常によい結果が得られることと思ふ。

柿岡地磁氣観測所員の方々に参考迄に燻煙せる硝子フィルターを用ひ復圓の時刻の肉眼観測をしてもらつたが其の結果は次表の如く寫眞観測による結果とを比較して見ると肉眼に依れば何れも早過ぎて観測してゐることが分る。これはこの様な簡単な方法では最後の瞬間迄見とゞけることが出来ぬためと思はれる。平均の復圓時刻 8 時 49 分 0 秒に於ける月に依る太陽の弦の長さは角度に直せば大約 2 分であり 8 時 49 分 13.8 秒に於ける弦の長さは大約 1 分である。

人間の眼の分解能が通常 1 分又は 2 分であることを思ひ合せれば以上が説明出来る。かく復圓の肉眼に依る観測は眞の値より數秒乃至 30 秒も早くなるから肉眼に依るこの種観測値は大體に於て分の程度迄は正しいと言へる。

尙これら観測者の観測能力は區々のものであることを注意しておく。

次に寫眞撮影時刻及び寫眞を掲げる

番 號	撮 影 時 刻	番 號	撮 影 時 刻	番 號	撮 影 時 刻	番 號	撮 影 時 刻
1	8時 19分 55.02秒	7	8時 29分 4.45秒	13	8時 37分 50.56秒	19	8 時 44 分 27.00秒
2	22 9.66	8	29 56.42	14	39 16.80	20	45 40.02
3	23 45.43	9	32 47.27	15	39 53.77	21	46 13.37
4	25 28.02	10	34 29.86	16	41 32.04	22	47 38.09
5	27 5.70	11	36 11.82	17	42 3.43	23	48 35.22
6	27 43.32	12	37 11.05	18	43 41.91	24	49 12.12

終りに本観測に際し終始御助力を惜まれなかつた今道所長に深く感謝申し上げます。又種々御忠言を頂いた吉松技師、乾板の入れ換へにお骨折いたゞいた吉成技師、クロノグラフ運轉に助力された菊池技師、並にお骨折頂いた堤、久保田及び録田の三君、池田、平兩嬢又肉眼観測を擔當して下さい下さつた方々に厚く御禮申し上げます。

(昭和 18 年 4 月)

Memoirs of the Kakioka Magnetic Observatory

Vol. IV, No. 2. June, 2603 (1943)

Abstract of Memoirs

On the Electricity on Rain (part I)

By S. KIKUTI.

Since Feb. 2601, the writer has carried out a measurement of the electricity on rain. As the first report we investigate the data from Feb. to Aug. of this year.

In ordinary rainfalls accompanied by atmospheric depression, the charge of both signs is about 0.1 e.s.u. per c.c. and not exceeds 0.5 e.s.u. per c.c. The current density due to the rainfall of this kind is in range from 10^{-12} to 10^{-13} amp. per square cm. Positively charged rains occur more frequently compared with negative ones.

In showers accompanied by fronts, the charge amounts over 1.0 e.s.u. and it occurs rarely more than 20 e.s.u. per c.c. The current density of this case is the order of 10^{-13} amp. per square cm.

The charge observed in rainy season is about 0.01 e.s.u. per c.c. and smaller than that of ordinary rainfalls.

When rainfall exceeds 1.5 c.c. per min., zero or negative charge is so slightly that we can not observed it, while positive charge shows a lower value in rainfall from 0.5 to 1.5 c.c. per min. and when it exceeds 1.5 c.c. per min., the charge tends to increase with rainfall.

As to the relation with the potential gradient, it is a predominant tendency in our case that the negative potential is exclusively accompanied by positively charged rain, while in the foreign countries the negative charge is also observed.

On the Mechanical Collector

By M. MISAKE.

In summer of 2601, two kinds of mechanical collectors designed by Mr. Y. Yokouti were installed at this observatory. Their constructions and some observed data are reported.

In the first type, the shielding plate is rotated over the two insulated plates which take the surface charge proportional to the existing earth's field when they are exposed. On the contrary, the insulated plate of the second type rotates under the fixed shielding which has two apertures. The former is shown in Fig. 1, and the latter in Fig. 7.

On the Atmospheric Potential Gradient at the Top of the Hill, "Kakioka Fujiyama"

By S. KIKUTI.

From Nov. 2600 to Mar. 2601, the writer carried out a measurement of the potential gradient near the earth's surface at the top of the hill so-called "Fujiyama". The observing point is located about 1 km. southward from this observatory. This hill stands alone at somewhat south from the center of the Kakioka basin. The top of the hill is flat and forms the circular ground about 30 m. in diameter, surrounded with pine trees excepting for northside, their height being nearly equal to the level of the top. The observing point is at an elevation of 128 m. above the sea level and about 100 m. higher than this observatory.

As the measuring apparatus, a Benndorff's selfrecording electrometer was used with a radio thorium collector which was apart 103 cm. from the wall and 198 cm. above the ground. Its reduction factor to a flat place is 1.23. On the other hand, at this observatory a water dropper collector is used which is 135 cm. apart from the wall and 200 cm. above the ground. Its reduction factor is 1.32.

From the results of the simultaneous observations we obtained, as an average value, 186.5 V/m at the hill and 150.5 V/m at this observatory. The former is 1.29 times as large as the latter, but the hourly ratios between them change considerably and the average ratio from 11 h to 16 h is 1.65.

It must be noticed that the value of the morning maximum at the hill is rather smaller than that at this observatory.

The diurnal variation in a fine weather shows the double maxima-type at both places, but there are some differences as below mentioned;

- (1) The amplitude at the hill is smaller than that at this observatory, that is, in the latter the morning maximum develops predominantly than evening maximum, while in the former these maxima being nearly equal.
- (2) The time of maximum in the morning at the hill is tending to retard about one hour than that at this observatory, while the evening maximum occurs almost the same time at both places.

Such differences may be attributed to those of the meteorological conditions at both places, especially to that the reversed state in the atmosphere near the top of the hill breaks earlier than that at this observatory.

The writer also discussed the diurnal variations on cloudy days and the potential variations during rainfalls.

The Earth's Magnetism and Earthquake (I)

By T. YOSIMATU.

(1) The world-wide distribution of the so-called foci of the secular variation of the earth's magnetism is well related to that of the land and ocean, and a more close investigation, considering the distribution of the principal earthquake zones, suggests a possible cause of these secular variations due to the induction by the present general field.

(2) The annual means of both horizontal and vertical intensities at the Kakioka and Toyohara Magnetic Observatories are statistically investigated from the point of view that some of local magnetic disturbances in the vicinity of the active crustal deformation should be expected to relate to the occurrence of earthquakes. The result obtained is just so that the general investigation of the secular variation must be attacked at first from this consideration.

On the Eruptive Solar Prominence on Mar. 4, 2603, and
the Group of the Sun-Spot, No. 2832.

By T. OSAWA.

Some observed facts are reported on a moderate but eruptive prominence appeared on the east limb of the sun disk and the associated sunspot, including their possible effects upon the earth's magnetic activity.

A Report of some Solar Measurements during the
Solar Eclipse, of Feb. 5, 2603.

By T. OSAWA

On the occasion of the total solar eclipse, a photographic measurement of the time of the end of the eclipse and others are reported. The error of the present photographic method is probably within the limit of two seconds of time.
