

Japanese "Koji."

IN the current number of NATURE (p. 469) is a note upon the preparation of Japanese *koji*, taken from the American Consular Reports.

In NATURE, vol. xxiv. p. 468, will be found a report of a paper read before the British Association on this subject, supplemented in the following number (p. 509) by a letter from the author giving more details. The whole subject was exhaustively treated in a paper on "The Diastase of Koji," read before the Royal Society in 1881, and also in a memoir on "*Sake-brewing*," published by the University of Tokio in the same year. Further, an abstract of the latter appeared in the *Chemical News*, November 11, 1881, p. 230.

I shall feel obliged if you will insert this letter, as most people, on reading the note in NATURE, would be led to think that Prof. Georgeson had made observations which were previously unknown. This is not the case. R. W. ATKINSON.

44 Loudoun Square, Cardiff,
March 18.

THE TOTAL SOLAR ECLIPSE OF JANUARY 1.

BY the kindness of Mr. Todd we are enabled to give a drawing summarizing in a general way the phenomena observed during the last total eclipse. A comparison of this with the records at the two preceding sun-spot minima indicates very clearly that we have now very definite information concerning the corona of the sun as observed at the minimum period of sun-spots.

Everything written relating to the form of the corona in 1878 is now strengthened by still another critical observation at the succeeding minimum. It remains to be seen whether the same marked absence of bright lines in the coronal spectrum has been noted.

Here is an extract from what I wrote in 1878:—

"The utter disappearance of the large bright red corona of former years in favour of a smaller and white one in this year of minimum, struck everybody. Indeed it is a remarkable thing that after all our past study of eclipses, this last one should have exhibited phenomena the least anticipated. It isolates the matter that gives us a continuous spectrum from the other known gaseous constituents. The present eclipse has accomplished if nothing else, the excellent result of intensifying our knowledge concerning the running down of the solar energy. With the reduction of the number of spots or prominences for the last four years, the terrestrial magnetism has been less energetic than it has been for the preceding forty years, while at both ends of this period we have had famines in India and China.

"As the sun is the great prime mover of earth, and as every cloud, every air current depends upon it, its present quiet condition is worthy of the most minute study.

"The absence of lines from the corona spectrum shows a great reduction in the temperature of the sun, and such a marked change in the sun should produce a corresponding change on the earth, so that the associated

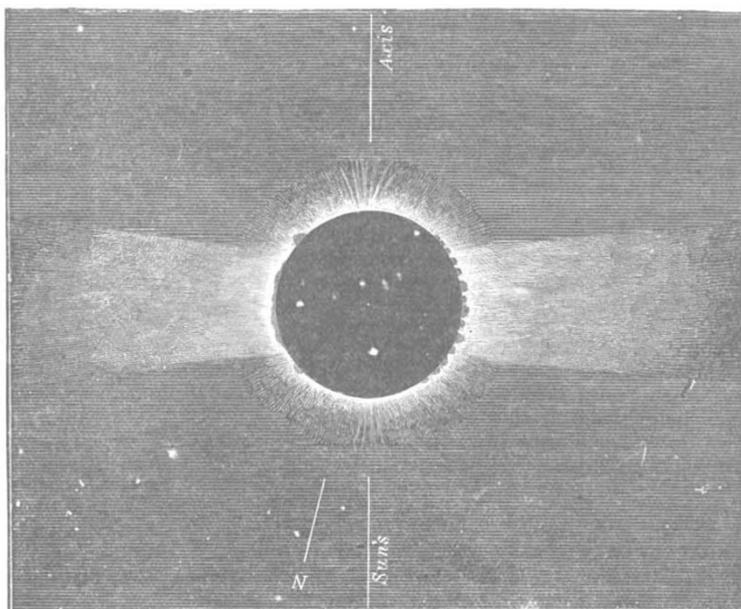


FIG. 1.—The equatorial extension and Polar tracery observed at the minimum of 1867.

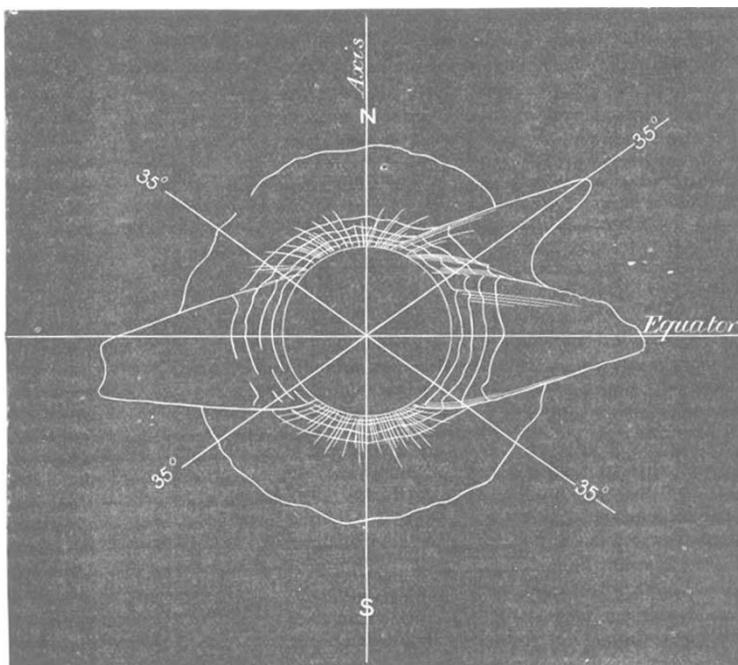


FIG. 2.—Tracing of the results obtained by the cameras in 1878, showing inner portion of equatorial extension, and how the surfaces of it cut the concentric atmosphere in lat. 35° N. and S., or thereabouts.

terrestrial phenomena should be carefully observed. Hence I regard this eclipse as the most important that has been observed for many years, as it throws much-

needed light on many points hitherto obscured in doubt."

The similarity of the coronas of 1867 and 1878 was one of the points relied upon when I subsequently discussed

(see "Chemistry of the Sun") the possible meteoric origin of many solar phenomena, and pointed out that if this were so, there must be an equatorial ring to produce them. The recent development of the meteoric theory suggests that

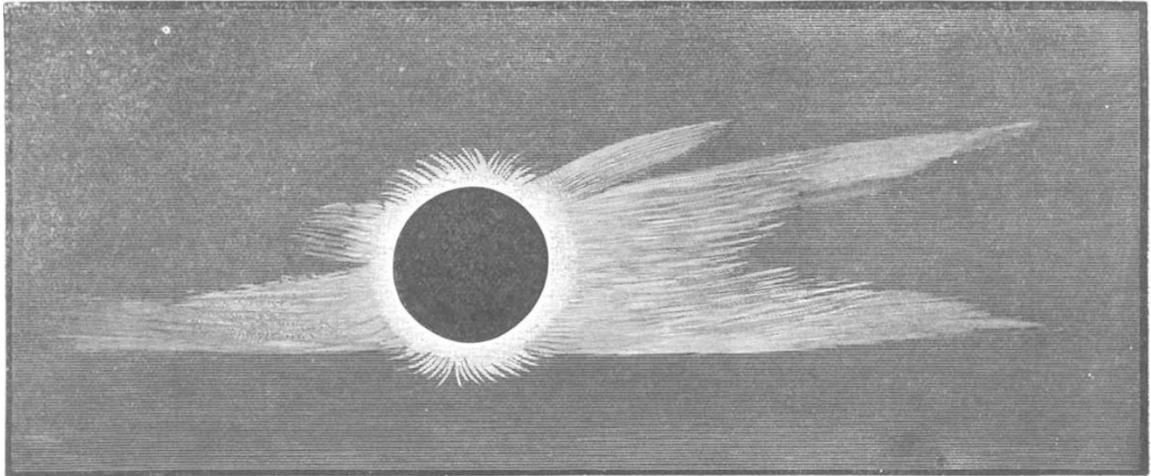


FIG. 3.—Phenomena observed during the total solar eclipse of January 1, 1889 (see NATURE, March 7, p. 436).

among the most important observations to be made at future eclipses will be a direct comparison of the spectrum of the corona with the low temperature spectrum of meteoritic dust. It may be that some of the photo-

graphs taken during the last eclipse may give us some information on this point, but so far nothing is known.

J. NORMAN LOCKYER.

ON THE GRADUAL RISING OF THE LAND IN SWEDEN.

ALTHOUGH we find in a work by Urban Hjärne, printed in 1702, some remarks on the level of the sea in the Baltic, and the old shore-lines of the island of Gothland, the honour of having for the first time raised this question seriously, and of having subjected it to scientific investigation, belongs to Emanuel Swedenborg, who, in 1719, published a work entitled "On Proofs from Sweden of the Level of the Sea, and the Past World's Strong Flood and Ebb." From the condition of the rocks in West Gothia; from fossils in horizontal chalk and marl beds; from shell-banks situated high above the actual level of the sea; from skeletons of whales and wrecks of ships found far inland; from the structure of the sand-hills and from the round stones found therein; from erratic blocks (or, as Swedenborg calls them, "stones that are spread all over the world"); from giants' bowls; from the shore-lines on Halle and Hunneberg (mountains in West Gothia); from the species of fishes existing in lakes at great elevations; and, finally, from the many proofs of the fall of the sea-level in the Baltic,—from all this, Swedenborg drew the conclusion that the former level of the sea in Sweden was some 400 feet above the present one. These changes he attributed in part to an alteration in the velocity of the earth's rotation and the period of rotation of the moon, whereby the water at the Pole is forced towards the equator. He also assumed that as the Baltic lies at a higher level than the Western Sea, the water therein gradually decreases.

Swedenborg's work, which suggested many points respecting the history of the world that have been hotly debated to the present day, was at first not understood, and continued to be almost ignored by the scientific world. But it was the immediate cause of analogous

researches begun by Prof. Anders Celsius, in 1724, along the coast of the Baltic, the results of which he embodied in a paper published, in 1743, in the Proceedings of the Royal Academy of Sciences, entitled "Remarks on the Decrease of the Water in the Baltic, as well as in the Western Sea."

Setting aside all other periods dealt with by Swedenborg, Celsius devotes himself exclusively to the changes in the sea-level which have taken place in historical times. He adduces several examples, tending to show that harbours and roadsteads on our shores have become shallow, and that rocks have gradually risen above sea-level; that ample depth for seine-fishing existed where there is now a shallow; that the appellations "island" and "holm" are frequently used on the coast for uplands surrounded by lowlands, the name "sound" for bights or dry land; that flat rocks at the level of the sea, formerly valuable on account of seals gathering therein, have become valueless by having risen too high above the sea; and that anchors and wrecks have been found in inland peat-bogs. He further compares measurements of the rising of the land extending over 168 years, and comes to the conclusion that at Gefle (on the Baltic), during 100 years, the land rose from 41 to 47½ inches, and, on the opposite side of the Bothnia Sea, from 41 to 50 inches, being an average of 45 inches. Celsius also proves a similar rising on the west coast, and from these facts he infers that the entire Scandinavian peninsula is gradually rising. Celsius further calculates the area of the land thus won from the sea since the days of Pytheas, and finally, for the benefit and instruction of coming generations, has a rock at Löfgrundet, off Gefle, carefully marked, this being the first scientific water-marking of the rising of the land in Sweden. As regards the fall of the sea, Celsius is of opinion that it is partly due to the transformation of water into earth through plants, and partly to the flowing