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THE TOTAL ECLIPSE OF AUGUST 19.

The weather in the European region of the path of totality of the solar eclipse was all that could be asked for during several weeks previous to the coming of the eventful day. The sky was cloudless, the atmosphere pure and dry, and the conditions were perfect with the exception of a few passing storms. A few days before the eclipse, there came a change; violent storms raged, and a center of barometrical depression held sway over western Europe. On the morning of the 19th, a thick veil of clouds extended over the whole European line of the central eclipse, and concealed the glorious spectacle from sight, except in a few instances through breaks in the clouds. Words are powerless to express the disappointment of the enthusiastic observers stationed on the route or the loss to science caused by the intervention of the unwelcome clouds. A few glimpses of the contacts were obtained, the spectroscope was successfully used, darkness reigned during the period of totality, the clouds took on brilliant hues, and some adventurous Russian astronomers mounted in balloons above the clouds to behold the grand phenomenon.

An observer in Elpatievo Narischkine, in the Russian province of Vladimir, the town being in longitude 35° 17′ east of Paris, and in latitude 56° 57′ north, gives a graphic narration of his own experience in a letter to the editor of *L'Astronomie*. We translate it for the simplicity and vividness of his account of the superb spectacle, and for his exceptional good fortune in beholding it.

19 Aug. 1887, 8 h. A. M.

M. LE DIRECTEUR:

The weekly courier starts in five minutes. I hasten to tell you in a few words how greatly I was favored by the weather, which was frightful last evening. The clouds broke away, and the sun shone only from the time of the commencement of the eclipse to its close. This is what I observed according to local time. I used a Bardou refractor of about three inches aperture, with an eyepiece magnifying twenty-five times. The telescope was ordered for this special use.

At 5 h. 45 m., local time, the sun emerges from the clouds, and presents on its surface two spots of small extent. The first contact takes place at 5 h. 53 m. At 6 h. 18 m., the first or western spot is touched by the border of the moon; at 6 h. 27 m. 30 s., the second spot is covered. The second contact takes place at 6 h. 52 m. 31 s. Immediately I perceive four rosy protuberances, producing a wonderful effect, placed respectively at 100°, 180°, 220°, and 240°.

They are the only ones I see, deeply impressed as I was by the unheard-of magnificence of the spectacle. The silvery corona of the sun far surpasses any idea I had formed of its exceeding beauty. Those who surround me are full of emotion, and an entire silence reigns over the country. I see two stars. The one at the zenith is Regulus, the other is Mercury, in a straight line between Regulus and the sun.

At 6 h. 54 m. 45 s., a ray of light flashes from the sun, we draw a long breath, everything resumes its course in the suspended life of terrestrial nature. The western spot reappears at 7 h. 18 m. 30 s. The second spot is seen at 7 h. 28 m. Finally, at 7 h. 53 m., the last contact takes place, the clouds resume possession of the eastern sky, and there is every prospect of the continuation of the unfavorable weather.

If the distinguished astronomers stationed in Russia had been as fortunate as I was, the science that you make so popular would have gained greatly from the number and variety of the observations made.

H. URECH.

THE HUMOROUS SIDE OF THE ECLIPSE.

A spectacle as awe-inspiring as a total eclipse has its humorous side. At Berlin, the sun rose eclipsed, and eclipse trains were organized to enable the people in the vicinity to behold the phenomenon. The sky, however, at the time, was covered with impenetrable clouds, and the occupants of the eclipse trains were greatly disappointed. A countryman in the suburbs of Berlin hastened to put up a placard announcing that, on account of the bad weather, the eclipse would be put off until Sunday.

The governor of Moscow, knowing the ignorance of the people over whom he held sway, issued the following circular, which was distributed through the whole province: "The *moujiks* must not be frightened if, a few moments after the eclipse, they see falling from the sky a round mass supporting men. This mass, called a balloon, has been made use of for carrying astronomers high enough in the air to enable them to study the eclipse without being prevented by the clouds."

M. FAYE, the well-known French astronomer, has drawn attention at a recent meeting of the French Academy of Sciences to the apparent geological law that the cooling of the terrestrial crust goes on more rapidly under the sea than with a land surface. Hence he argues that the crust must thicken under oceans at a more rapid rate, and so give rise to a swelling up and distortion of the thinner portions of the crust, in other words, to the formation of mountain chains.

Zinc Etching.

A zinc plate having a smooth polished surface is taken, and upon it is drawn the required design with an ink composed of asphaltum, turpentine, and oil (enough to keep the composition in a liquid state), and a little lampblack to darken it. Or, if the object to be reproduced be an engraving, either stone, plate, wood, or any other material, it is transferred by the usual mode; that is, by taking an impression from the engraving on "transfer paper," and thence to the zinc plate.

The transfer ink used is a compound of ordinary lithographic printing ink and asphaltum, in the proportion of about one-third of the latter to two-thirds of ink. The drawing or transfer having been completed, and before the ink has become dry, it is covered with a coat of powdered resin or copal, the back of the plate being also coated with asphaltum to render it acid proof. The plate is now ready for the bath, which consists of muriatic acid of about 1·2 specific gravity (or other suitable acids either in their pure or diluted state, such as nitric acid, etc.), where it is allowed to remain about five seconds. It is then taken out, washed, dried, and, when dry, heated only enough to melt the powdered resin or copal, so as to form a crust which will protect the edges of the drawing or transfer which has been formed by the first exposure of the plate to the etching agent. The plate is next returned to the bath of muriatic acid, again allowed to remain about five seconds, and washed and dried once more. Those portions which are high enough to print are then covered with asphaltum, and another coat of powdered resin or copal is added, after which it is replaced in the bath and allowed to remain until sufficient depth is obtained on the exposed parts. These operations of covering the plate and returning to the acid may have to be repeated three or four times, according to the nature of the work. The plates used are, of course, restricted to such metals as are affected similar to zinc.

New Process for Tin Plates.

A patent has been recently granted to Mr. William H. Brown, of Jersey City, for a novel process of manufacturing continuous tin plates. The plates in question are made of steel, and the process consists in producing a sheet of steel of any continuous length and of required width by first rolling the metal hot and afterward rolling it cold, until a proper thickness and perfectly smooth surface is obtained. Next, the surface of the sheet is scoured, and then it is afterward passed through a bath of molten tin, thus receiving its coating. Finally, the sheet is subjected to a rolling operation, under heavy pressure, between highly polished rolls, by which the tin and steel are condensed and consolidated together, and the surface hardened and polished. The inventor states that by this method the tin will be found to be so hardened upon and incorporated with the steel as to produce a tin plate which is superior in most respects to any tin plate wherever produced, and which, owing to the homogeneous molecular structure of steel, differs essentially from any tinned iron plate, because the fibrous structure of the iron would render it impossible to subject it, after tinning, to such a heavy rolling as is here employed without it working its fibers into or through the tin in such a manner as to leave the tin very thin in some places, or breaking through it entirely. The purpose to which these plates are to be applied is the same as that for which tin plates are at present employed—namely, roofing, tinware, etc.

A New Bleaching Process.

Messrs. Jacobson Brothers, of Berlin, are stated to have discovered a new process for bleaching vegetable and animal fibers, which is likely to prove of great utility. Hitherto the use of oxygenated water for bleaching purposes has been very limited, as this product soon loses its efficacy if carried to any great distance. The inventors found that oxygenated water can, in most instances, be replaced with advantage by baths obtained by adding peroxide of barium to the solution of certain salts. The peroxide of barium is decomposed very slowly in the water, and throws off oxygen. These decoloring properties imparted to the saline solutions are, to a considerable extent, independent of the nature of the salts, and the most favorable results are obtained with alkaline silicates, the chloride of ammonium, and the alkaline borates. The chloride of magnesium and phosphate of soda act less powerfully, and still less the sulphates. The proportional weight of the salts, and the water in which they are dissolved, vary considerably, but a mixture of one part of peroxide of barium, one part of silicate of soda, and 100 parts of water is sufficient in most instances. A more concentrated solution may be employed for bleaching vegetable fibers, such as linen, jute, rags, paper pulp, etc., but in the case of animal fiber a stronger proportion of silicate might act prejudicially, owing to the alkali which is disengaged. For jute and linen the process requires one or two days. The peroxide of barium may be mixed with the silicate solution, or a mixture of pulverized peroxide of barium and silicate may be dissolved in water.