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SOMETHING ABOUT THE SUN.

Seldom has a total eclipse of the sun been viewed with such satisfaction as that which occurred on last New Year's Day. During the whole period of totality the view was not obscured by the smallest cloud, and over fifty photographs were secured by the scientific parties scattered among the mountains of Nevada and California for the purpose. The corona, it will be seen, was exceptionally fine, extending to over twice the solar diameter. Said one eye witness, in describing the wonderful sight, "If we further attempt a mental grasp of the complete effect of the moon's black globe hung in space, quite close with the chromospheric prominences or red tongues of luminous hydrogen; next beyond, the strong light of the corona proper; and outside still, the delicate, filmy, zodiacal streamers, stretching far out into space, we can realize the full justice of Professor Langley's apt remark that the astronomer, busied with his camera and telescope, may note with precision all the detail of this phenomenon, but the just appreciation of the grandeur of so sublime a spectacle presumes the imagination of a poet."

In this connection our young readers will be interested in a few words on the sun itself by W. Matthew Williams, a Fellow of the Royal Astronomical Society

The astronomers of old only knew that the sun is a great fiery globe, and that sometimes there are curious dark spots upon it which could be seen only in foggy weather or when the sun was near the horizon.

The reason why these spots were only seen at such times, is that the eye is then protected by the fog or the haze. When in full glare from a clear sky the sun dazzles the eyes so painfully that nothing but the dazzle can be seen. The telescope only makes this worse. It is, in fact, dangerous to look at the sun through a telescope in its ordinary condition.

At last somebody thought of a very simple contrivance, that of using dark colored glass to protect the eye, and thus we are now enabled to magnify the sun by the telescope, and examine its surface deliberately.

Before I tell you what has thus been discovered, I must try to convey some idea of the size of the sun. This is by no means easy. As the eye is dazzled by the brilliancy of the sun, and all the lights of this world appear but darkness after we have struggled for a while to fix our gaze upon the wondrous luminary, so is the mind bewildered when we contemplate his magnitude, and our own world and all upon it are dwarfed by comparison to insignificant littleness.

But how can we measure the size of the sun? is a natural and fair question. In reply, I may say that the distance of the sun from our world has been measured, and knowing this, it is easy to tell how much less than its real size must an object at that distance appear.

But how measure the distance? you will

now say. To answer this would require quite a long story of itself, a story of great interest, but one that can only be understood by those who have learned some mathematics.

To form some idea of how it has been done, place some small object a few feet from a window pane, then stand at the

further end of the room, and note the part of the window pane which the object appears to cover. Then step aside, say three feet to the right. The position of the object against the window pane will now appear to have changed,—moved to the left.

Note how much it has moved, then come nearer to the object, and step three feet to the right again. The object will have moved further to the left this time. Then come still nearer and repeat the experiment. The shifting of the apparent place of the object will be greater still.

The planet Venus is an object that sometimes comes between us and the sun, so as to be seen as a spot on the sun, as the object in your experiment appeared on the window pane. If an astronomer makes a long step, say from London to one of the islands in the Pacific, this spot will appear to change its position, but as he cannot make such a big step at once, he arranges that two or more persons shall make observations at the same time from distant parts of the world, and carefully record the exact, apparent position of the planet on the sun, or its apparent path across the sun, as seen from these stations.

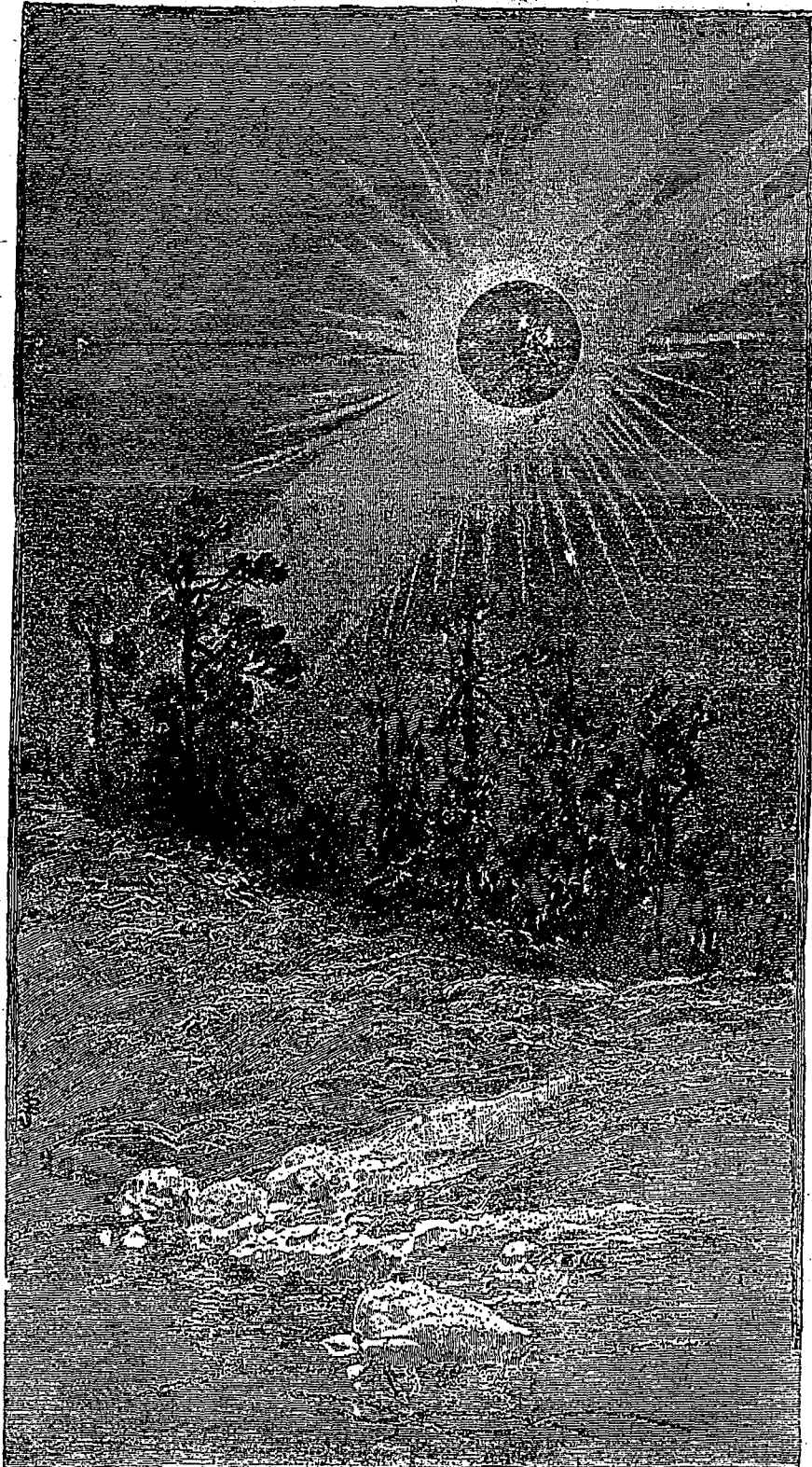
Captain Cook made one of his celebrated voyages for this purpose, and at different times all the civilized nations of the world have equipped expeditions at great expense to observe these transits of Venus, the object being to measure the distance of the sun.

Other methods have also been used, all with the greatest possible skill. Immense labor has been given to the calculations that are necessary in working out the gigantic sum which the observations have set.

Therefore, you may venture to believe me when I tell you that a comparison of all the results of these labors of so many able men during so many years proves that the sun is nearly ninety-three millions of miles from the earth, and that the fiery globe itself is so large that if a number of worlds as big as ours were held together like beads on a string, three hundred and forty of these world-beads would be required to girdle it around in one line.

Three hundred and forty pin's heads thus strung together would go round your head with some to spare. Therefore, the sun is as much bigger than the world as your head is bigger than a pin's head.

How many worlds would it take to cover the whole surface of the sun? As many as the number of pins to cover a pin-cushion as big as your head. How many worlds to fill the space occupied by the sun? This is easily calculated when we know the sun's diameter, eight hundred and sixty thousand miles. In round numbers a million and a



THE TOTAL ECLIPSE OF THE SUN, JANUARY 1st.

Appearance of the Corona, as viewed from the Sierra Nevada Mountains.

W. M. P. 1889
GALLON ONE