

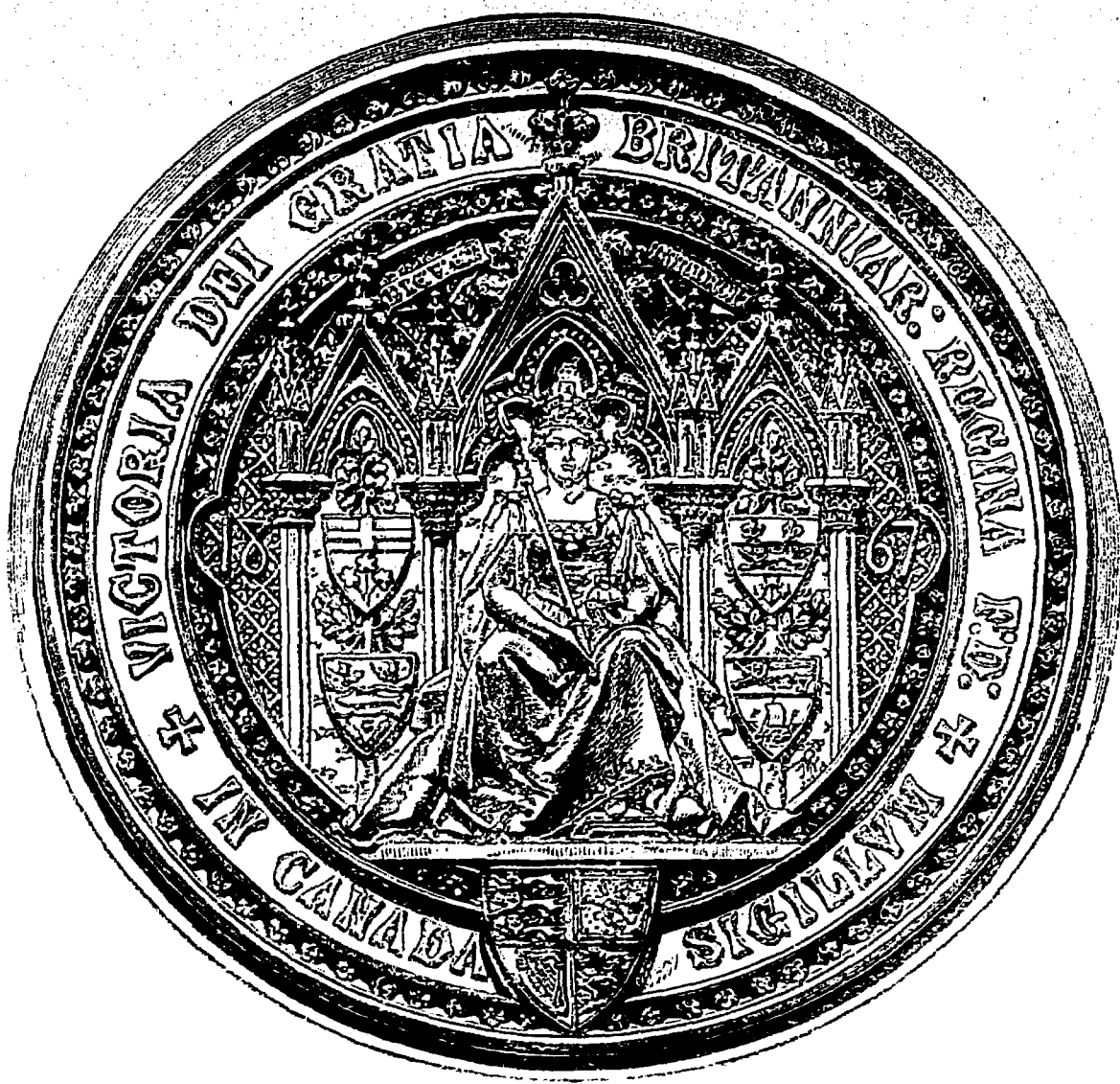
stroke of the A begins to raise itself from the sun's surface. Lastly, after yet another interval of four minutes, the figure of the prominence has lost all resemblance to an A, and may now be likened to a camel's head looking towards the right. The whole series of changes has occupied but twenty-three minutes, yet the flame exceeded our earth in volume ten-fold at the least. But Mr. Lockyer has recorded an instance of a yet more marvellous nature. A vast prominence extending seventy or eighty thousand miles from the sun's surface vanished altogether in ten minutes. The very way in which Zöllner's drawings were taken savors of the marvellous. We have spoken of them as colored. They are ruby-red, and so the prominences appeared to the astronomer. The real light of the prominences is not ruby-red, however, but rose-colored, with faint indications of pink, of even bluish tints. The fact is, that by the new method of observation the image of a prominence was formed by only a certain part of its light. We may say that out of the several colored images of the same prominence the astronomer selects one only for examination. The explanation of this is worth consideration, as it involves the essence of the method by which the prominences are seen at all. When we analyze light with a simple prism as Newton did, we get instead of a round spot of white—that is, mixed light—a row of overlapping spots of different color. It was only when, instead of a round spot, a fine line of white light was analyzed, that one could detect the absence of images of this line along certain parts of the rainbow-colored streak—in other words, it was thus only that the dark lines of the spectrum could be seen. And it was to see these lines more clearly that the slit of the spectroscopic was made so narrow and the rainbow-spectrum made so long by spectroscopists. But the observers of the prominences go back to the old method. If they use a narrow slit, a narrow strip of the prominence would alone form its spectrum, which would consist of a few bright lines. But by having a wide slit the whole prominence form its spectrum, which consists of a few bright pictures of the prominences. There is a green picture corresponding to the bright spectral line called F, a red picture corresponding to the bright spectral line called C, and so on. If the whole set of pictures were formed at once we could see none of them, for there would be side by side with them the blazing solar spectrum which would obliterate them altogether, just as in ordinary telescopic observation the bright sunlight blots out the prominences from view. But if the observer uses such a battery of prisms that the solar spectrum would be very long indeed, and if he admits to view only that part of the spectrum opposite which one of the prominence-images exists, he can then see that image quite distinctly, for the neighbouring part of the solar spectrum is so reduced in splendor that it no longer obliterates the prominence-figure. In this way, then, the observer selects one or other of the pictures of a prominence, either the red or the green picture to examine. And, strangely enough, it is by no means certain that the two pictures are alike. Rather it is highly probable that they are different, though we have not space here either to indicate reasons for believing this, or to explain the significance of the circumstance should it eventually be established.

"AH! YOU NAUGHTY BOY!"

You are now receiving one of your first experiences of how it feels to have a favourable response to the poet's prayer—

"Oh, wait some power the gift give us,
To see ourselves as others see us!"

And you don't like it! But though you are vexed with the picture, you feel half disposed to wipe away your tears and put a better face upon it. By all means do so. Thousands of glum visages and scowling brows might be made cheerful and bright if only some one would "hold the mirror up to nature's face," and show them the hideousness of discontent and ill-humour.



THE GREAT SEAL OF CANADA.

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The central Government of the New Dominion of Canada, being authorized to use a Great Seal, the same has recently been designed and executed by her Majesty's command, by Messrs. J. S. and A. B. Wyon, of Regent Street, London, England. The Seal, which is five inches in diameter, represents her Majesty the Queen seated under a rich Gothic canopy, crowned, wearing the robe and collar of the Garter, and holding a sceptre in the right hand, and the orb in the left. Underneath is a shield bearing the arms of the United Kingdom, and in minor compartments on each side are suspended on oak trees four shields, bearing the coats of arms recently granted to the four provinces respectively by her Majesty. The shield of Ontario bears a sprig of maple, and, on a chief, the cross of St. George. That of Quebec bears two fleurs-de-lis (indicative of French origin) and a sprig of maple, and, on a fess, a lion of England. The shield of Nova Scotia bears three thistles (indicative of Scotland), and, on a wavy fess, a salmon, symbolical of the salmon rivers which abound in that province. The shield of New Brunswick bears an antique ship, and on a chief, a lion of England. The inscription round the upper part of the seal is, "Victoria Dei Gratia Britanniar: Regina, F. D.," and underneath, "In Canada Sigillum." On the diaper background is the date of the Confederation, 1867. In working out the architectural details, Messrs. Wyon have availed themselves of the able assistance of Mr. T. H. Watson, of Nottingham place, an architect who, a few years since, carried off all the honours open to students in the Royal Academy, and in the Royal Institute of British Architects. The Great Seal is attached to all important documents executed by the Canadian Government in the name of the Queen, and, like the Great Seal of England, conveys the Royal authority to all documents to which it is attached. The four provinces of the Dominion have also separate seals, smaller in size, and different in design, for use by the local Governments of the respective provinces. These also have been executed by Messrs. Wyon.

THE AURORA AND THE ZODIACAL LIGHT.

Since the discovery that auroral lights are due to the action of the sun, setting electric forces in motion in the earth's atmosphere, these brilliant phenomena have been subjected to the analysis of the spectroscopic, in order to determine, if possible, the condition of that part of our atmosphere in which the electric action takes place. The result was a surprise to scientific men. Instead of a rainbow-colored streak of light, such as would have appeared if the aurora was due to the existence of particles excited to luminosity by electric action, a single line of coloured light appeared. This indicated that the light is due to the incandescence of some gas through which electric discharges in the upper air take place. The position of the line showed that the gas was one hitherto unknown. Had it been one which chemists are acquainted with, it would have occupied the position proper to that gas; but there is no known element whose spectrum has a bright line where this one appeared. Repeated analyses have failed to determine what this substance is to which the aurora owes its brilliancy. The same analytical process has been applied to the zodiacal light, the cause of which has ever been a fruitful source of speculation among astronomers, and it is found to be identical with the aurora. The spectrum discloses but a single line of light, the same as that seen in the spectrum of the aurora. The aurora and zodiacal light are due to the same medium.

These discoveries are believed to explain some of the characteristics of comets. It has been long thought that the peculiarities of comets' tails were due to electrical action, but astronomers were unwilling to adopt such a theory without some positive evidence in its favour. We now have such evidence, and it is probable that analysis will establish the opinion that comets' tails have something in common with the aurora and the zodiacal light.



"AH! YOU NAUGHTY BOY!"