

the chemical products have to be disposed of. In the case of gun cotton, it has been calculated that, if the sun were made of it so condensed as only to burn on the surface, it would burn out, at the rate of the sun's expenditure of light and heat, in eight thousand years. Anyhow—fire, kept up by fuel and air, is out of the question. There remain only three possible sources of them, so far as we can perceive—electricity, friction, and vital action. The first of these was suggested by the late Sir William Herschel in 1801; the second, at least as a possibility, though without indicating any mode by which the necessary friction could arise, by myself, in a work* published in 1833. The theory at present current of it is founded on what may not unfairly be considered a further development of this idea, the friction being supposed to arise from meteoric matter circulating round the sun, and gradually subsiding into it, and either tearing up its surface, or ploughing into its atmosphere. But on this we cannot dilate, as nothing has been hitherto said about the appearance of the sun in telescopes, and the strange phænomena its surface, so examined, exhibits.

(33.) One of the earliest applications of the telescope was to turn it on the sun. And the first fruits of this application (which originated about the same time in the year 1611, with Harriot in England, Galileo in Italy, and Fabricius and Scheiner in Germany), was the dis-

* "Lardner's Cabinet Cyclopædia," Astronomy, s. 337, p. 212. Aristotle was earlier in making this suggestion: but such random guesses as those of the ancients can hardly merit the name of scientific suggestions.