the type of perfection. The announcement that even he was not without stain, came like a thunderbolt upon the philosophers of those days. Yet the facts were undeniable; there were the spots black and ugly, some of them larger than the combined area of North and South America. Further study showed that each of these spots had a dark centre called the nucleus, bordered by a brighter ring termed the penumbra In their immediate vicinity are usually streaks more luminous than the surrounding surface, literally portions of the sun brighter than the sun itself. To these have been given the name faculae. The spots not only rotate with the sun, but also have indeand sometimes pendent retrograde motions of their own. They exist in the photosphere only and have been clearly proven to be depressions in this envelope; for when they reach the western limb of the sun and are passing out of sight they appear as pieces broken off the rim of his disc. By close observation of their motion the startling fact has been learnt that different parts of the sun rotate in different times, just as if, for instance the hub of a wheel were to rotate faster than the spokes. Hence the sun cannot possibly be made up of a solid mass. The spots occur, for the most part, only within a belt extending on either side of the sun's equator and are most numerous every eleventh year. Finally, the spectroscope proves that the constituents of the nucleus and penumbra are identical.

After the spots the photosphere itself, the envelope in which they appear, was naturally most studied. The spectroscope informs us that many of the terrestrial elements, iron, cobalt, etc., are also present in the light-bearing mantle of the sun in a gaseous condition, thus indicating intense heat. From this proceeds almost all the light and heat that gladdens and vivifies our sombre old earth. Next in order is the atmosphere which is very complex in character, being made up, as far as we know, of metallic vapours whose temperature is guite low, compared with that of the photosphere. Hydrogen is also present in this belt, but it is much more prevalent in the superlying one, the chromosphere, which, in fact, it mainly constitutes.

The remaining envelope, the corona, is the most mysterious of all and least is known concerning it, as it can only be studied during the few seconds of a total eclipse—the spectroscope being unable to give us any information concerning its composition. It is known, however, to be in part self-luminous but reflects some light from the sun. It must be composed of matter far more tenuous than our lightest gases, for comets pass through it without having their rate at all retarded, whereas it has been mathematically demonstrated that were it composed even of hydrogen, the lightest of earthy substances, their velocity would be sensibly decreased.

During total eclipses there have been seen stretching out from the sun's disc into this corona immense segments, usually red or orange in color, which look for all the world like tongues of flame shooting up from some monstrous conflagration. These have been known to attain a height of sixty thousand miles, nay, even more, and are said to form a spectacle the equal of which in sublimity is nowhere to be found in nature. They can, however, be seen only through the telescope.

These, then, are the principal facts that observation has made known concerning the vivifier of nature. Scientists differ regarding the conclusions to be drawn from them. Up to Father Secchi's time, the spots being the most noticeable phenomena, were made the bases of all theories explaining the sun's composition. But one of these is worthy of mention, however, as it is the only one other than that of Father Secchi, which is regarded with any favor in the scientific world. Mr. Faye is its author, and after the able exposition recently made in the columns of this journal of his theory regarding the formation of the world, readers will not be surprised to learn that, according to him, whirlwinds are the great agencies at work on the sun. He believes the spots due to their presence in the photosphere, the nucleus forming their vortex and the penumbra Their origin he attributes to their body. the different rate of rotation of different parts of the sun, a phenomenon already mentioned. Once formed, they suck down the cooled vapours floating in the sun's atmosphere into the interior again, where they are once more vapourized and by the me agency, returned to the surface which is thus kept from cooling down.

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