

give the most general features, sufficiently applicable to the details of the phenomena upon the surface of the Sun, science at present assumes the existence of three envelopes round the dark solar sphere; viz., one interior cloud-like *vaporous envelope*, next a *luminous investment* (photosphere), and above these, as appears to have been especially shown by the solar eclipse of the 8th of July, 1842, an *external cloudy envelope*, which is either dark or slightly luminous.*

As felicitous presentiments and sports of fancy—such subsequently realized speculations as abound in Grecian antiquity—sometimes contain the germ of correct views long prior to any actual observation, so we find in the writings of Cardinal Nicolaus de Cusa (in the second book *De docta Ignorantia*), which belong to the middle of the fifteenth century, the clearly expressed opinion that the body of the Sun itself is only “an *earth-like nucleus*, surrounded by a circle of light as by a delicate envelope; that in the center (between the dark nucleus and the luminous covering?) there is a mixture of water-charged clouds and clear air, similar to our atmos-

* “D’après l’état actuel de nos connaissances astronomiques le Soleil se compose, 1. d’un globe central à peu près obscur; 2. d’une immense couche de nuages qui est suspendue à une certaine distance de ce globe et l’enveloppe de toutes parts; 3. d’une *photosphère*; en d’autres termes, d’une sphère resplendissante qui enveloppe la couche nuageuse, comme celle-ci, à son tour, enveloppe le noyau obscur. L’éclipse totale du 8 Juillet, 1842, nous a mis sur la trace d’une troisième enveloppe, située au-dessus de la *photosphère* et formée de nuages obscurs ou faiblement lumineux. Ce sont les *nuages* de la troisième enveloppe solaire, situés en apparence, pendant l’éclipse totale, sur le contour de l’astre ou un peu en dehors, qui ont donné lieu à ces singulières proéminences rougeâtres qui en 1842 ont si vivement excité l’attention du monde savant.” “According to the present condition of our astronomical knowledge, the Sun is composed, 1st. of a central sphere which is nearly dark; 2d. of a vast stratum of clouds, suspended at a certain distance from the central body, which it surrounds on all sides; 3d. of a *photosphere*, or, in other words, a luminous sphere inclosing the cloudy stratum, which in its turn envelops the dark nucleus. The total eclipse of the 8th of July, 1842, afforded indications of a third envelope, situated above the *photosphere*, and formed of dark or faintly illumined clouds. These clouds of the third solar envelope, apparently situated during the total eclipse on the margin of the Sun, or even a little beyond it, gave rise to those singular, rose-colored protuberances, which so powerfully excited the attention of the scientific world in 1842.”—Arago, in the *Annuaire du Bureau des Longitudes pour l’an 1846*, p. 464, 471. Sir John Herschel, in his *Outlines of Astronomy*, p. 234, § 395 (edition of 1849), thus expresses himself: “Above the luminous surface of the Sun, and the region in which the spots reside, there are strong indications of the existence of a gaseous atmosphere, having a somewhat imperfect transparency.”