to metallic silver. The nitric acid and the organic compound are evidently thrown into some new conditions by the agency of the sun's rays, the examination of which I reserve for the present.

CHLORIDE OF SILVER.

21. Perfectly pure chloride of silver was prepared by dissolving crystalized nitrate of silver in distilled water which had been boiled with a little nitric acid, to ensure the absence of any organic matter; it was then precipitated by pure muriatic acid, well-washed with distilled water, separated by subsidence, and dried on glass in a sand bath. In diffused light this chloride changes color very slowly, and eventually assumes only a light lead color, In bright sunshine it darkens much more rapidly, and becomes brown by about one hour's exposure.

22. Under the influence of the prismatic spectrum, two very decided colors are produced on the pure chloride of silver—a blue or fine rich lead color, by the space between the most refrangible green, and the extreme edge of the violet rays, beyond which for some distance the same color is produced, but gradually lowered, until it becomes a mere tint of a lilac hue, at a distance beyond the visible spectrum, equal to about one-third its length. Now, supposing we divide the visible group of rays into 100 parts, this tinting goes on over a space equal in extent to thirty-four of such parts. Over the space covered by the ordinary and the extreme red rays, a very decided red impression is slowly made. By combining the influence of the red and the blue rays, the chloride with tolerable quickness becomes of a fine brown color. I find it would be quite practicable to arrange a scale of colors with which the actinized chloride of silver might be compared, and thus enable us to ascertain with tolerable correctness the relative quantities of heat and chemical power existing in the solar rays at any time. By means of an arrangement similar to that used by Mr. Shaw and Dr. Percy, by which the chloride is restored, after darkening, to its original condition by the action of chlorine, a very accurate and interesting series of observations might be made.*

23, As it appeared probable that artificial heat would produce similar effects to those described as the result of exposing chloride of silver to the thermic rays, many experiments were made with this view. In no instance, however, would artificial heat directly applied or reflected from a metallic surface produce any change in the color of the chloride of silver, short of the point at which it is converted into horn silver, and then the color is but very slightly altered; and even if the heat is incautiously allowed to become too great, it only passes into a lead color, this change arising from the reduction of some portions of the chloride to the metallic state. From this we may infer that the solar and terrestrial heat have properties distinct from each other, or perhaps that solar heat has of itself, in its ordinary state, no particular power in producing a change in the chemical condition of bodies, but that it modifies the action of actinic force, in a similar manner to which light has been shown to do so, (see the published experiments of Herschel,† Becquerel,‡ Draper and the author.§)

24. Mr. Fox Talbot, and, following him most other inquirers, have stated that in the preparation of the ordinary chloridated photographic papers, it was necessary, to ensure sensibility to solar action, that the chloride of silver should have some nitrate of silver in mixture with it. It was important to ascertain if possible the cause of this. Three pieces of glass covered with films of chloride of silver by subsidence, in the manner recommended by Sir John Her-

* Philosophical Magazine, vol. xxv. p. 450.

† Philosophical Transactions, 1841.

‡ *Annales de Chimie*, 1843.

§ Philosophical Magazine for 1840, 1842, 1843 1844, and 1845,