These experiments, then, prove that the transmission of light through the blood-vessels is not necessary for the production of the crimson flush, and that a long rest be given to the eye to perceive the phenomenon described by Professor Tait, and that the former depends upon the latter effect.

In the experiments last described the whole of the retina was affected. There is still one point that requires explanation. How is it that either a very powerful or a very feeble light is the most potent, either a gas flame or diffuse light that has passed through several folds of paper? At first this seems to militate against the identity of the two phenomena, but a little consideration explains difficulty. First, if the light be very bright, *e.g.*, a gas flame, the red will certainly have a greater tendency to appear, but it seems *a priori* likely that the other colours will also soon become apparent. Thus we should expect with a powerful flame to see a very intense redness, lasting a very short time. Second, if the light be very feeble, *e.g.*, diffuse light passing through paper. Here it is not likely that we should get so brilliant a red, but it is certainly very probable that it will be much longer before the other colours become sensible, since they are so feeble. We should expect then, in this case, to have a less powerful red lasting a longer time, but with the gas flame a strikingly brilliant flush, lasting a very short time. Again, with a medium light the green and blue colours would be added rapidly, and the crimson flush would not be powerful enough to be conspicuous in that short time. I may say that in every point this agrees exactly with the appearances as they are really seen.

4. A Theory of Volcanic Eruptions. By Daniel Vaughan.

From researches which have much engaged my attention for nearly twenty years, I am convinced that silica performs a very important part, not only in the formation of the earth's crust, but also in leading to violent subterranean movements. The low specific gravity of silicic acid, and of the rocks in which it predominates, would (if much of the internal earth were fluid) give rise to certain results, which I traced in an essay published in 1856, and also in a paper which was brought before the British Association for the Advancement of Science in 1861. In the latter, I have given

reasons for believing that the invisible side of the earth's crust is very irregular in its structure; and that, as pressure promotes solidification, the great internal mountains must constantly increase in depression in consequence of the deposition on their peaks of solid matter of low density, and consisting either wholly or largely of silicic acid. I ascribed earthquakes to the occasional instability of such masses of new rock, as their size and buoyancy causes them to break loose from their fastening, and an ascending stony avalanche is driven against the weaker parts of the earth's crust.

But, on taking into consideration the great affinity of silicic acid for bases at a high temperature, volcanic phenomena may be traced to the collision of these silicious avalanches against such sedimentary rocks as contain carbonic and many other acids. Carbonate of lime, for instance, would not be decomposed by heat under the pressure it feels at great depths; but if a stratum of limestone were struck by a mass of incandescent quartz, or of highly silicified rocks, the resulting fragmentary mass would swell with the evolution of carbonic acid, and give rise to the various peculiarities observed in the eruptions and the upheaval of volcanic mountains.

5. On the Placentation of the Sloths. By Professor Turner.

After referring to the paucity of information on the placental characters of the sloths, and to the various inferences which had been drawn by anatomists from Carus's figure of the placenta of *Bradypus tridactylus*, some holding that it was cotyledonary and non-deciduate, others that it might have intermingled with its maternal deciduous substance, the author proceeded to describe his dissection of the perfectly fresh gravid uterus of a specimen of a two-toed sloth. This specimen, which was presented to him by Dr David Ridpath, only possessed six cervical vertebræ, and was referred to the *Choloepus Hoffmanni* of Peters.

The author had succeeded in obtaining excellent injections both of the foetal and maternal systems of blood-vessels. The placenta consisted of about thirty discoid lobes, aggregated together, and occupied about $\frac{3}{4}$ ths of the surface of the ovum. These lobes could be peeled off the placental area of the uterus, and carried away with them a layer of deciduous serotina, the curling