A VAST DUST ENVELOPE.

S CIENTIFIC men have evinced extraordinary interest in the wonderfully brilliant sunsets that have for some time past been observed in different parts of the world. Various theories have been advanced, but all are agreed that the real cause is not yet definitely determined. At the Brevoort House yesterday, a *Tribune* reporter spent a couple of hours with Prof. S. P. Langley, astronomer at Alleghany Observatory, Alleghany, Penn. His views upon the topic of the transmissability of light through our atmosphere are stated below:

"At first I supposed the sunset matter a local phenomenon, but when the reports showed it to have been visibile all ovecr the world, it was obvious that we must look for some equally general cause. We know but two likely ones, and these have been already brought forward. One is the advent of an unusual amount of meteoric dust. While something over ten millions of meteorites are known to enter our atmosphere daily, which are dissipated in dust and vapour in the upper atmosphere, the total mass of these is small as compared with the bulk of the atmosphere itself, although abolutely large. It is difficult to state with precision what this amount is. But several lines of evidence leads us to think it is approximately not greately less than 100 tons per diem, nor greately more than 1,000 tons per diem. Taking the largest estimate as still below the truth, we must suppose an enormously greater accession than this to supply quantity sufficient to produce the phenomenon in question; and it is hardly possible to imagine such a meteoric inflow unaccompanied with visible phenomena in the form of ' shooting stars' which would make its advent visible to all. Admitting, then, the possibility of meteoric influence, we must consider it to be nevertheless extremely improbable.

"There is another cause, which I understand has been suggested by Mr. Lockyer-though I have not seen his article-which seems to be more acceptable-that of volcanic dust; and in relation to this presence of dust in the entire atmosphere of the planet, I can offer some little personal experience. In 1878 I was on the upper, slopes of Mount Etna, in the volcanic wastes, three or four hours' journey above the zone of fertile ground, I passed a portion of the winter at that elevation engaged in studying the transparency of the earth's atmosphere. I was much impressed by the fact that here, on a site where the air is supposed to be as clear as anywhere in the world, at this considerable altitude, and where we were surrounded by snow-fields and deserts of black lava, the telescope showed that the air was filled with minute dust particles, which evidently had no relation to the local surroundings, but apparently formed a portion of an envelope common to the whole earth. I was confirmed in this opinion by my recollection that Prof. Piazzi Smyth, on the peak of Teneriffe, in mid-ocean, saw these strata of dust rising to the height of over a mile, reaching out to the horizon in every direction, and so dense that they frequently hid a neighbouring island mountain, whose, peak rose above them, as though out of an upper sea. In 1881 I was on Mount Whitney, in Southern California. the highest peak in the United States, unless some of the Alaskan mountains can rival it. I had gone there with an expedition from the Alleghany Observatory, under the official direction of General Hazen, of the Signal Service, and had camped at an altitude of 12,000 feet, with a special object of studying analogous phenomena. On ascending the peak of Whitney, from an altitude of nearly 15,000 feet the eve looks to the east over one of the most barren regions in the world. Immediately at the foot of the mountain is the Invo Desert, and on the east a range of mountains parallel to the Sierra Nevada, but only about 10,000 feet in height. From the valley the atmosphere had appeared beautifully clear. But from this aerial height we looked down on what seemed a kind of level dust-ocean, invisible from below, but whose depth was six or seven thonsand feet, as the upper portion only of the opposite mountain range rose clearly out of it. The color of the light reflected to us from this. dust-ocean was clearly red, an it stretched as far as the eye could reach in every direction, although there was no special wind or local cause for it. It was like the dust seen in mid-ocean from the peak of Teneriffe-something present all the time, and a permanent ingredient in the earth's atmosphere.

"At our own great elevation the sky was of a remarkably deep violet, and it seemed at first as if no dust was present in this upper air, but in getting, just at noon, in the edge of the shadow of a range of cliffs which rose 1,200 feet above us, the sky immediately about the sun took on a whitish hue. On scrutinising this through the telescope it was found to be due to myriads of the minutest dust particles. I was here at a far greater height than the summit of Etna, with nothing around me except granite and snow-fields, and the presence of this dust in a comparatively calm air much impressed me. I mentioned it to Mr. Clarence King, then Director of the United States Geological Surveys, who was one of the first to ascend Mount Whitney, and he informed me that this upper dust was probably due to the 'loess' of China, having been borne across the Pacific and a quarter of the way around the world. We were at the summit of the continent, and the air which swept by us was unmingled with that of the lower regions of the earth's surface. Even at this altitude the dust was perpetually present in the air, and I became confirmed in the opinion that there is a permanent dust shell inclosing the whole planet to a height certainly of about three miles (where direct observation has followed it), and not improbably to a height even greater : for we have no reason to suppose that the dust carried up from the earth's surface stops at the height to which we have ascended. The meteorites, which are consumed at an averege height of twenty to forty miles, must add somewhat to this. Our observations with special apparatus on Mount Whitney went to show that the red rays are transmitted with greatest facility through our air and rendered it extremely probable that this has a very large share in the colours of a cloudless sky at sunset and sunrise, these colours depending largely upon the average size of the dust particles.