the grand step from the lifeless to the living protoplasm has not been diminished. Physiologists may perhaps hereafter discover and explain the difference between organic forms living and dead, but at present it is not proved that the phenomena of life can be reconciled with the mere functions of matter.

"On a new form of Calamitean Strobilus," by Professor WILLIAMSON, F.R.S. [This paper was afterwards read at an Ordinary Meeting of the Society, held October 19th, 1869. See page 7.]

Dr. HENRY SIMPSON exhibited specimens of *Statice spathulata*, gathered by himself this autumn on Hilbree Island, Cheshire. He remarked that the locality is the one given in Lyson's "Magna Britannia," but that the plant had not, he believed, been noticed there for many years.

Mr. TAIT sent a portion of the beach from near Alexandria, Egypt, consisting almost entirely of shells. He stated that for miles along the coast the shore was of a similar character.

Mr. JOSEPH SIDEBOTHAM read a paper on "Varieties in Lepidoptera."

The questions as to what constitutes a species? where does a species end, and a variety begin? and whether a species be a natural or merely an artificial division? are amongst the most difficult of solution in the whole range of natural history, and just at this time are very prominently before the scientific world.

With a view to determine the influence which difference of food and light might have in modifying species, the author gives the following as the result of some experiments which he had made.

I procured about 2,500 larvæ of the tiger moth, in a young state. I divided them into six lots, keeping each in

a separate cage, and feeding them differently. One lot was fed on willow, another on butter bur, (Petasites vulgaris,) another on hawthorn, another on plum, one on dock, and one on nettle, grass, bramble, and various other kinds of food. A considerable proportion of each became perfect insects, and I could detect no difference whatever in the colours, from the food they had lived upon. That is to say, the variations in colour and marking, were not to be traced in any case to the food. I kept several batches of eggs, and reared the larvæ carefully through the winter, and then again divided them, giving each lot a different kind of food. Again the same result. I found that one year the larvæ I had brought from the coast had usually the inferior wings more or less of a yellow shade, instead of the bright scarlet of the Cheshire specimens.

Having for many years continued these experiments without obtaining any marked results, I this year tried another of a different nature. I selected the tortoiseshell butterfly, as one of the least variable species we have, and I procured several broods of young larvæ just emerged from the egg. These I kept in a dark box until I had all ready, and then I divided each brood into three lots, putting one-third into a box in my photographic room which is lighted with orange colored glass, one-third into a box lighted with blue glass, and the ventilators carefully shaded so that only light of a blue colour could reach the larvæ, the remainder were put into an ordinary cage, in the natural light.

The latter fed up and came out into butterflies in the usual time.

Those in the blue light were not healthy, and though every care was taken, at least fifty or sixty died before changing, and a considerable number changed into chrysalides, and then died, those that came out into perfect insects were very much smaller than usual.

Those lighted by orange-coloured glass fed up very well, but many of the two first lots had come out before one of them changed into chrysalis; scarcely one of them died, and I examined each one before I allowed it to fly, to see

what effect had been produced. I retained a few specimens of each lot to exhibit this evening, and now proceed to describe the difference.

Those reared in the blue light differ from the ordinary form in being on an average much smaller; the orange brown is lighter in shade, and the yellow and orange run into each other, instead of being distinct and separate.

Those reared in the non-actinic, or yellow light, are also smaller, the orange brown is replaced by a salmon colour, the venation more strongly marked, and the blue dashes at the edge of the wings in the usual form, are in these of a dull slatey colour. A series of specimens of these side by side, with those reared in ordinary light, are here for exhibition.

One evening I found about 60 butterflies out of chrysalis, of those in the photographic room, and taking each one carefully I examined them all and allowed them to fly; shortly afterwards I found the whole of them had settled against the wall of the house, and presented a most remarkable appearance, they remained there more than half-an-hour, the western sun was shining against the wall, and it is not unlikely when being suddenly brought from the red light, where they had spent all their lives, to the bright daylight, they have been so dazzled as to act in this peculiar manner.

The results of this experiment do not show any very startling change in colour, such as one would have expected from the known effects of light on plants and from the occasional occurrence of very much more strange varieties, one now and then meets with, which cannot have been subject to such severe treatment; still, when we consider that even this difference is caused in one generation, and in the course of a month, it is a very suggestive fact, and leads one to think that light has certainly as much or more effect on the colours of Lepidoptera, than the difference of food, and might in a long series of generations lead to very material changes in both form and colour, and perhaps considerably modify our ideas of what constitutes a species.