

ate actions in the mandibles, just as contact of the lips with an external body sets up sucking in the infant. All these movements depend upon what we call instinct—that is to say, organic habits registered in the nervous system of the race. They have arisen by natural selection alone, because those insects which duly performed them survived, and those which did not duly perform them died out. After a considerable span of life spent in feeding and walking about in search of more food, the caterpillar one day found itself compelled by an inner monitor to alter its habits. Why, it knew not; but, just as a tired child sinks into a sleep, the gorged and full-fed caterpillar sank peacefully into a dormant state."

Of course all this may have been written in joke. The writer may possibly be laughing at evolutionists. The "inward monitor" of the "gorged and full-fed caterpillar" undoubtedly looks rather suspicious, but one hardly likes to hint at anything so serious. Evolutionists will, I dare say, repudiate such "evolution" as a mere travesty, but it is quite time that half-a-dozen evolutionists who agree on main points should clearly state their belief.

In conclusion, let me ask you as students of nature's processes, whether you have not seen enough to convince you that the revival of the assumption which has been abandoned and reintroduced many times during the last few centuries, that the lifeless is the sole origin of the living—that in fact the non-living and the living are one—is now unjustifiable, and cannot be reasonably entertained. This monstrous fallacy, though taught with the greatest confidence, is based on assumption, and is supported by arbitrarily selected facts, and by not a few misrepresentations and dogmatic assertions. Whenever any form of this false doctrine has been successfully forced into popularity, it has led to the adoption and propagation of the most grievous errors and grotesque conceits.

COMET OBSERVATIONS AT PRINCETON.

The weather has been so unfavorable at Princeton, that we have been unable to make any very satisfactory measures upon the spectrum of the comet. On Saturday evening the comet was visible fairly for an hour or so, before it descended into a bank of cloud. On Sunday evening it was beautifully seen for about half an hour, and then was obscured by a fog which still continues.

The spectrum of the nucleus is very bright. It is apparently continuous, though there may be a little special emphasis at the points where the usual carbon lines ought to appear. The spectrum of the coma and of the tail is precisely like that of most comets, showing three bands which coincide sensibly with those given by the flame of a Bunsen gas-burner, presumably due to a hydrocarbon of some sort.

On Saturday evening the nucleus looked much like a star-fish, having five projecting points formed by jets of light protruding from the central globe to a distance of from four to ten seconds of arc. These jets were not equal in length or brightness, and were not symmetrically disposed with reference to the axis of the comet's tail. Two of them were somewhat curved, they were all diffuse and blunt at the extremity, rather than pointed.

On Saturday, instead of jets, the nucleus had a nearly circular envelope surrounding it, sharply defined from the coma. Its diameter was perhaps 20", but the fog came on before any measures could be made. This disc of light, surrounding the nucleus, was not uniformly bright—it was more brilliant on the side next the Sun, and there was a curious dark opening in it of oval form,

some 20° one side of the axes of the tail. We were preparing to study the spectrum of this envelope critically, when we were cut off by the mist.

Although the Comet is now receding from both Sun and Earth, it is rising so much higher in the Northern Sky each night, that if the weather becomes favorable, it may yet be possible to get something more satisfactory; but just at present the rain is pouring and the prospect is rather dreary.

C. A. YOUNG.

PRINCETON, N. J., June 27, 1881.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. No notice is taken of anonymous communications.]

LOCUSTS AND SUN SPOTS.

To the Editor of "SCIENCE."

SIR: Perhaps you will permit me to explain one inapposite word occurring in my communication on the above subject.

When I stated that European migrants come north and east, I should rather have said *north and west*, the set of the migrations, as far as known, is on European areas north and west; and in this direction, butterflies, sphinx moths and locusts, whose point of departure has been traced to Southern Asia or Northern Africa, travel periodically; the occurrence being made known to us by their vanguard, so to speak, sweeping over the eastern shore of Great Britain. That this track is not voluntarily chosen by instinct, but rather due to a prevailing south-easterly direction of the winds, rests now-a-days on a great amount of experience.

A. H. SWINTON.

GUILDFORD, ENG., June, 1881.

THE BLUE COLOR OF THE SKY.

Prof. Cornu having established the fact that the atmosphere of the earth exercises an energetic absorption upon the ultra-violet rays of the spectrum, whose limit varies according to the statement of the atmosphere and the altitude of the sun. Prof. Hartley sought to attribute this limitation to the influence of ozone. His experiments have demonstrated.

1.—That the ozone is a normal constituent of the higher atmosphere, where it is more abundant than on the earth.

2.—That this quantity of atmospheric ozone suffices to limit the spectrum in the ultra-violet region, without considering the absorption caused by the great density of the oxygen and nitrogen.

3.—That the blue tint of the atmosphere is due to the presence of ozone.

In respect of this last point, Prof. Hartley remarks that, if the ozone exists in the high regions of the atmosphere, the light reflected by clouds at a great height has a blue appearance because it traverses a gas of this color. It is so likewise with the light illuminating the distant portions of a landscape. Experiments have shown that 25 milligrammes of ozone for every square centimeter of a layer of 80 kilogr. thick can produce this phenomenon.

WE learn that Prof. H. S. Prichett, Director of the Glasgow Observatory, has been appointed Professor of Mathematics in Washington University, St. Louis, Missouri.