A.) Boston Decr 3d 1840

Recapn. of Ordrs of insects, transformation &c &c.

We spoke in our last lecture of the seven orders, into wc. Linnæus divides all the Insects ever yet discovered, viz 1st. Coleoptera. 2d. Hemiptera. 3d. Lepidoptera 4th. Neuroptera. 5th. Hymenoptera. 6 Diptera, & 7th. Aptera.

We exhibited to you examples of every one of these ordrs, all of wc. have been found at Cambridge & its vicinity. We gave you but a slight view of these objects. To bestow a lecture on each order wd. by no means exhaust the subject. — We treated more fully the changes, or transformations wc. the insect undergoes, because we consider it a very curious part of Natl. history. — "The caterpillar, whose life is one continued succession of changes, often moults its skin before it attains its full growth. These are the more singular, because when it moults, it is not simply the skin that is changed for we find in the exuvice, or "cast off cloths" of the caterpillar, the skull, jaws, & all the exterior parts, both scaly & membranaceous, which compose its upper & under lip; its antennæ, palpi, and even those crustaceous pieces within the head, wc. serve as a fixed basis to a number of muscles. We also find in the exuvice the spiracula, the claws, & sheaths of the anterior legs, and in general the traces of all that is visible in the external figure of the caterpillar." (Donovan. Rees cyclop. Entomol.)

Altho the antients noticed this transformation, yet they appear to have had erroneous ideas of the process, wc. was never

clearly explained till abt. a century ago, by Malpighius in Italy, and by Swammerdam in Holland. They patiently detected these insects under every stage, state, change and appearance, & have demonstrated this wonderful metamorphosis to the conviction of any one who will take the pains to examine what they have advanced on this subject.

But Mynheer Lyonet of the Hague has surpassed them all. He has filled a 4to Vol on the single subject of the black caterpillar, that feeds on the willow. It is the most elaborate work, ever performed in Nat. history. This gentleman spent a great part of 20 years of his life in describing a Caterpillar. He held a lucrative office in the government of Holland, & was celebrated for this work & for one of the very finest collection of shells in Europe.

B.)

Boston Dec.r 3d 1810

On the conduct of Insects

There is a species of catterpillar, wc is very singular in its march. They set out from their nest at sun-set, & march in procession, under the conduct of a chief, whose motions they follow. The ranks are at first composed of one catterpiller, the next rank of two, the next of three; the next of four, & so on; & the hinder ranks encrease to 20, 30, 40 abreast. The chief, or leader has nothing in him that distinguishes him from the rest, but by being the first, so that he is only primus inter pares. He is not constantly the leader; because any other catterpillar may in his turn occupy the same place. They return to their nest in the same.

Reamur

It is well known that every swarm, or army of Bees, that issues from the hive has a Queen at their head. These are colonies wc go in search of an establishment, because the metropolis is overcharged with inhabitants.

The sight of a Bee-hive says Bonnet, has something in it of an air of grandeur. We are struck in a particular manner with the regularity & geometrical exactness of their structure, as we are at the sight of their magazines, wc are replenished with every thing necessary for the support of the Society during the winter.

But what chiefly attracts our attention is the Queen: Her size the gravity of her march, & above all the homage paid to her by the rest, are circumstances that excite our wonder. Our surprize is encreased, when we see the working-

Bees

bees intirely cease from their labour, & suffer themselves to perish, when deprived of their sovereign. By what secret engagement, by what law superior, to self preser-vation are the bees attached to their Queen, and to such a degree as absolutely to neglect the care of their own lives. They seem to know her importance, & that she alone is to be the mother of a future hive.

Some caterpillars are distinguished by the name of tyers, folders, & rollers, according as they manage the leaves they live in. The tyers join several leaves together with silk threads, in order to form them into one intire parcel, in the centre of w.c is the lodge of the little hermit.

The folders fold the leaves either in whole, or in part. But the Rollers are the most to be admired. They live in a kind of a roll of a leaf, whose dimensions, form, and position vary in different species. Some give it a cylin-drical figure; others the form of a cone. The leaf is always rolled spirally. Now here is an insect that has got no claws, is yet able to roll up a leaf like a cigarr — e. g. —

The Carpenter bee affords a very curious instance of surprizing workmanship & contrivance in its habitation, or winter quarters .. e. g,

There is another species of solitary bee w.c is called the Tapestry bee, from its lining its habitation, w.c it makes in the ground, with tapes-try. This is formed of the flowers of the wild-poppy, w.c it cuts out curiously & conveys to her nest. If the pieces are rumpled,

the

stretchs them, & then fixes them to her walls with wonderous art. If the pieces she has brought be too large, she clips them off, & carries the fragments out, just as a person does who is papering a room. After this is done she fills her habitation nearly half an inch thick with a kind of paste, proper to nourish her young when hatched. She then takes her tapestry & folds it over the paste & the eggs, wc are by this means enclosed in a bag of paste; - this done she fills up with earth the empty space that is above the bag. — There is another solitary bee wc does the same with rose leaves. —

There is another solitary bee called the Mason-bee wc constructs its habitation with earth & sand, wc is generally placed against a wall, & is abt 6, or 7 inches diameter. It is generally divided into 12, or 15 cells, seperated from each other by a stone wall. There are several other solitary bees, the construction of whose habitation is equally curious. There is, in all these says M. Bonnet, so much exactness, symmetry, uniformity, & skill, that we should not believe it to be the work of a Fly, if we did not know at what school, she learnt the art of constructing it.

Adam's microscope

There is a species of Ants called Termites, wc surpass, in their provident, & diligent labour the common ant, the bee, the wasp, or the Beaver. Their sagacity & art, & powers are so very extraordinary, that I dare not relate them, least some of you might suppose we were romancing.

This species of Ants is composed of three orders: The 1st consists of the la-borers

labourers; the 2d of soldiers, or fighting ants; & the 3d of nobility, or the aristocracy of the community, for they neither labour, nor toil nor fight. Their task is only to continue the race of ants: these last have wings

The Termes Bellicosus erect habitations in shape resembling Sugar loaves, of 10, & 12 feet perpendicular height from the surface of the ground. I refer you to the writings of Mr Smeathman, in the London Philosophical Transactions, for a particular account of these Pallaces in miniature. There you will find an account of the royal apartments, the antichambers, the nurseries, & surprizing galleries & turrets, that excite astonishment in the beholders. I fully believe all that is related of these insects, but you ought not to believe it, unless you saw all the evidence in print. I cannot ∴ resist mentioning the extraordinary encrease in the size of the the Queen Ant. She encreases her abdomen from 15, or to 2000 times the bulk of the rest of her body, & from 20, to 30 thousand times the bulk of a labouring ant. Her abdomen, wc at first was but about ¼ an inch long, now extends to that enormous degree that its segments are ¼ an inch distance from each other! Her majesty lays 60 eggs in a minute; or upwards of 80,000 in 24 hours! & these are immediately carried away by the working ants, & each egg deposited in a cell.

I avoid repeating any more particulars of this astonishing creature; only that they will travel strait forwards in armies of several miles in width. On their approach the natives quit their villages, wc these voracious creatures eat up. They will eat up a wooden house, & leave its form entire like a crust of paper. But I refer you to the Article Termes in the Encyclop. & to the Phil. Transactions, for a complete acct. of what appears almost too wonderful to relate.