

sembles in the style of sculpture *T. uniophora*, Gray. The form of the scales on the ribs at once distinguishes it, however; the shape of the shell, especially the outline of the hind slope, is also very different.

7. *CHITON INSCULPTUS*, A. Adams. *C. testa oblonga, valde elevata, valvis terminalibus cæterarumque areis lateralibus radiatim costatis, costis granatis, granis transversis, subconfertis, ad marginem obsoletis; umbonibus carinatis; valva terminali antice umbonata; areis centralibus longitudinaliter valde liratis; liris obsolete rugoso-granulatis. Coccineus, areis centralibus lineis nigro-fuscis duabus ornatis; ligamento luteo-fusco fuscoque articulado squamulato, squamulis lævis, nitidis, convexis.*

Hab. New Zealand, on dead shells, deep water (Mr. Strange).

A beautifully sculptured species of a red colour, with two dark parallel lines down the centre of the valves.

8. *CHITON MURICATUS*, A. Adams. *C. testa oblonga, in medio valde elevata, nigro-fusco alboque variegata, valvis terminalibus cæterarumque areis lateralibus radiatim costatis; costis granis elevatis acutis ornatis; valva terminali in medio umbonata; areis centralibus longitudinaliter valde liratis, umbonibus lævibus, elevatis, subproductis; ligamento squamulato; squamulis mucronatis, imbricatis, apicibus suberectis.*

Hab. Sydney, under stones, low water (Mr. Strange).

This species is remarkable for the somewhat triangular imbricate scales of the ligament ending in sharp pointed mucrones; the ligament is tessellated with pale fuscous and dark brown; the ribs on the lateral areas are four, muricated with sharp granules.

9. *CHITON VERSICOLOR*, A. Adams. *C. testa oblongo-ovali, elevatiuscula, rufo, albo, fuscoque varie picta; valvis obtusis, in medio longitudinaliter sulcosis, umbonibus acutis subrostratis, apicibus deflexis; valva terminali in medio umbonata; ligamento tenuiter granoso-coriaceo rufo-fusco, maculis albis quinque ornato.*

Hab. Sydney, under stones, low water (Mr. Strange).

A prettily variegated species, with the scales on the ligament minute, imbedded and not imbricate, and the entire upper surface of the valves delicately shagreened.

ROYAL SOCIETY.

March 2, 1854.—Professor Graham, V.P., in the Chair.

1. "On the Growth of Land Shells." By E. J. Lowe, Esq., F.G.S., F.R.A.S. &c.

Perhaps the following observations on the growth of land shells may contain sufficient information to prove interesting to the Royal Society. Before describing them, however, a few introductory remarks will be necessary. Every individual experimented upon has

been kept in confinement since the day it was hatched. Each species has been placed in a separate box (filled with soil to the depth of three inches), and care has been taken to feed the Mollusca every other day, the food chiefly consisting of the leaves of the lettuce and cabbage. In very dry weather the soil has been moistened with rain-water about once a week; in the box containing *Helix pomatia* small lumps of chalk have been mixed with the soil.

The species experimented upon were:—

<i>Helix aspersa</i>	<i>Zonites cellarius</i>
— <i>caperata</i>	— <i>lucidus</i>
— <i>hispida</i>	— <i>nitidulus</i>
— <i>nemoralis</i>	— <i>radiatulus</i>
— <i>pomatia</i>	<i>Bulimus obscurus</i>
— <i>rotundata</i>	<i>Clausilia nigricans</i>
— <i>virgata</i>	<i>Pupa umbilicata</i>

The facts arrived at are,—

1st. The shells of *Helicidæ* increase but little for a considerable period, never arriving at maturity before the animal has *once* become dormant.

2nd. Shells do not grow whilst the animal itself remains dormant.

3rd. The growth of shells is very rapid when it does take place.

4th. Most species bury themselves in the ground to increase the dimensions of their shells.

First Experiment with Helix pomatia.

A specimen of this species having deposited thirteen eggs which were hatched during the first week of August 1852, six of the young ones were deposited in a box (having a lace cover) placed in the shade. The young *Helices* were regularly fed every other day until the beginning of December, when they buried themselves in the soil for winter; up to this period they had gradually increased in dimensions to the size of *Helix hispida*. From December until April the soil was kept dry, the box being placed in the cellar. On the 1st of April they were replaced in the garden, the soil having previously been copiously watered. On the 3rd of April the young ones appeared on the surface, being *no larger* in size than they were in December, and although regularly fed up to the 20th of June they scarcely increased, not being perceptibly larger in size than they were in December. However, on the 20th of June five of them disappeared, having buried themselves (with the mouth of the shell *downwards*) in the soil; on the 30th of June they reappeared, having in ten days grown so rapidly as at this time to become equal in size to *Helix pisana*. They again buried themselves on the 15th of July and reappeared on the 1st of August, having again increased in size. From this date they did not apparently become any larger, and on the 2nd of November food was withheld for the winter, and at the present time (February 14th) they are in a dor-

mant state. Probably they will arrive at maturity by July or August next. The sixth specimen did not bury itself until the 15th of August.

Second Experiment with Helix aspersa.

A pair of *Helix aspersa* having been procured in the act of copulation on the 19th of May 1852, they were placed in confinement. Each individual deposited about 70 eggs, which began to hatch on the 20th of June: these young ones grew but little during the summer. They buried themselves in the soil on the 10th of October, coming again to the surface on the 5th of April, *not having grown during the winter*. In May they buried themselves (with their heads downwards as with *Helix pomatia*,—in winter they and other species buried themselves with the head upwards), appearing again in a week *double the size*; this process was carried on at about fortnightly intervals until July the 18th, when they were almost fully grown. It is worthy of remark that this species, as well as *Helix pomatia* and *Helix nemoralis*, and probably other of the *Helicæ*, form an operculum at the aperture, after which they retire considerably within the shell, and form a second (much thinner), behind which they rest during the winter.

It would be swelling this paper too much to describe all the observations in full; it will perhaps therefore be considered sufficient to remark that the process of growth *within the ground* takes place with *Helix nemoralis*, *Helix virgata*, *Helix caperata*, and *Helix hispida*. *Helix rotundata* burrows into decayed wood to increase the size of its shell. *Zonites radiatulus* appears to remain on decaying blades of grass; whilst *Pupa umbilicata*, *Clausilia nigricans* and *Bulimus obscurus* bury their heads only to increase their shells. With respect to *Zonites cellarius*, *Zonites lucidus*, and *Zonites nitidulus*, it was not satisfactorily ascertained whether their heads were buried during the process of growth.

Observatory, Beeston, E. J. LOWE.
1854, February 14th.

BOTANICAL SOCIETY OF EDINBURGH.

April 13, 1854.—Professor Balfour, President, in the Chair.

Professor Balfour stated that Mr. Croall of Montrose, in an account of a trip to Clova, published in Hooker's Kew Miscellany, had remarked—" *Polypodium alpestre* at the head of the glen grows side by side with *Lastrea dilatata*, but I nowhere observed *Athyrium filix-fœmina* associated with, or at the same elevation as, *Polypodium alpestre*." This statement was not in accordance with what was observed by Dr. Balfour and his party during their trip to Clova at the beginning of August last. They found *Athyrium filix-fœmina* and *Polypodium alpestre* growing together both in Glen Fiadh and in Glen Dole. In many instances, it was necessary to look at the



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