MISCELLANEOUS INTELLIGENCE.

GEOLOGY.

Fossil Human Bones, 1.—M. de Christol, Secretary of the Natural History Society of Montpellier, in a communication to M. Cordier, relating to two newly-discovered caves containing bones, in the department of the Garde, observes, that after examining them with the greatest care, as well as the specimens obtained by digging, he is convinced that they present the proof of an incontestible mixture of human bones, with bones of mammifera belonging to extinct species. The remains of animals mixed with those of the human species, belong, according to the author, to the hyæna, the badger, the bear, the stag, the aurochs, the ox, the horse, the wild boar, and the rhinoceros. Some of the bones bear evident marks of the teeth of hyænas. Excrement of these animals are also found in the caves.—*Edinburgh New Philosophical Journal, October,* 1829.

Fossil Bones in Brabant.—Mr. Charles Morrens has just published a pamphlet, entitled *Revue Systématique des Nouvelles Découvertes d'Ossemens Fossiles faites dans le Brabant Méridional*, with lithographic plates. This pamphlet contains facts and observations highly interesting to the history of geology. The researches and discoveries made by the author, prove that there formerly existed in this country not only animals like those of the equinoctial regions, but also other species such as still exist near the pole. The fossil bones discovered in several places belong to animals of the following species: the badger, the elephant, hippopotamus, the whale, sparrows, water-fowl, reptiles of various kinds, tortoises, lizards, toads, and various fishes. The quarries of St. Gilles, Milsbrock, Suventhem, Woluwe, and in the environs of Brussels, have furnished the greater part of those bones, which appear to be antediluvian. (*Bull. Univ.*)

Diluvian Deposits.—Along the Erie canal, from Little Fall, a diluvian basin extends for 160 miles, having, it should appear, been filled with three preceding deposits; the last having been dismantled by torrents coming from Little Fall, and running towards the west, and the valleys thence formed have been filled with gravel, sand, clay, trees, fresh-water shells, &c. This diluvium is about 108 feet in thickness. The wood, which is Canadian pine, is buried at a great depth. The chief shells are Hélices, Uniònes, and Limnèæ. All the plains, elevated and crowned with virgin forests, exhibit, under the vegetable stratum, a bed of fine earth. The antediluvian animal remains are scanty, and consist of Paehydérmata. (*Siliman's Journal,* vol. xii. p. 117.)

Footsteps before the Flood.—Distinct impression of the feet of four different species of animals, have been discovered by Mr. Grierson, in a red sandstone quarry, about two miles to the north of the town of Lochmaben, in the county of Dumfries. Professor Buckland, upon receiving casts thereof, and a fragment of the sandstone, expressed his opinion, that the rock, while in a soft state, had been traversed by living quadrupeds. "The great number of impressions in uninterrupted continuity, the regular alternations of the right and left footsteps, their equi-distance from each other, the outward direction of the toes, the grazing of the foot along the surface before it was firmly planted, the deeper impression made by the toe than by the heel, and, in one instance, the sharp and well defined marks of the three claws of the animal's foot, are—circumstances which immediately arrest the attention of the observer, and force him to acknowledge that they admit of only one explanation. The impressions of one of these tracts, Dr. Buckland thinks, has been produced by the feet of a tortoise or a crocodile. One of the deepest and most distinct impressions, was found at the base of the stratum, in the lower part of the quarry, perhaps sixty or seventy feet beneath the surface of the earth."

British Fossil Shells.—The following series of fossil shells are known to English naturalists:—

Simple univalves	58	genera, which comprise	401 species.
Simple bivalves	62		583
Complicated bivalves	3		51
Multilocular bivalves	12		230
	135		1265

On making three principal divisions of the formations containing organic remains, and enumerating the shells they respectively contain, we have these results:

The *first*, which is also the lowest or most ancient division, may be subdivided into two series of formations.

1. Carboniferous order of Mr. Conybeare.		2. From the carboniferous to thé lias, inclusive.
Species 27	Simple univalves - - - -	9 species.
34	Simple bivalves - - - -	33
46	Complicated bivalves - -	5
33	Multilocular univalves - -	50
140		97

The *second*, or middle division, from the lias upwards, includes the entire oolite series, and the strata up to the chalk, inclusive.

Simple univalves	106 species.
Simple bivalves	375
Complicated bivalves	0
Multilocular univalves	139
	620

The *third*, or most recent, division, comprises all the beds above the chalk, or the tertiary formations.

Simple univalves	259 species.
Simple bivalves	141
Complicated bivalves	0
Multilocular univalves	8
	408

The numbers of each of the four classes of shells which existed during seperate periods or geological intervals, are as follows:

First Division. Ancient strata, including lias.		Second and Third Divisions. Remaining strata, above the lias, up to diluvium.
Species 36	Simple univalves - - - -	365 species.
67	Simple bivalves - - - -	516
134 { 51	Complicated bivalves - -	0 } 147
134 { 83	Multilocular univalves - -	147 } 147
237		1028

Mr. Taylor next illustrates from the Tables, Mr. Dillwyn's remarks on the distribution of carnivorous and herbivorous Trachelipodes. He shows that, in the English formations, the *Zoophages* comprise 22 genera, and 171 species. They may be considered as appertaining to, if not as wholly characteristic of the tertiary formations; and many of the genera are continued in our present seas. Of the *Phylliphages*, 22 genera and 168 species are distributed through the secondary and tertiary formations.

When the members of each of these classes are arranged according to the three geological divisions already mentioned, we find that the turbinated univalves of the older strata or rocks belong almost entirely to the herbivorous family, 12 genera having originated there, which have been perpetuated through all the successive strata, and still inhabit our waters; that in the middle series of formations, this preponderance of animals possessing similar habits was preserved; and that, in the last series, after the chalk was deposited, this order was suddenly reversed, in the proportion of 5 to 19.

Mr. Dillwyn observed that all the marine Trachelipodes, of the herbivorous tribes, in the ancient strata, are furnished with an operculum, seemingly intended as a protection against the Cephalopodes, or carnivorous order of Nautili, Ammonites, &c., which, at that time, abounded in the seas. After the epoch of the extinction of this order (which terminated chiefly with the chalk), numerous unoperculated genera appear, as if no

longer requiring such a shield to protect them from an extinct enemy. As carnivorous turbinated univalves were almost entirely absent from the strata which contained the Ammonites, the Nautilidiæ, and the Belemnites, so the extinction of these immensely numerous tribes, being also carnivorous, or predaceous, was counterbalanced by the creation of a multitude of new genera, possessed of similar appetences.

Recurring again to our table for illustration of these positions, we observe that only 3 genera and 18 species of carnivorous turbinated univalves were coeval with the Cephalopodes, comprising 200 species, in the secondary formations; but that the same strata contained 17 genera and 87 species of Phylliphages.

When the Cephalopodes ceased with the chalk, at the same time with the numerous families of fossil Echinidiæ, the Trigoniæ, and nearly all the Terrabratulæ, they were replaced by 19 genera and 153 new species of Zoophages.

On comparing the existing classes of shells with corresponding series in the antediluvian creation, we have the following numbers:

	Simple Univalves.	Bivalves and Multivalves.	Multilocular Univalves.	Total.
Testaceous Mollusca of the present world, ascertained from the *Index Testaceologicus* of Mr. Wood, last edition - - - - - -	Species. 1961	Species. 874	Species. 58	Species. 2893
Specis of British fossil shells, heretofore described, dispersed throughout the entire range of the formations - - - - - - - -	401	634	230	1265

The conclusion to be drawn from a summary of facts more numerous, and on a more extensive scale than, until recently, has been attainable in this department of natural history, is, that in proportion as we descend the vast series of deposits that overspread this portion of the earth, so do we recede, step by step, from the circle of existing organized beings, and from the phænomena attendant on their structure, their habits, and their adaptations.

Fossil vegetables.—The plants characteristic of the secondary and tertiary formations, as given by M. A. Brongniart (Prodrome de l'histoire des végétaux fossiles), are as follows:—

In the Coal measures (Terrain Houiller) Calamites.—Ferns of the genera Sphenopteris, Neuropteris, Pecopteris, and Odontopteris: the species very numerous. Lycopodites et Lepidodendron. Sphenophyllum, Annularia, and Asterophyllites. The four last genera are only found in these formations.

In the Black Chalk and Bituminous Schist (Zechstein et Schistes Bitumineux).—Algæ analagous to the Caulerpa, particularly Fucoides selaginoides.

In the ——— (*Gre's Bizarre.*)—Calamites.—Ferns of the genera Sphenopteris, Neuropteris, and Anomopteris. Corniferæ of the genus Voltzia, and many monocotyledonous, phanerogamous plants.

In the Muscle Lime, (Muschelkalk.)—Neuropteris Gaillardati.—Mantellia cylindrica.

In the Kuiper and Lias (Marnes irisees).—Ferns of the genus Clathropteris, Teniopteris. Cycadeæ of the genera Pterophyllum, Nilsonia, and Zamites; particularly Pterophyllum longifolium and Zamites Bechii and Bucklandii.

In the inferior Oolite.—(Oolite inferieure.)—Equisetum columnare.—Ferns of the genera Pachypteris, Sphenopteris, Pecopteris, and Teniopteris, Cycadæ of the genus Zamia (9 species).

In the Forest Marble.—Fucoides. Rare ferns. Sphenopteris, Hymenophilloides. Zamia pectinata. Confervæ of the genera Thuytes and Taxites podocarpoides.

In the ——————— (Calcaire de Portland). Mantellia nidiformis.

In the Hastings Sand.—Lonchopteris Mantelli. (Pecopteris reticulata.) Sphenopteris Mantelli.- Clathraria Lyellii.

In the Green Sand.—Many species of Fucoides. F. Targionii, strictus, et Brardii. Zosterites. Cycadites Nilsonii.

In the Chalk. (Craie.)—Nothing determinable in regard to terrestrial plants. Confervites, fucoides rares.

In the Plastic Argil, Red Sand Stone, and Lignites. (Argill Plastique Milasse et Legnites.)—Palmæ, probably of the geneus Cocos, &c. Coniferæ of the genera Pinus, Thuya, Taxus, &c. Amentaceæ, Acerineæ, Juglandeæ, and other dicotyledontreis arborescent.

In the Coarse Lime Stone, (Calcaire Grossier.) Palmæ (rare). Coniferæ (rare). Pinus Defranchii, Dicotyledonous leaves very frequently. Numerous fucoides at Mount Bolca.

In the ———————————————— (Terrain d'eau Douce, Gypseux ou Paleotherien.) Chara Lemani. Palmæ. Flabellaria Lamanonis. Coniferæ. Pinus pseudo-strobus. Taxites Tournalii, &c. Amentaceæ, Carpinus; Betula and other dicotyledons.

In the superior sea formations. (Terrain marin superieur.) Pinus Cortesii; rare and little known plants.

In the superior fresh water formation. (Terrain d'eau Douce superieur.) Chara medicaginula. Nymphea.

Australia.—"The Society has received from the Admiralty, in the course of the present session, a small collection of specimens, from the site of the intended settlement in the vicinity of Swan River, on the west coast of Australia; and Captain Stirling, before his departure from England, in the capacity of its governor, was good enough to place in my hands some brief notes relating to them, which I shall take an early opportunity of laying before the Society From the zeal expressed by that distinguished officer, we may regard this contribution as an earnest of what may be expected hereafter from the colony under his superintendence: and having already received from the eastern shores of Australia enough to prove the resemblance of the rocks to ours, and even to point out the relative position and structure of the formations on some points of the coast, we may with reason expect the solution of some of the great questions respecting that region, which still are undetermined. It is remarkable, for example, that no traces have yet been descried of any active volcano along the whole circuit of those shores; although the latitudes nearer to the equator, and under nearly the same meridians, are the scenes of some of the most tremendous volcanic phenomina on record. The mode in which the waters condensed upon the vast continent of Australia are disposed of,—whether by evaporation from inland seas or lakes, or conducted to the ocean by rivers, whose existence has hitherto escaped detection, is another great question connected in all probability with its geological structure. But there is no subject of greater interest to us, at present, than the fossil organised remains of that country; a knowledge of which, especially the remains of animals, will be an addition of capital importance to our subject, and probably not less valuable to the zoologist. The diluvium, therefore, respecting which we have at present no information whatever, is deserving of the greatest attention; and since the existing races of Australian animals are so widely different from those of every other portion of the earth, the identity, on the one hand, of these animals with those occurring in a fossil state, would lead to some of the most important inferences; while, on the other, the agreement of the fossil remains of Australia with the existing races of other regions, now disjoined from that country, would give new support to some of the most popular speculations of our day. With a view to these enquiries, scarcely any thing that can be collected by our fellow-labourers in that quarter, will be without interest to their friends in Europe.—*Speech of the President of the Geological Society of London.*

ZOOLOGY.

Natives of Australia.—The native Australians have certainly but slender claims to what we are accustomed to term personal beauty. The head is large, out of proportion to the size of the body, and the disproportion is farther increased by the quantity of frizzled hair with which it is covered, and the volume of which is increased by an addition of grease and ochre. The

heads are flattened on the crown; their noses are flat, and the nostrils widely distended; they have hollow eyes, to which a deeper enforcement is given by great bushy projecting eye-brows, which also add to the wildness of their expression. Their mouths are uncommonly large; and, owing both to the prominence of the jaws and the thickness of the lips, there is an apparent elongation in that part, which, taken in conjunction with the flatness of the nose between the eyes, gives them a slight cast of the ourang-outang. Their bodies are, in those that are well fed and indolent, sometimes unshapely with fat; but from the quality of their food, and the difficulty they have of procuring a sufficient supply of it, that is but seldom the case. Their limbs are in every part disproportionably thin, although, from the exertion they are obliged to make, they are well knit and muscular, and capable of undergoing a great deal of fatigue. When born they are not altogether black, but of a reddish brown; and it is probable that, were they clothed, better fed, and not so much exposed to the action of the sun and atmosphere, or so bedaubed with grease, charcoal, and soot, they might be a dark brown, rather than a black people. In the form of their bodies, or the general expression of their countenances, there is hardly any difference throughout the whole extent of the country, farther than what might be expected from a great or a small supply of food, and different exertion of person. In the appearance of their hair there are more differences; those in Van Diemen's Land having it so much more frizzled than those of Sydney, as, upon superficial observation, to make them appear a different race. In other respects, however, they are so analogous as to establish the fact of their being the same.—*Picture of Australia.*

Insufflation of Animals.—M. Leroy discovered that atmospheric air, strongly impelled into the trachea (wind-pipe) of certain animals, such as rabbits, goats, sheep, foxes, &c. causes sudden death. Other animals, dogs, for example, in which the pulmonary, tissue is less delicate, resist this operation, but are more or less incommoded by it. Goats and sheep died under the eyes of persons appointed by the Academy to report upon the discovery, after air had been impelled into their lungs without the aid of a machine, but merely by the mouth of the experimenter. It would appear, that, most commonly the air blown in, lacerates the delicate tissue of the lungs at the upper part. Insufflation being recommended as an efficacious means of restoring drowned persons to life, it is of the greatest importance to know if human lungs are similar to the sheep and goat in this respect, or if they are possessed of a power equal to that of the dog. If the former be the case, insufflation would prove mortal to suffocated persons. Direct experiments are wanting on this subject; but trials made on the dead body, shew that the human lungs may be ruptured by insufflation. The lungs of very young children, on the contrary, resist the action of a very strong insufflation.—*Ann. de Chim. et de Phys.*

Breed of Cattle.—The cattle of Zanzibar are not of the Madagascar, but of the Bombay breed, small in size, weighing not more, on the average, than 200 lbs., and without the hump on the back, which generally distinguishes the horned cattle in this quarter of the world.—*Lit. Gaz.* No. 449, p. 555.

Lion.—A lioness recently whelped, in a menagerie at Utrecht, three male cubs, and one female, which she suckles herself.—*Lit. Gaz.* No. 449, p. 559.

BOTANY.

Genus. Aloe.—*Perigonium*, (flower,) pendulous, regular, cylindrical, *stamen* and anther's included. *Capsule* slightly ribbed. Shrubs or herbs, succulent, but mostly caulescent; flowers produced on lofty peduncles.—Alöe Linnæus, *Aiton*, *Haworth*, &c.

Aloe pluridens.—(Many-toothed Tree Alöe), leaves crowning the stem, sword-shaped, recurved, vigorous, teeth on the margins very numerous, strong, incurved. -Alöe pluridens.—*Haworth in Philosophical Magazine*, Oct. 1825.

Observ.—The stem of this species rises to the height of 8 to 10 feet, and is strongly formed. The leaves are disposed in a spiral or screw form, gracefully pendant: flower stems generally two, branching into three or more spikes; flowers of a brilliant scarlet colour, displaying themselves in June.

July, and August. *Inhabits a range of hills East of Boschjesmans River, where it was first discovered by Mr.* BOWIE.*

Duval. Plantæ Succulentæ. in Horto Alençonio. A. D. 1809. p. 6.

ALOE gracilis.—(Soft distant sword-leaved Alöe), leaves sheathing the stem, placed at a distance from each other, incurved, narrowing towards the point and bending downwards, sea-green, smooth, margins set with small remote teeth.—Alöe gracilis. *Haworth in Phil. Mag.* Oct. 1825.

This species, with slender stems about 5 feet high, was found on the hills near Camtoos River, and also near the stone quarries of Uitenhage, growing among the rigid and more woody productions of a Karoo soil.

ALOE albispina.—(White-spined Mitre Alöe), caulescent, leaves ovate-acuminated dark green: margins set with white spines which become yellow by age, and turn black on decay.—Alöe albispina. *Haworth in Linn. S. Transactions.* 8. 22.

Observ.—*This species of Alöe may be considered as the only one found indigenous in the Cape District. Inhabits Blaauwberg and Koeberg.*

GENUS, GASTERIA.—*Calyx*, (flower,) petal-like, reversely club-shaped, curved; stamens inserted at the base. *Capsule* slightly ribbed. Plants partially caulescent; leaves fleshy as in Alöe. *Flowers* pendulous.

GASTERIA pulchra.—(Marbled narrow shrubby Gasteria,) leaves acutely sword-shaped: peduncles of the flower lengthened, thin or slender.—Gasteria pulchra. *Synopsis Plantarum Succulentarum*, p. 86.—Alöe maculata. var. pulchra. *Aiton's Hortus Kewensis.* Edition 1 and 2.—Gasteria pulchra. *Haworth in Phil. Mag.* Nov. 1827.

Inhabits the thickets of the hills near the Coega River in Uitenhage District.

GASTERIA maculata.—(Short, marbled, shrubby Gasteria). General form of the plant, the same as the preceding species.—Gasteria maculata. *Synopsis Plant. Succ.* 85.—Alöe maculata. var. obliqua. *Hort. Kew.* ed. 1 and 2.—Alöe lingua. *Botanical Magazine*, 979.

Observ.—Leaves shorter than in the preceding species, but broader, wavedly-oblique, blunt; flowers, also much thicker. *Inhabit the hills near Uitenhage.*

GASTERIA picta.—(Marbled, shrubby Gasteria,) leaves sword-shaped, plain, blunted, with a mucrome; peduncle shorter than the flower. *Haw. in Phil. Mag. Nov.* 1827.

Observ.—The *stem* of this is shorter, the leaves twice the length of those of the preceding species, plainer and less keeled, marked with dull white spots; flower stem simple.

A new species discovered on the Coast between Plettenberg and Algoa Bays, by Mr. BOWIE.

GASTERIA formosa.—(Beautiful marbled Gasteria,) leaves tongue-shaped, smooth, entire, obtuse, with an acute point, marked with black and white bands.

A new species, inhabits the hills of Sunday River towards the coast.

GASTERIA fasciata.—(Short, bifarious, marbled Gasteria,) leaves disposed in two rows, short, thick, convex on each surface, blunt, entire; neatly marked with whitish spots.—Gasteria fasciata. *Haworth in Phil. Mag.* Nov. 1827.

Inhabits the thickets on the hills bordering the Graaff-Reinet and Uitenhage Districts.

Seeds of Plants.—One plant of the white poppy (that from which opium is obtained) has been estimated to yield 32,000 seeds; a single plant of tobacco 360,000; a single stalk or ear of reed-mace, 40,676; while the spleenwort, a species of fern (a family which was long believed to be without seed), has been estimated to produce no fewer than 1,000,000 on one stalk or frond.—*Quarterly Journal of Agriculture*, vol i. p. 8.

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* The habitats of the plants have been furnished by Mr. BOWIE.

GEOGRAPHY.

Geography.—In Jan. 1828, the Geographical Society of Paris had existed little more than six years. In the course of that short period it had established prizes to the amount of 16,400 francs; published a series of questions with reference to the principal *desiderata* in the science; caused several maps to be engraved; given the most complete text extant of the Travels of Marco-Polo; prepared instructions for a great number of travellers; obtained for them the countenance of the French and foreign governments; pointed out Cyrenaica as one of the most useful objects of inquiry; rewarded the admirable travels of M. Pacho, and M. Beaugnière's remarkable memoir on the hydrography of Europe; published two volumes of memoirs and manuscript narratives; received an immense variety of communications from all parts of the globe; maintained a scientific correspondence with the principal academies and learned societies in the two worlds; formed a valuable library; conceived the idea of a new hydrographical map of France, and concurred in its production by a committee from its own body; and, finally, offered a reward of eight thousand francs to the traveller who may be so fortunate as to penetrate into central Africa, either by the French possessions in Senegambia, or by the countries in the vicinity of the region of the upper Nile.

The members of the Society were then 348 in number. Twenty-two travellers were then pursuing their inquiries, under the auspices of the Society, in Peru, Colombia, Chili, Persia, India, Thibet, Arabia, Georgia, Numidia, Abyssinia, Senegal, &c., not to mention the Antilles, and a voyage round the world. It had recently been proposed to the Society by its President, to offer two annual medals for the most important geographical discoveries of the year; to receive communications on the subject written in either English, Spanish, or Latin; to accelerate the publication of a volume of memoirs and questions; and to address a circular letter to all the travellers, consuls, and correspondents of the Society. [*An example of diligence and activity.—Ed. Lit. Gaz.*]

RURAL ECONOMY, GARDENING, &c.

On the Introduction of Turnips into Britain.—Until the beginning of the eighteenth century, this valuable root was cultivated among us only in gardens or other small spots for culinary purposes; but Lord Townshend, attending King George the First in one of his excursions to Germany, in the quality of Secretary of State, observed the turnips cultivated in open and extensive fields, as fodder for cattle, and spreading fertility over lands naturally barren; and, on his return to England, he brought over with him some of the seed, and strongly recommended the practice which he had witnessed to the adoption of his own tenants, who occupied a soil similar to that of Hanover. The experiment succeeded; the cultivation of field-turnips gradually spread over the whole county of Norfolk; and, in the course of time, it has made its way into every other district of England.—*Quarterly Review.*

Method to preserve young Turnips from the Fly.—When two kinds of turnips are sown in the same field, those which are the most tender and succulent will chiefly suffer from the fly. A like distinction will be observed, if only one kind be sown, but the seed unequally scattered. Those plants that rise in clusters, protect one another from the sun and air, and offer a more agreeable food to the fly than those which come up at greater respective distances. Reasoning from these well known facts, Mr. Poppy, (to whom the Society, whose transactions are afterwards referred to, voted the Ceres Gold Medal for the discovery), was induced to drill four acres on his own farm, employing one pint of Swedish turnip seed per acre for those rows intended to stand for a crop, and half a peck of common turnip seed on the rows alternating with the former, and intended to attract the fly from them. The result was, that the thin sown Swedish turnips were not sensibly injured by the fly, while the thick sown ones were quite black with swarms of this insect. After the Swedish turnips had got into the rough leaf, the danger from the fly being over, the rows of common turnips were ploughed up, and the crop being afterwards managed in the usual way, turned out

very good, whilst all the other turnips in the parish sown at the same time, in the usual manner totally failed. Another experiment was made in the neighbourhood of Blandford, in Dorsetshire, the result of which was, the only good crop of turnips obtained during the last year in that part of the country.—*Trans. Soc. for Arts, Lond.* vol. xlv.

Preserving the Seed of Turnips.—The varieties of the turnip kind may be multiplied and improved by a careful selection. The manner of securing a good variety of seed, is to pick out from the field, in spring, the largest and best shaped turnips, with the smallest tops and tails, and to plant them in some separate place, in rows. When the plants flower, they must be well guarded from the depredations of birds: and, just before they are fully ripe, the stems must be cut down and well dried, and then either stored in stacks, to be thrashed out when wanted, or thrashed at once, and the seed preserved in the granary. Those who raise seed for sale generally sow the transplanted seed once more, in broadcast, and dispose of the produce of that which has been thus sown.—*Quarterly Journal of Agriculture.*

On the Insect which attacks the Ear of Wheat.—On inspecting many fields of wheat when the ear had left the *hose*, almost every ear was observed to contain a number of flowers, which were mis-shaped and discoloured. Within the husks of a sound flower, the parts of fructification were found, that is, the three anthers, supported on their filaments, and filled with pollen, and the ovary or young grain with its two hairy styles. But, on inspecting one of the discoloured flowers, these parts were found to be mutilated to a greater or less extent, and a number of little yellow worms were observed lying in the concave of the inner husks, and clinging about the anthers. These little maggots were of a bright lemon colour, and varied in size, according to their age, from being almost invisible, to nearly the fifth of an inch in length. They could not walk like caterpillars; but, when laid upon paper, they shewed good power of changing their place, by giving a spring into the air, and alighting several inches from the place which they left. That these animals were the cause of the disease in the wheat there can be no doubt. Let us, then, inquire a little into their history, which, if it does not immediately lead to a cure, will at least be the first means that will enable us to do so.

From its appearing at this season, before the grain is formed, it is evident that the grain cannot constitute the food of this species of worm; and, as the husks and the rudiment of the grain appear to remain uninjured, does it not seem strange that even after the insect has left the flower, not a vestige of the grain should be found in it? Our wonder will cease when we find, however, that its food seems to consist of the pollen which is contained within the anthers, and (if we may so speak) its drink of the fluid which is found upon the stigma. Those who have studied *The Fructification of Plants*, are already informed that, by living in this way, the maggot has completely placed itself between nature and the production of seed or corn. It is known to them that, before seed can be produced, grains of pollen must burst upon the viscid fluid which is found upon the feather which surmounts the germ or rudimentary grain; and if this little worm consume either the grains or the fluid, and more particularly if it feed upon both, it effectually castrates the plant, and renders it unable to produce fruit. Such, then, appears to be the mode in which it effects its injury to our crops.

Let us now inquire whence comes this little enemy which thus is permitted to consume such precious food. In the summer evenings, from seven to nine o'clock, on observing attentively a wheat field destined to be affected with this disease, multitudes of very small flies, less than the tenth of an inch in length, will be seen flying about the ears which have newly left the sheath. Others will be seen alighted upon them; and, if they be examined with a magnifier, they will be found busily engaged in insinuating their tail (which may be contracted, or extended to a long tube, at pleasure), between the husks. With this apparatus they are depositing eggs about the centre of the flower. Sometimes they entangle themselves so much among its complicated parts, that they are unable to withdraw their ovipositor; in which circumstances, they are detained as prisoners, and being caught and devoured by other insects, become sacrifices to their posterity.

Nature, indeed, after they have laid their eggs, does not take much care of them, and by-and-by they all die either a violent or natural death. The eggs, however, which have been laid, are in due season hatched by the heat of the ear, and the maggots which proceed from them continue their depredations until they have attained their perfect size. When they have arrived at this state, they alter their form, and become dormant, but how and where, and in what state, they spend the autumn and winter, we are not very well able to say. Certain it is, however, that if they have not been killed, they will be found flying about ears of wheat the following June, depositing eggs in the flowers, in the identical manner as their forefathers have done since the creation.—*Ib.* 297.

Structure of a Grain of Wheat.—On laying open its skins, with a view to display the kernel, we find that these are two in number, as it has been already mentioned is the case with most seeds. Their thickness and coarseness vary with the kind of wheat, and the climate in which it has grown, The general law is, *that the more severe the climate, the thicker is the skin of the seed.* These skins, when broken by the process of grinding, almost wholly constitute the bran. The kernel we find to be composed of three parts, in conformity with the general structure of seeds which has been already related. One of these, however, constitutes almost the whole bulk of the grain. This is the nutritious matter which is contained in a little sack, close in every part except the base, by sap-vessels passing through which, this nutritious or farinaceous matter is, when the grain is springing, carried into the next part of the seed. This second part is a little scale, placed at the base of the grain, with its back lying upon (though not attached to) the sack of nutritious matter, and with the little plant, or third part, resting upon its face. Into this third part, or rudimentary plant, the sap-vessels, after performing the tour of the second part or little scale, enter, proceeding first towards what is to become the root, and then ascending into what is to become the stem. By means of them, when the grain is springing, the sack is drained of its nutritious matter, which is altered as it passes through the little scale, and ultimately converted into the specific form and substance of the little plant.

Of Plants cultivated for their Roots.—The plants cultivated for their roots, however distinguished by the botanist, may be regarded by the agriculturist as forming a group. They are produced for similar purposes, they are cultivated by the like means, and their effects upon the soil are nearly analogous. All the cultivated plants may be said to *exhaust* the soils which produce them, and by the manures which their consumption affords, may be termed improving or ameliorating crops, in contradistinction to others which may be termed non-ameliorating or exhausting crops. It is a general law, that plants which are suffered to ripen their seeds, exhaust the soil more than those which are taken from the earth before their seeds are matured. Our cereal grains—wheat, barley, oats, rye—are all allowed to mature their seeds, and are placed by the agriculturist in the class termed exhausting. Turnips, on the other hand, are not suffered to mature their seeds, and are even taken from the ground before their flowering stems are put forth; and the turnip accordingly is one of the least exhausting, or rather it is the least exhausting of all our crops, and this, coupled with the mode of cultivating it, and the quantity and quality of manure it affords, places it justly in the class termed ameliorating. The turnip, however, may be cultivated for its seeds, which are, in this case, suffered to be ripened, and then it becomes one of our most exhausting crops. In like manner the cabbage and the rape, if cultivated for their leaves, are ameliorating crops; if for their seeds, exhausting crops; and so are all plants cultivated for their oils, and on that account suffered to mature their seeds. The potato is, for the most part, allowed to ripen its seeds, and is a greatly more exhausting crop than the turnip; but the mode of culture applicable to the plant, makes it be placed in the class termed ameliorating. The beet is probably not materially different from the turnip, as regards its effects upon the soil, and, like it, placed in the class termed ameliorating: so are the carrot and the parsnip; but, as relates to their produce, the facility of raising them, and their uses, they stand far below the turnip, the beet, and the potato. The plants termed Legumi-

nous are exhausting or non-exhausting, merely as they are suffered to ripen their seeds. The bean, indeed, which is of this family, is practically held to be an improving crop, but this distinction it owes solely to the mode of culture. The bean, from its firm upright stems, admits of being cultivated at wide intervals, and so affords the means of tilling the ground very completely during its growth; but where the bean occurs in a rotation, it is generally held necessary to resort at intervals to the summer fallow. For this reason, it appears that the bean, if ranked in the class of crops termed ameliorating, must stand far below the bulbous or tuberous rooted plants, which, on the soils to which they are suited, are a substitute for the summer fallow, and render its occurrence unnecessary. The clovers are leguminous plants, and the general rule referred to applies also to them. If used for herbage, or cut early for food, they are in the class of plants termed ameliorating; if cultivated for their seeds, they are exhausting. Hemp and flax are plants which may be termed exhausting, both because the culture does not admit of any tillage of the ground during their growth, and because they produce no manure; but they serve to illustrate the general rule before referred to. If taken up early, they are less hurtful; if suffered to ripen their seeds, they are the most pernicious of our cultivated plants.

The bulbous and tuberous-rooted plants, as has been said, are all in the class termed ameliorating. The introduction into the culture of the fields of these useful vegetables may well be held to be one of the most important improvements in agriculture. It has enabled the husbandman to supersede summer fallows on all the lighter soils, to multiply the number of useful animals, and to maintain and increase the productiveness of the soil. One of the many means by which agriculture may be improved far beyond its present state, is by multiplying the objects of culture. Nature, it would appear, delights in variety; and we know not what objects of cultivation may yet be presented to human research. The history of the plants in question may well incite us to a diligent inquiry. The original of the potato is thought to be a bitter little plant in the mountains of Quito; and the turnip, in its natural state, is an insignificant plant, hardly distinguishable by the eye from some of the weeds of our corn-fields.—*Ib.* 271.

Sugar from the Beet Root.—In the *Farmer's Journal*, of March 30, is a letter on this subject from Mr. Philip Taylor, an English gentleman at that time in Paris, and the inventor of a mode of boiling sugar by steam, for which he took out a patent in 1817. The fact that crystallised sugar could be obtained from the beet root was first noticed by Margraff in 1747, but excited little notice till 1790, when Achard, another German chemist, directed the men of science in France to that subject. A report by the Institute, about this time, states that raw sugar so produced costs about 8*d.* per English pound. In 1810, colonial sugar had become so dear, that the government directed their attention to the process, but, notwithstanding this, it was still so imperfect as to be given up, with the ruin of several manufacturers, when the peace of 1815 admitted the free entrance to France of colonial sugar. Important discoveries, among others that of Mr. Taylor for boiling sugar by steam, were made in the process, and the number of manufactories gradually increased, so that, at this time, 1829, there are at least one hundred, from which were produced last year 5000 tons of sugar, worth 60*l.* per ton, or 300,000*l.*, the profit of which Mr. Taylor estimates at 15*l.* an acre: but he adds, "I am convinced the process may be so far improved, that sugar will be made in France from the best root at 36*l.* per ton, which will increase the profit to 24*l* an acre." After showing that the beet root succeeds best in the northern departments of France, and that, of course, it can be grown as well in England as on the Continent, he concludes, that though the price of land and labour be much lower in France than in England, yet that the balance of skill in favour of the latter country places it on a par with France, in point of the profits to be obtained from making sugar from beet. He adds, "with respect to *prices of produce*, the advantage will probably be in favour of the English farmer; for although the price of sugar is about equal in both countries, yet it is not sugar alone that is produced from the beet root which is cultivated: the pulp of the root, after the juice is pressed out, is excellent food for both bullocks and sheep, and I have seen beasts which have been brought in at 5*l.* per head, fattened upon it and sent to market in three months, and sold for 11*l.* The

value and importance of this part of the business will be duly estimated, when it is known that the pulp from each acre of beet root will fatten a bullock, and that the farmer will have as much manure for his other crops, as if he had grown turnips on the same land; and, of course, the same rotation of crops may be continued as is now found most beneficial. During the time of Bonaparte, the produce of sugar was about three per cent. on the root; now, as much as five per cent. is generally obtained; and as the beet root actually contains eight per cent. I think I have good ground for saying that the process admits of further improvement." A paper on the same subject, and to the same effect, will be found in the *Quarterly Journal of Agriculture* for May, in which the writer concludes "it is difficult to conceive that one half of the sugar consumed in Great Britain, or in all Europe, will not, in a few years, be home-made beet-root sugar."—*Gardener's Magazine, No.* 20.

To preserve Apples till late in the year.—After the apples have been kept for a week, and the superabundant moisture cleared away, wipe them with a dry cloth, and pack them into glazed jars in layers of sand dried in an oven. Fit a piece of wood into the mouth of the jar, and tie a bladder over it. Let the jars stand on a shelf in a room not subject to much change of atmosphere. Or lay a dry layer of pebbles in the hollow of a glazed jar; fill the jar with apples rubbed dry; fit a piece of wood into the mouth of the jar, cover it with mortar, and place it on a shelf in a dry room.—*Gardener's Magazine, No.* 20.

Vegetable Salt.—In Ashantee (*Bowdich's Mission*, p. 175.) there is a cedar, the leaves of which exude a considerable quantity of liquid salt, which crystallises during the day. There is, also, in Chili, a species of wild basil, which is every morning covered with saline globules, resembling dew, which the natives use as salt.—*Burke's Beauties of Nature.*

Hedges.—The best plan of producing a whin hedge is to throw up an embankment 3 ft. above the surface of the ground. Having fixed the line of the embankment, mark off a ditch outside of that line, 6 ft. wide at top, to be dug out 18 in. deep, and sloping, from the outside of the ditch, to 1 ft. wide at the bottom of the embankment. I ought to have observed, that the fence I am describing is used as a boundary to plantations. The line of the fence and the width of the ditch being marked off, begin to form the face of the embankment on the surface, either of sod or of stone, but sod is mostly used when the situation is on pasture land, and the top spit from the ditch comes in for that use. As the face of the embankment advances in height, keep it well backed up with soil from the ditch, until it be 3 ft. above ground, and the ditch 18 in. deep. Then finish off the top of the embankment 12 or 15 in. broad, and give the back of the fence a slope of 4 or 5 ft. At about the middle of the slope, and on the top of the embankment, a drill is drawn about 1 in. deep, in which the seeds are sown moderately thin, and then covered. The seeds are generally sown about the latter end of April or beginning of May. The trouble and expense further required are in keeping it clear from weeds the first two years, and well cut, in order to have it thick and close at the bottom.

This treatment being continued for four or five years, on a tolerable soil, an impenetrable fence will be reared, which will remain an effectual protection against cattle for many years. The whin is very hardy, and will grow in the most exposed situations, even on the sea beach.

Instead of the whin being a plague in the wilds of Wales, I can assure your correspondent, T. H., that it is not considered as such by the farmers in most of the counties in North Wales. The young whin of two or three years' growth is cut by them, and chopped up on blocks and benches with cross-hatchets, made for the purpose; and many have been at the expense of erecting mills for grinding the shoots to pieces. In this state it is given to their horses throughout the winter months. It is sown in large quantities for this purpose; and, I believe, there are few who have been in the habit of feeding their horses with the whin, who would not estimate an acre of this plant of much more value than an acre of hay. In the days of Evelyn it seems to have been a favourite plant, not only for hedges, but for the fodder of cattle; indeed, in North Wales, it constitutes the principal provender for the horses, from November to April.—*Gardener's Magazine, No.* 20.

Condensation by Trees.—In heavy fogs, on elevated situations especially, trees are perfect alembics: and no one that has not attended to such matters, can imagine how much water one tree will distil in a night's time, by condensing the vapour, which trickles down the twigs and boughs, so as to make the ground below quite in a float. In Newton-lane, in October, 1775 on a misty day, a particular oak in leaf dropped so fast that the cart-way stood in puddles, and the runs ran with water, though the ground in general was dusty.

In some of our smaller islands in the West Indies, if I mistake not, there are no springs or rivers: but the people are supplied with that necessary element, water, merely by the dripping of some large tall trees, which, standing in the bosom of a mountain, keep their heads constantly enveloped with fogs and clouds, from which they dispense their kindly never-ceasing moisture; and so render those districts habitable by condensation alone.

Trees in leaf have such a vast proportion more of surface than those that are naked, that, in theory, their condensations should greatly exceed those that are stripped of their leaves: but, as the former imbibe also a great quantity of moisture, it is difficult to say which drip most: but this I know, that deciduous trees that are entwined with much ivy seem to distil the greatest quantity. Ivy leaves are smooth, and thick, and cold, and therefore condense very fast; and besides ever-greens imbibe very little. These facts may furnish the intelligent with hints concerning what sorts of trees they should plant round small ponds that they would wish to be perennial; and shew them how advantageous some trees are in preference to others.

Trees perspire profusely, condense largely, and check evaporation so much, that woods are always moist: no wonder, therefore, that they contribute much to pools and streams.

That trees are great promoters of lakes and rivers, appears from a well-known fact in North America; for, since the woods and forests have been grubbed and cleared, all bodies of water are much diminished; so that some streams, that were very considerable a century ago, will not now drive a common mill.* Besides, most woodlands, forests, and chases, with us abound with pools and morasses; no doubt for the reason given above.

To a thinking mind few phenomena are more strange than the state of little ponds on the summits of chalk-hills, many of which are never dry in the most trying droughts of summer. On chalk-hills I say, because in many rocky and gravelly soils, springs usually break out pretty high on the sides of elevated grounds and mountains; but no person acquainted with chalky districts will allow that they ever saw springs in such a soil but in valleys and bottoms, since the waters of so pervious a stratum as chalk all lie on one dead level, as well-diggers have assured me again and again.

Now, we have many such little round ponds in this district; and one in particular on our sheep-down, three hundred feet above my house; which, though never above three feet deep in the middle, and not more than thirty feet in diameter, and containing perhaps not more than two or three hundred hogsheads of water, yet never is known to fail, though it affords drink for three hundred or four hundred sheep, and for at least twenty head of large cattle besides. This pond, it is true, is overhung with two moderate beeches, that, doubtless, at times, afford it much supply; but then we have others as small, that, without the aid of trees, and in spite of evaporation from sun and wind, and perpetual consumption by cattle, yet constantly maintain a moderate share of water, without overflowing in the wettest seasons, as they would do if supplied by springs. By my journal of May, 1775, it appears that "the small and even considerable ponds on the vales are now dried up, while the small ponds on the very tops of hills are but little affected." Can this difference be accounted for from evaporation alone, which certainly is more prevalent in bottoms? or rather have not those elevated pools some unnoticed recruits, which in the night time counterbalance the waste of the day; without which the cattle alone must soon exhaust them? And here it will be necessary to enter more minutely into the cause. Dr. Hales, in his Vegetable Statics, advances, from experiment, that "the moister the earth is, the more dew falls on it in a night: and more than a double quantity of dew falls on a surface of water than there does on

* Vide Kalm's Travels to North America.

an equal surface of moist earth." Hence we see that water, by its coolness, is enabled to assimilate to itself a large quantity of moisture nightly by condensation; and that the air, when loaded with fogs and vapours, and even with copious dews, can alone advance a considerable and never-failing resource. Persons that are much abroad, and travel early and late, such as shepherds, fishermen, &c., can tell what prodigious fogs prevail in the night on elevated downs, even in the hottest parts of summer; and how much the surfaces of things are drenched by those swimming vapours, though, to the senses, all the while, little moisture seems to fall. — *White's Silborne.*

On burning Lime with parings of Turf, Peat, Brushwood, &c.—The sites where the limekilns are to be formed, should have the soil dug up from off the subsoil, and carried, or thrown to a small distance, to be returned again when the operation of burning is finished, and the products removed. The best form of the site is circular, say five or six yards in diameter, and the following is the method in which the operation ought to be conducted. In the bottom, place a quantity of furze, heath, or ling, &c. upon which, place about two feet in thickness of the parings, if they are of a sufficiently combustible nature, if not, a layer of peat and parings to that depth. On the centre of this begin to form a funnel or flue of dry furze and peat, viz. furze in the centre, surrounded by about a peat in length. On the layer of parings, or parings and peat, place about six or eight inches deep of limestones, broken to a proper size (about three or four inches square), taking care to carry up the flue in the centre about two or more feet in diameter clear of the limestone; then lay on these another layer of furze, &c. parings and peat, about a foot deep; then limestone, carrying up the flue as before, and so continue stratum after stratum, till the whole ends in a cone with the flue for its apex. After this, brushwood, furze, heath, &c. parings and peat must be placed around the pile, to keep altogether, and if the soil be of a clayey texture, clods of clay may be piled around the whole. Having done this, ascend by a ladder to the top of the pile, and set fire to the furze in the centre of the flue, and it will burn down to the bottom of the pile,—set the whole into combustion,—and in the course of twenty-four hours the limestones will be completely burnt.—*Quarterly Journal of Agriculture.*

On packing Seeds for Exportation.—All seeds intended for exportation should be collected in a state of perfect maturity. The finer or smaller sorts may be enclosed in good paper bags, but those which are larger must be placed in layers, in very dry sand, and the whole be packed in air-tight vessels. The stratification in the sand is a precaution which would alone preserve their germinating property for many years, and during the longest voyages. Saw-dust is also a good material; but it is necessary to take the precaution of placing it in an oven, as we do bran, when we wish to purify it from mites, or from the eggs of other insects. Oleaginous seeds, which are liable to become soon rancid, such as those of the coffee-plant, the oak, nut-trees, the tea-tree, &c. require, when stratified, to be kept with great care separate from each other, in sand which is very fine and dry. Those which are of a middle size may be sent in their seed-vessels enclosed air tight, in small cups or pots, by covers of glass, fixed on with putty; or of wood, or of cork, imbedded in melted wax; or, which is better, in melted pitch. Juicy seeds must be separated from each other, as contact would sooner or later inevitably cause a fermentation which would destroy them. The late celebrated Dr. William Roxburgh dipped them into a solution of gum arabic, which formed them into masses. This, as it hardened, formed a coat which secured them against every principle of destruction, and enabled him to transmit them from the Coromandel coast to Europe, without undergoing the slightest change.—*Gill's Tech. Repos. April*, 1828.

On imparting Durability to Timber.—Some remarkable facts respecting the durability that may be given to timber, by artificial means, have been observed at Closeburn. The proprietor of that estate has for thirty years been in the constant practice of soaking all fir and larch timber, after it is sawed into plank, in a pond or cistern of water strongly impregnated with lime. In consequence of this soaking, the saccharine matter in the wood, on which the worm is believed to live, is either altogether changed or com-

pletely destroyed. Scotch fir-wood, employed in roofing of houses and other indoor work, treated in this manner, has stood in such situations for thirty years, sound, and without the vestige of a worm. In a very few years, fir-timber so employed, without such preparation, would be eaten through by that insect. It might perhaps be advisable, in all timber used for ship-building, to soak it for some days in lime-water.—*Mr. Monteath, in Edinburgh New Philosophical Journal, June*, 1828.

Transplanting Trees.—According to the method of Sir Henry Steuart, at Allanton, in Lancashire, the pit for receiving the transplanted tree should be opened 9 or 12 months before its reception. It is well known that in all windy seasons the tree shews a *weather side*, that is, its branches shoot more freely to that side, which is leeward during the prevailing wind, than in the opposite direction. Sir Henry recommends strongly that the position of the tree be reversed, so that the lee side where the branches are elongated, shall be pointed towards the prevailing wind; and what was formerly the weather side, being now turned to leeward, shall be encouraged by its new position, to shoot out in such a manner as to restore the balance and symmetry of the top. And lastly, a most important deviation in the new system is, the total disuse of the barbarous practice of *pollarding or otherwise mutilating and dismembering the trees which are to be transplanted.*

Indian Corn.—The French chemists have prepared excellent sugar from saccharine matter contained in the stem of this invaluable plant. In Germany, Indian corn is used entirely in the fattening of pigs, for which it is said to be very proper, attended with a saving of at least 15 per cent., as compared with the use of grain of any other description.

Making of Butter.—The degree of thermometrical temperature at which butter from cream can be obtained, ranges from 45° to 75° of the scale of Fahrenheit; and, from the annexed experiment, it appears that the greatest quantity of butter, from a given quantity of cream, is obtained at 60 degrees, and the best quality at 55 degrees, in the churn, just before butter comes; for, in the experiments made, it was found that the best rose four degrees during the operation of churning, though the temperature of the milkhouse was the same. Repeated experiments, made at this degree of heat, gave butter of the finest colour and quality, the milk being completely separated from the butter, which, when washed and made up in rolls, kept for a fortnight, without either acquiring smell or taste. At 60 degrees, the quantity is greater, but the quality much inferior, being soft and spongy, and giving out a considerable quantity of milk, when salt was applied, which may account for the additional weight. Several experiments were made with heat, up to 75°, the result of which, completely accounts for the great quantity of inferior butter made in the country.

By taking high heats, on purpose to accelerate the churning, the milk not being taken from the butter, it cannot keep either sweet or salted. When the heat exceeded 65 degrees, no washing could detach the milk from the butter, without the aid of salt: but when a quantity of salt was wrought well into it, and the mass allowed to stand for twenty-four hours, and then taken to a well of spring water, and repeatedly washed, the milk by this process was got out, and the butter resalted in good order.

LOCAL INTELLIGENCE.

New Settlement.—In the month of May, 1829, His Excellency the Governor authorised the formation of a settlement for Hottentots on or about the sources of the Cat River, a large stream situated close to the eastern frontier, and running through a tract of beautiful country, with a soil in many places as well adapted for cultivation, &c. as that of any part of the colony. The immediate object thereof was the furnishing an opportunity to such well-disposed Hottentots as might prefer becoming landholders, and procuring subsistence by the practice of cultivation and grazing instead of by servitude. The plan adopted was that of forming a number of separate parties, each under a responsible individual, and generally consisting of at least ten able-bodied men with all the locations, so disposed, as that in the event of necessity the whole population could be readily brought together. To become a member of the settlement the only qualifications required were and are, respectability of character and an avowal of a determination to conform