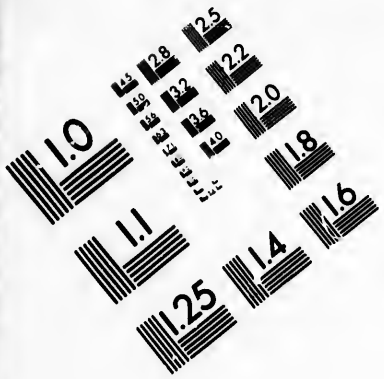

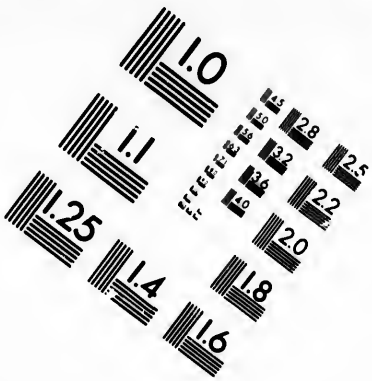

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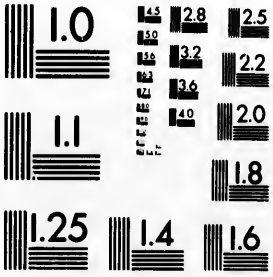

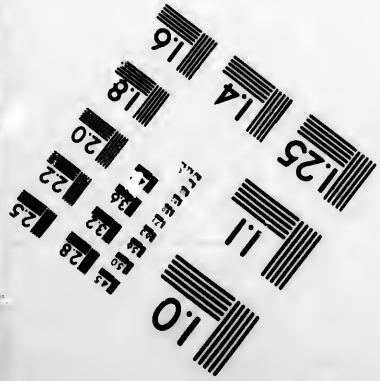

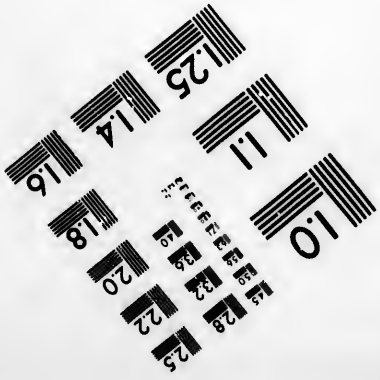

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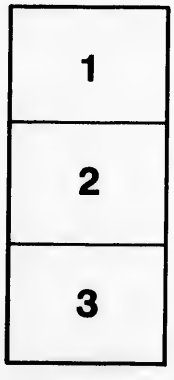

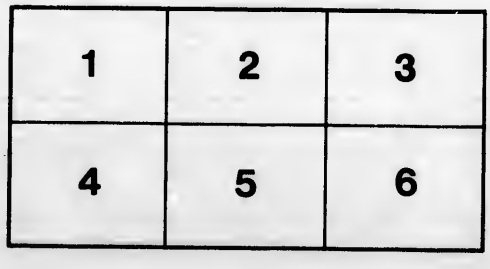

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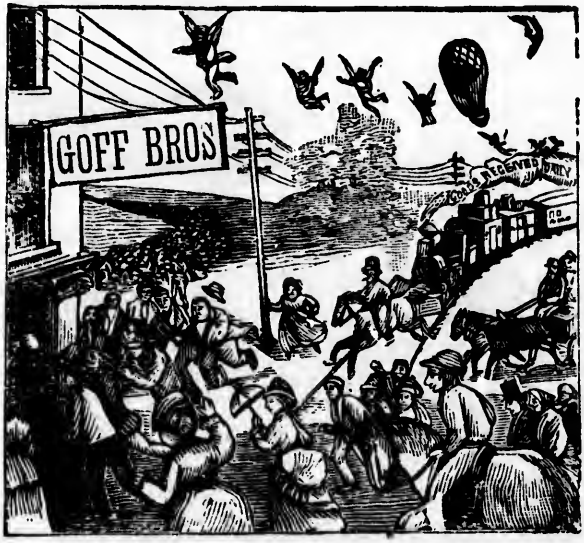

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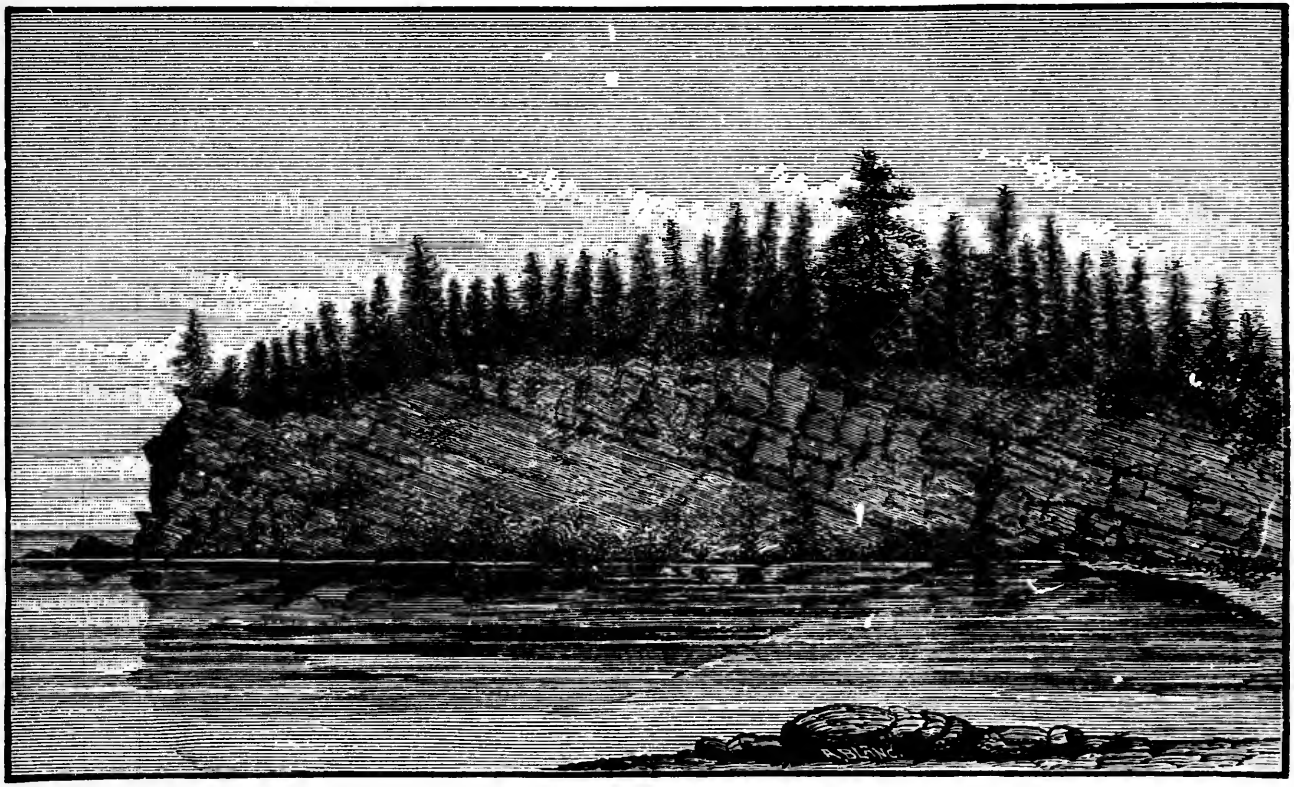


Rock Section at Holland's Cove, showing Inclined and Alternating Strata of Sandstone and Shale.

Rock Section at Holland's Cove, showing Inclined and Alternating Strata of Sandstone and Shale.

THE NATURAL HISTORY OF Prince Edward Island.

BY
FRANCIS BAIN.

AUTHORIZED FOR THE USE OF SCHOOLS BY THE BOARD OF EDUCATION.

Charlottetown, P. E. Island:
G. HERBERT HASZARD, PUBLISHER,
BROWN'S BLOCK, QUEEN SQUARE.
1890.

PREFACE.

THIS little work is intended as an introduction to the study of the natural history of Prince Edward Island, for the use of our Primary Schools. In it we have aimed to be concise and yet to present the important features of the subject; we have studied simplicity and yet regarded scientific accuracy.

We would here urge the importance of studying natural history in the field. No book information can take the place of this. Let the student be taught to collect and identify each object for himself. Thus will he form an intimate acquaintance with nature in all her beauty and richness, and learn the lofty art of investigating her hidden secrets for himself.

CONTENTS.

Geology.

Botany.

Zoology.

The Natural History

OF

PRINCE EDWARD ISLAND.

Geology.

GEOLOGY treats of the structure of the Earth and the mode of its formation.

The Geology of any particular country is an account of its rock formations and the causes which have produced them.

ROCKS OF PRINCE EDWARD ISLAND.

SECTION I.

GENERAL FEATURES.

1. The rocks of this Island consist principally of red sandstone and red clay shale, with some calcareous beds.

2. This may be observed on any of our coasts, where the rock, underlying the general covering of boulder clay, will be seen to be red sandstone and red clay shale arranged in beds of varied thickness.

3. THE SANDSTONES are formed of sand cemented together by chemical action. They are generally *fine-grained;* rarely coarse and pebbly, forming *conglomerate.* They are sometimes *thick-bedded* and *compact,* forming building stones; often thin-bedded and *friable.* In places they are hardened with lime, and are then *calcareous sandstones.* They are generally *micaceous,* that is, filled with glittering scales of mica. *Black manganese* in thin layers, and carbonaceous matter from the decay of ancient vegetation, frequently darken the strata. A band of grey colour marks the junction of a bed of sandstone and shale.

4. THE SHALES consist of imperfectly indurated red clays, and are soft and friable. They are sometimes mottled with grey spots, from the action of organic matter.

5. LIMESTONE is composed of carbonate of lime. When burned, it forms lime used for building and in agriculture. It is not common in the Island. Small deposits of nearly pure, light grey *concretionary limestone* occur at Miminigash and Crown Point. Generally, the beds are red-coloured and impure, being mixed with sand and clay, and are called *arenaceous limestone.* Many of them contain magnesia, and might be called *magnesian limestones.* A coarse rock, composed of lime, sand, and hardened masses of clay, is called *calcareous conglomerate.*

SECTION II.

FORMATION AND STRUCTURE.

6. All these various rocks were laid down in the waters of the Gulf, or along its coast, as beds of sand, clay, or limy material, obtained from the wear of the adjacent coast, and the decay of marine animals and plants.

7. In long process of time, chiefly by chemical action, they became hardened into rocks.

8. They all exhibit that arrangement in layers, or strata, which material deposited in water always assumes, and belong to the class called Sedimentary, Aqueous, or Stratified Rocks. The arrangement in layers is called the Stratification.

9. The Stratification is sometimes very *regular* and even, showing that the beds have been deposited in

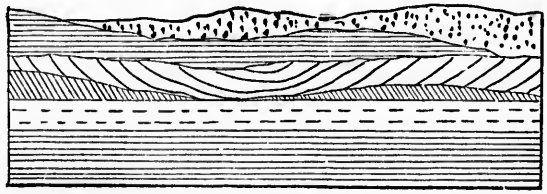


Fig. 1.

tranquil water (Fig. 1, *a*). Sometimes it is very *irregular* and broken, from the action of strong currents or tides, as shown at *b*, Fig. 1. Many beds are *ripple-marked*, proving their deposition in shallow water. Some beds, as seen at Rice Point, exhibit *sun-cracks*, showing that they were left bare at ebb-tide to dry in the sun.

10. *Terms.*—The smallest divisions of stratified rocks are called *layers.* A number of layers of the same material form a *stratum.* A number of strata, generally of dissimilar materials, constitute a *formation.*

SECTION III.

POSITION AND EXPOSURE.

11. The *original position* of our beds was horizontal, like that of all sedimentary strata.

12. *Present Position.*—By the commotions of the earth's crust, these beds have been disturbed from their original position and thrown into a number of ridges, called *anticlinals* (A, Fig. 2); with their intervening depressions, called *synclinals* (B, Fig. 2).

Fig. 2.

13. *Dip, Strike, &c.*—The inclination of beds is called the *dip.* The beds at D, Fig. 2, dip to the right; those at A dip right and left. Their direction at right angles to the dip is the *strike.* The exposure of the ends of inclined strata is the *outcrop* (D, Fig. 2). By the denudation of an anticlinal a large number of beds may be exposed in outcrop. Such an exposure affords us an opportunity of studying the lowest as well as the highest beds, as will be seen at D, Fig. 2.

14. *Example.*—In the Hillsborough Bay we have a fine example of denudation on an anticlinal. The Hillsborough Anticlinal runs nearly east magnetic through this bay, bringing up the lowest Permian rocks in Governor Island and Gallas Point, and exposing 2,000 feet, vertical depth, of beds in the outcrop on its shores.

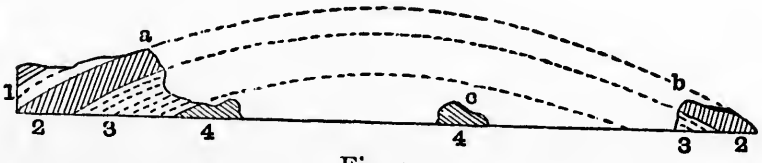


Fig. 3.

Denudation of Hillsborough Bay.—*a*, Tea Hill; *b*, Pt. Prim; *c*, Governor I. The figures 1, 2, 3, 4, refer to the sections of the Permian. Dotted lines show strata removed by denudation.

15. Let the student take his stand on the sandstone acclivity of Tea Hill, and look across the Bay to where the hills of Point Prim rise blue in the distance. Let him remember that those hills are a continuation of the same stratum on which he is standing, and that the vast intervening mass was removed by the same slow process of denudation that he sees in progress among the red cliffs at his feet, and he will have some small idea of the grandeur of geological operations, and the time required for their completion.

16. ANTICLINALS.—Five important anticlinals upheave the Island beds. The *Hillsborough Anticlinal*, already mentioned, whose median line runs south of St. Peter's Island, through Gallas Point and Cardigan, and south of Souris, as far as the East Point. The

South Shore Anticlinal, running down the Strait south of Wood Islands and Little Sands, and giving a northern incline to the rocks of those districts. The *Cape Tryon Anticlinal*, a short and broken one, extending from Cape Tryon towards Malpeque Bay. These anticlinals are all parallel, and run nearly east magnetic. They are all connected with the system of upheavals which elevated the Cobequid Mountains, in Nova Scotia.

17. Two anticlinals disturb the western parts of the Island. One runs along the Western Shore. The other crosses the Island near Cape Egmont. They are connected with the New Brunswick system of upheavals, and run northeast and southwest.

18. A *transverse upheaval* runs through St. Peter's Bay. Another crosses the Hillsborough Anticlinal at Nine Mile Creek, accompanied with a *fault* which has lifted the beds on its western side 300 or 400 feet above those on the eastern side, as seen in Fig. 4.

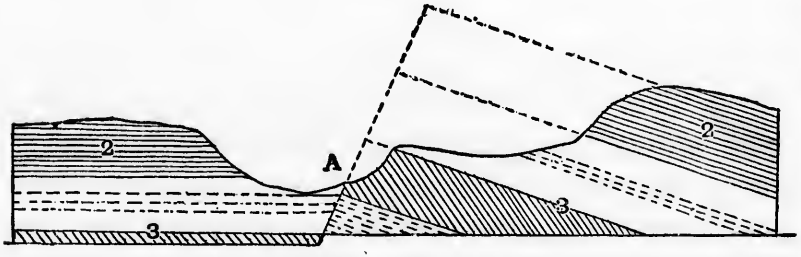


Fig. 4.

Section showing fault at Nine Mile Creek.
At A is the fault in the basin of the Creek. The numbers 2, 3, show the corresponding parts of the same beds. Dotted lines show parts removed by denudation.

19. *Means of Observation.*—By this series of movements—as illustrated in Figs. 3 and 4—the Island rocks have been upheaved and exposed to denudation. In the numerous outcrops thus afforded, we have ample opportunity of studying the beds of the entire system.

SECTION IV.

SURFACE FEATURES.

20. The denudation, or wearing down, of those beds of unequal hardness has produced the varied features of the surface of our country. The outcrop of a sandstone bed forms a hill or elevated tract, like Tea Hill, or Highfield. An outcrop of shale leaves a valley or low-lying district, like Emyvale, or Pownal. A bed of shale on the coast makes a bay, like Orwell Bay or Pownal Bay. A thick mass of sandstone forms a cape or headland, like Point Prim or Cape Turner. So, the whole form of the Island, and every surface feature, have been determined by the character of the rock and its denudation.

---

21. *Trap Rock.*—A dark mass of fine-grained Dolerite rises through the sandstone strata on the north-east end of Hog Island, in Malpeque Bay. It is a true volcanic rock, having been ejected from the interior of the earth in a molten state, hardening and altering the strata with which it came in contact.

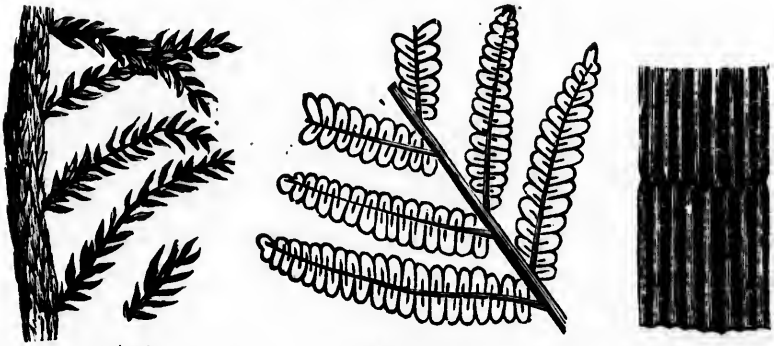
HISTORICAL GEOLOGY.

22. Geologists divide the rock structure of the globe into the following formations, beginning with the oldest: Laurentian, Cambrian, Silurian, Devonian, Carboniferous, Permian, Triassic, Jurassic, Cretaceous, Eocene, Miocene, Pliocene, Quaternary.

23. Each of these formations represents an extended period of time, the whole many millions of years.

The rocks of Prince Edward Island belong to the Permian and Triassic and hold a middle place in the rock-written history of the past.

SECTION I.



Walchia. Pecopteris. Calamite.

PERMIAN.

24. *Extent.*—The greater part of the Island belongs to this formation. It occupies Prince County, the eastern half of Queen's County, and the greater part of King's County.

25. *Kind of Rocks.*—Following is a section of its strata, their kind and depth, in descending order:

	FEET
1. Dark red Sandstone with few Shale beds	700
2. Red Sandstone, thick-bedded and compact ..	200
3. Red Shales with thin Sandstones	1,000
4. Grey, brown, and dark red Sandstones; red and mottled Shales, with calcareous beds..	800
Total thickness	2,700

26. The Lower Section (4) is seen at Gallas Point, Governor Island and St. Peter's Island. The sea shore cliffs in these places are seen to consist of grey and brown rocks, with beds of the usual red colour. They contain many remains of plants.

27. *Governor Island.*—Ribbed and jointed *Calamites* are here cast in the grey sandstone rock; and oval *Trignocarpi*, or seeds of sigillaria, are scattered in the clayey beds. There is a bed containing remains of plants fossilized in copper.

28. *Gallas Point* contains many silicified stems of ancient pine trees *(Dadoxylon)*, and dark, flinty splinters of this material, showing perfectly the woody structure, are scattered thickly about the grey, sandy floor of the sea beach. Some large stems are converted into layers of coal. Trunks of *tree ferns*, fluted stems of *sigillaria*, numerous *calamites*, and delicate *ferns*, painted in dark carbon, or traced in white calcite, lie on the rocky beds. Stems of *tylodendron*, imbricated and noded, form beautiful flinty shafts, one to two inches in diameter.

29. *St. Peter's Island.*—Here the grey and brown beds contain numerous remnants of tree ferns and tylodendra, with remains of the great calamite, *Calamites Gigas*, which towered forty feet above the grey soil of the Permian swamps. Small quantities of iron ore are found in these localities, and some thin beds of concretionary limestone.

30. At *Miminigash* the red shales and dark red sandstones, impregnated with iron, contain many beautiful impressions of ferns. *Pecopteris arborascens* is the most abundant. Its large, thick-leaved, regularly-cut fronds, sometimes ten feet in length, leave very distinct impressions on the fine-grained beds. *Alethopteris* is a more delicate and less symmetrical fern. *Cyclopteris* has rounded leaflets with delicate circular veinlets. *Sphenopteris* has graceful, wedge-shaped leaflets. *Neuropteris* has many delicate nervures on its ovate leaflets. At this place, the large, ribbed leaves of *cordates* are common, and the whorled leaves of *Annularia* lie like shadowed stars on the bright red matrix, with plume-like branchlets of *Walchia.*

31. The Great Shale Beds (3) of the third division are chiefly interesting on account of the extensive denudation which they have undergone. The low lands about Pownal, Orwell and Nine Mile Creek, have been formed by them ; also the extended plains on the west of the Island. Their denudation has produced the basin of the Hillsborough Bay, and, to a large extent, effected the separation of Prince Edward Island from the mainland. The associated sandstones are drilled

with burrows and casts of worms, many of large size. Corals—*Cyathophillum* and *Petraria*;—and fragments of *Encrinites*, with sponges, are found in the calcareous beds.

32. The Compact Red Sandstones (2) of this division form the bulk of Tea Hill that towers its green swell over the northern shores of the Hillsborough Bay; the same range continued south of the West River; the hills of Belfast and Upper Montague, and the hilly tract from Souris to East Point. They contain few organic remains, but afford much superior building stone.

33. The Upper Section of the Permian (1) comprises the rolling and picturesque district around Charlottetown harbour and its river estuaries, and most of the Island to the eastward. Its varied and gently-undulating surface everywhere affords pleasing scenery, and a rich and easily cultivated soil.

34. Beds sufficiently compact for building stone are found among its sandstones, as at Mount Edward quarry; but much of the rock is friable and shaley. The calcareous sandstones bear corals, tentacles of encrinites, and minute spines of fishes. The few vegetable remains found are: fragments of silicified wood of *Dadoxylon*, stems of *Araucarites*, branches of *Walchia*, and imperfect casts of ferns and *Calamites*, with numerous remains of *Fucoids*.

35. *The Life* and general conditions of the Island during the Permian may be gathered from the foregoing account of its rocks and fossils.

36. Widespread sand shoals filled the southern basin of the Gulf of St. Lawrence. Its surges broke in foam on the broad reefs, or rolled in sullen darkness over abysses shadowy with fucoids, or gay with the living blossoms of corals and encrinites. Spined and plated fishes scoured its deeps, and cephalopods left their chambered shells in its drifting sands. Sometimes a breadth of land rose above the waters. Its marshy borders waved green with thickets of reed-like calamites. Here the Great Calamite rose its fluted shaft forty feet above the reeking soil. On the firmer ground groves of tree ferns wove fairy canopies of their frondage. Above these, like some tall minaret, shot the sculptured trunk of a rare sigillaria. All the drier hills were dark with pine trees; while plumy thickets of ferns and cordates, and whorled annularia and tylodendra, and crowned cycads, filled every opening in the forest and crowded down to the restless margin of the wave.

SECTION II.

Palm Leaf Dinosaur. Voltzia.

TRIASSIC.

36. *Extent.*—The Triassic rocks cover the north-western half of Queen's County, including that extensive range of hills stretching across the Island from Bonshaw to New London, and eastward to Wiltshire and Rustico. They also include some areas in King's County.

37. *Position.*—They lie horizontally on top of the Permian beds, not being disturbed by the Permian anticlinals.

38. *Kind of Rocks* (1).—At the base of the formation is a thin stratum of quartz pebble conglomerate. It appears to be of drift origin, and is seen at North River, Murray Harbor Road, and Bear River. A mass of sandstone conglomerate, hardened with lime, in Mill River, is on the same horizon, and proves the consolidation and upheaval of the Permian previous to the deposition of the Trias.

39. The remaining 300 feet (2) of the formation is composed of sandstones, often thick-bedded, and sometimes calcareous, with some beds of shale.

40. *Organic Remains* are rare. Particularly so in the inferior beds. *Calamites*, tree ferns, *Walchia*, *Voltzia*, branches and wood of conifers of different species from those of the Permian, and the palmate leaves of palm trees have been found.

41. At New London part of the jaw of a Dinosaurus reptile, called *Bathygnathus borealis*, was discovered, in digging a well, on the farm of Mr. D. McLeod. This animal has been described as a "moderate-sized alligator, scaled and crested, mounted erect on a pair of powerful posterior limbs which enabled it to leap with the agility of a frog." Its jaws were short and powerful, and armed with sabre-shaped teeth, four inches in length. Its whole structure evinced great strength, agility, and ferocity. It belonged to the most perfect family of reptiles that ever appeared on the earth. Its length was about ten feet, and with a bound of sixteen or eighteen feet it leaped upon its prey.

42. All the Formations (22) between the Trias and the Quaternary are wanting in Prince Edward Island. Probably during that time the Island stood above the sea-level.

SECTION III.

QUATERNARY.

43. *The Boulder Clay* everywhere spreads over the surface of our Island, covering up the older rock formations. Its upper part forms our soil, so varied and so fertile. Sections of it are everywhere to be

seen in the red banks of our rivers and bays. It is composed of clay, sand, gravel, and angular stones. The latter are often *glaciated*, that is, smoothed and scratched by the action of ice. It varies in depth from one foot to fifty feet. It is not stratified.

44. The Boulder Clay was formed by the *Great Glacier*, a moving sheet of terrestrial ice, which, during a period of intense cold, covered North America down to lat. 40° N.

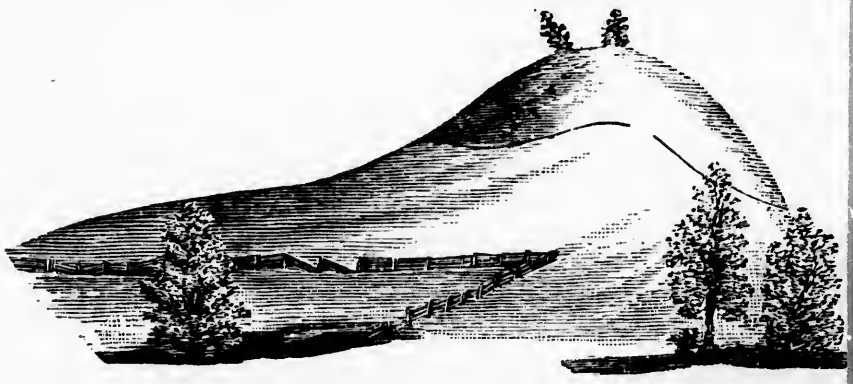
45. *Glacial Strice.*—The rock under the boulder clay is often seen to be smoothed, scratched and grooved. This was effected by the movement of the vast mass of ice forming the Great Glacier. The direction of the heavier grooves and scratches is generally east-south-.st. They are well seen at Simpson's Point, Bay View; French River; Cable Head; St. Peter's Bay, and many other places.

46. *Granite Boulders* and masses of other crystalline rocks are scattered over many parts of the surface of the Island. They are most numerous in a line from Cape Wolf to north of St. Peter's Bay. They were brought from New Brunswick by the moving ice mass whose course was east-south-east.

47. *The Stratified Sands and Clays* which underlie the swamps and barrens of Prince County, and the deposits of *Brick Clay* which are found in many places, were formed by sub-glacial streams and lakelets during the existence of the Continental Glacier.

48. *Glacial Moraines.*—As a glacier is a mass of ice moving down a valley or slope of land, it carries

with it quantities of clay, sand, and stones. These it deposits at its lower extremity. In time they accumulate into heaps and ridges, forming moraines.



Moraine on St. Peter's Road.

Elevated ridges frequently occur in the boulder clay formation, filled with worn and rounded stones and gravel. They are moraines, formed in the latter days of the Glacial Era, when the great Continental Glacier had been reduced to local glaciers.

49. Examples may be seen on St. Peter's Road, six miles from Charlottetown; on the upper North River, below More's Mills; on the Brackley Point Road, near Black River School; in Charlottetown Park, and many other places. They may always be recognized by the number of well-rounded stones which they contain.

50. *Surface Deposits.*—Accumulations of *muck* and *peat* are found in all swampy places over the Island. Large deposits are near Alberton, on Lennox Island, and at Squirrel Creek, in Prince County. They were

all formed by the growth and decay of vegetable matter in damp situations. They form, when properly composted, valuable manures.

51. *Mussel Beds* are found in nearly all our bays and river estuaries. They are often many acres in extent. Altogether, they probably comprise 3,000 acres. They have been formed by the accumulation of decayed shells of oysters, mussels, quahaugs, and other marine mollusks. They are from two to twenty-five feet in depth, and have grown up from the bottom with the amassing of sediment in the beds of the rivers or bays. Mussel mud is extensively used as a fertilizer. The lime which it contains is its chief active agent. It holds small quantities of nitrogen and phosphoric acid.

52. *Sand Dunes*, or ridges of blown sand, sometimes forty feet in height, stretch along much of our northern coast. They are of a tawny grey color, the particles of silica being washed free from iron, clay, and other red coloring matter.

53. *Subsidence.*—A most interesting geological feature is the secular subsidence which our Island, in common with a large part of eastern America, is undergoing. The land is sinking at the rate of about two feet in a century. Evidence of this is distinctly seen on the borders of salt marshes, where stumps of trees, firmly rooted in the soil where they grew, are sunk considerably below tide-level. In some cases these stumps are found covered up with many feet of marsh growth.

54. This slow subsidence is a fair example of the

great movements which, in the long course of time, have depressed or elevated extensive regions of the earth's surface.

Soil.

55. The soil of Prince Edward Island is generally a fine, red, sandy loam, rich and easily cultivated. Its superior quality makes the Island the best agricultural Province in Eastern Canada. Indeed, red sandstone soils the world over are the most valuable for agriculture. Several varieties of soil occur on the Island corresponding to the rock formations whose disintegration has produced them.

56. *1st*, The great shale beds (No. 3) of the lower Permian (25–31) afford heavy clay soils. They are often swampy. Originally they were covered with a growth of black spruce, larch, ash, and willow. In cultivation they are cold and damp, ill-suited for tillage, but, under good management, supply rich pasturage. The stratified clays of the Boulder formation afford very clayey, wet soils, requiring draining for profitable culture.

57. *2d*, The stratified sands of the same formation, occurring in parts of King's and Prince Counties, supply very light, sandy soils. They were originally clothed with shrub pines and birches, and the prostrate *arbutus*. They are not profitable for culture unless well filled with humus.

58. *3d*, The best and most extensively distributed soil is formed by the Boulder Clay formation which

overlies the varied and rolling districts of the Trias and upper Permian, and the sandstone tracts of the lower Permian. It is a fine, sandy loam, friable and easily tilled. It was originally clothed with noble deciduous forests of beech, birch, and maple ; and the annual harvest of their autumn-tinted leaves, decaying in the shadows at their feet, accumulated a store of the richest humus. This, mixed with the upper layer of earth, formed the productive virgin soil of our Province, capable of yielding such bountiful harvests.

Useful Minerals.

59. *Building Stone* of good quality is procured from the beds of compact sandstone already referred to. Section 2 of the Permian (32) contains a large quantity of the best material. Its outcrop at the entrance of Charlottetown Harbor, along Tea Hill range, and at Belfast and Souris will afford an unlimited supply.

60. *Limestone.*—Besides the small beds of concretionary limestone mentioned previously (5), the calcareous conglomerates of the lower Permian sometimes afford limestones sufficiently good to burn for agricultural purposes. They are found at Park Corner, Freetown, the vicinity of Summerside, Kildare, and many other places in Prince County.

61. *Iron.*—Red Hematite and Manganetic Iron Ore are found in small quantity at Gallas Point and St. Peter's Island. Bog Iron Ore is found under many swamps. *Manganese*, in cellular concretions, is obtained from similar situations.

62. *Copper.*—Sulphide and Carbonate of Copper occur at Gallas Point and Governor Island, but not in sufficient quantity to be of practical value.

63. *Gold*, in very minute quantity, was discovered, in 1885, on the western shore of the Island. It occurs in connection with black sand—*magnatite*—in beds of calcareous conglomerate and on the sea shore.

GLOSSARY.

Anticline. Strata inclined in opposite directions.

Araucarites. Belonging to the Araucariæ, a genus of pine trees, some of which are found growing in S. America.

Calcareous. Containing lime.

Carbonaceous. Coaly. Decayed vegetable or animal matter is often found in a black, coaly condition in the rocks.

Commotions of the Earth's Crust. These are produced by various causes. The cooling and contraction of the interior of the globe cause the crust to be crumpled and thrown into ridges. The action of volcanic fires causes local disturbances. And the gradual contracting and expanding of vast bodies of strata produce, in time, disturbances of great magnitude.

Concretionary Limestone. This consists of masses of limestone, more or less pure, formed by concretion, or the accumulation of limy material round particular centres, in the substance of sandstone rocks.

Conglomerate. Water-worn fragments of rocks, or pebbles, cemented together by another mineral substance.

Crystalline Rocks. Rocks in which the component parts are in a crystalline state. As these rocks have generallybeen formed from ordinary sediments by the long continued action of heat or chemical forces, they are called ***metamorphic rocks.*** On our Island they only appear in drift brought by ice from the Primary districts of New Brunswick. Diorite, felsite, quartzite, hornblende and gneiss are found associated with granite boulders.

Dadoxylon. Meaning "pine wood." A name given to a genus of fossil pine trees.

Denudation. The carrying away of a portion of the solid materials of the land by running water, by which the inferior rocks are laid bare.

Drift. Material carried from a distance by ice action.

Encrinites. Animals allied to the star-fish, but with their bodies and numerous arms elevated on a long flexible stalk. The small divisions of the arms are called ***tentacles.***

Fault. The interruption of the continuity of strata in the same plane, accompanied by a crack or fissure, caused by the elevation of the strata on one side or the depression of them on the other side.

Fish-Spines. Ancient fishes generally had their fins supported by strong spines. These are often found as fossils. In our rocks they occur from one-eighth of an inch to six inches in length.

Fucoids. Species of algæ, represented on our own shores by the common rock-weed ***(Fucus vesiculosus).***

Granite. A rock composed of grains of quartz, felspar, and mica, all in crystalline form. The hard, clear, glassy part, in which the other crystals seem imbedded, is the quartz. The felspar is less hard and in white or flesh-coloured crystals. The mica is often black and always easily recognized by its splitting readily into thin scales. The hard, grey, granular boulders found scattered over the surface of some parts of the country are granite.

Historical Geology treats of rocks in their chronological order, or the order in which they were formed. All strata formed at the same time are said to be on the same geological horizon.

Organic Remains. Remains of animals and plants.

Permian. The most recent of the Paleozoic formations, named after the ancient kingdom of Permia, in Russia, where it is extensively developed.

Ripple-Mark. This is a series of wavy ridglets formed by the ripple of the waves on a sand beach, and is often seen preserved in the rocks.

Sandy Loam. A soil containing 60 per cent. of sand is called a ***sandy loam.***

Sediment. Material thrown down from suspension in water.

Sigillaria. Tall trees with fluted stems and erect, sword-shaped leaves, or fronds, very abundant in the Carboniferous.

Silicified. Petrified, or mineralized by ***silex*** (flint).

Syncline. Strata inclined together.

Transversals. Lines of upheaval crossing the general direction of the anticlinals in a district.

Trias. The most ancient of the Secondary formation; name from ***tria,*** three, because of its threefold division in Europe.

Tylodendron is now known to have been a large coniferous tree, of which the trunk, foliage, and fruit have been found fossil at St. Peter's Island. The pith, an inch and a half in diameter, is the most common part found.

Botany.

Botany is that branch of natural history which treats of plants.

1. The sandstone swells of Prince Edward Island are everywhere clothed with a rich and varied vegetation. Its flora is much the same as spreads over the rest of Eastern Canada, but its dry and fertile soil produces a greater abundance of deciduous forest trees and the flowering plants which usually accompany them.

2. On the rolling districts, affording the best agricultural soils, Beech, Yellow Birch, Maple, Oak, and White Pine flourish, with an undergrowth of Mountain Maple, Rowan, Hazel, Elder, and thick-tangled brambles. Grasses carpet the soil, jewelled with roses, convolvuli, and sweet-scented violets. These plants belong to the Central Canadian flora.

3. On the cold soils of the swamps and barrens a different class of vegetation abounds. Spruces and sparse-foliaged Larches, Poplars, Birches, Aspens, and moss-grown Firs form the timber growth; while a

thick, shrubby carpet of Andromeda, Ledum, Whortleberries, and prostrate Arbutus spreads at their feet. These are members of the Sub-Arctic Flora, inhabiting the far north of Canada, and penetrating even within the Arctic Circle. Thus, two distinct floras occupy the two distinct classes of soil common on the Island.

4. Other peculiarities are noticeable. The Cedar is confined to Prince County, and we never saw the Arum, the Calapogon, or the Grand-flowered Habinaria in other parts of the Island. The Hemlock is not found east of St. Peter's. The assemblage of plants on the Triassic hills is something different from that on Permian districts. The sand dunes have a flora peculiar to themselves. And amid the surf-lashed skerries of our rocky coasts, the lover of Nature will find a distinct field of study in the Algæ, Fucoids, and Corrallins of marine growth.

5. In order to understand the descriptions of plants it is necessary that the student should become acquainted with their general structure and the names applied to their different parts.

STRUCTURE OF PLANTS.

6. The principal parts of a plant are the root, the stem, the branches, the leaves, and the flowers.

The Root attaches the plant to the earth, and is generally the means by which it draws nutriment for its growth. Roots are of various forms, being *branched*,

as in forest trees; *fibrous*, as in most grasses; *spindle-shaped*, as in the carrot; *tuberous*, as in the potato; *bulbous*, as in the turnip; *repent* or creeping, as in the strawberry; and *floating*, as in duck-meat.

7. The Stem, or Stalk, is that part of a plant which rises above the ground. It may be *woody*, as in the trunks of forest trees; or *succulent*, as in herbs.

Culm, or Straw, is the stem of grasses.

Scape is the stem of flowers. It springs from the root and bears the flower, but not the leaves. Ex. White Violet.

Peduncle is a flower stalk which springs from the stem or a branch, and bears the flowers but no leaves. *Pedicils* are divisions of the peduncle.

Petiole is the foot-stalk of a leaf.

Frond is the stem and leaf in one, as in the Ferns.

Stipe is the stem of Mushrooms, or Toadstools.

LEAVES.

8. Leaves are the organs by which plants respire, and in which the sap is prepared for the growth of the plant. They assume a vast variety of forms.

Leaves are *Simple* or *Compound*. Leaves are called simple when only one grows on the same petiole.

Fig. 1.

Common forms of simple leaves are the following:

Ovate, egg-shaped (1).—The length is greater than the breadth, and the base is broader than the apex. Ex. Birch. *Obovate* is this form reversed. Ex. Bear Berry.

Oblong (2), having the length several times greater than the breadth. Ex. Solomon's Seal.

Fig. 2.

Fig. 3.

Lanceolate (3), spear-shaped. It is several times longer than wide, and tapering towards the two extremities. Ex. Narrow-leaved Plantain.

Linear, narrow, with the two sides almost parallel. Ex. most Grasses.

Cordate (4), heart-shaped, having the length greater than the breadth, with an ovate form hollowed out at the base. Ex. Cowled Violet.

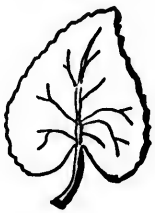


Fig. 4.

Saggitate, shaped like an arrow-head. Ex. Arrow-head.

Fig. 5.

Lyrate (5), shaped like a lyre. Ex. Lyre-leaved Sage.

9. *Runcinate*, cut into several acute segments pointed backwards. Ex. Dandelion.

Sinuate (6), cut into rounded lobes. Ex. Sugar Maple, Red Oak.

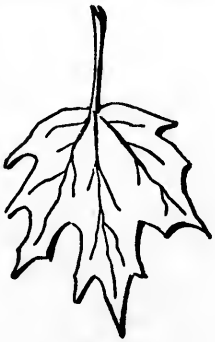


Fig. 6.

Pinnatifid.—The leaf is transversely divided into lobes, but the divisions do not reach the midrib. Ex. Polypodium.

Fig. 7.

Lancinated (7), cut into numerous irregular portions. Ex. Buttercup.

Serrate (8), the border being cut into notches like the teeth of a saw. Ex. Yellow Birch, Rose, Nettle.

Double Serrate (9), having large teeth beset with smaller ones. Ex. White Birch.

Dentate, beset with projecting teeth on the margin. Ex. Beech.

Nerved, having small, longitudinal ribs running from one extremity to the other. Ex. Narrow-leaved Plantain.

Fig. 8.

Veined, when the veins form a network through the leaf. Ex. Apple, Mullen.

Fig. 9.

Compound Leaves.

10. When several leaves, or leaflets, grow on a common foot stalk they are called compound. Ex. Sumac.

Ternate (10) is when the foot-stalk bears three leaves. Ex. Clover.

Fig. 10.

When a petiole has a number of leaflets growing on its sides, it is called winged, or *Pinnate* (11). Ex. Rose, Mountain Ash.

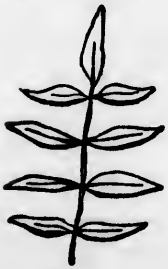


Fig. 11.

Radical is when leaves proceed directly from the root, generally round the stem, but never on it. Ex. Dandelion.

Stellate, or Whorled (12), is when leaves grow in a circle round the stem. Ex. Bedstraw.

Fig. 12.

APPENDAGES.

11. *Stipules* are leafy appendages to the leaves, or their foot-stalks.

Bracts are leafy appendages to the flower, or its foot-stalk.

THE FLOWER.

Fig. 13.

12. The Flower consists of :—

The *Calyx* (*b*, Fig. 13) is the exterior envelope, and enclosed the whole flower when it was in bud.

The *Corolla* (*a*, Fig. 13) is the delicate coloured part of the flower. It is generally divided into a number of sections called *petals.*

Inside the corolla are the *stamens ;* and inside the stamens, and surrounded by them, is the *pistal* or pistals.

The stamens consist each of two parts, the *anther* and the *filament.*

The pistal consists of three parts, the *germen*, or seed bud, the *style*, and the *stigma.*

CALYX.

13. The calyx is sometimes divided into a number of distinct parts, or leaves, called *sepals.* When it is formed of one piece only, it is called *monophyllous.*

Perianth is the calyx when contiguous to the petals which it surrounds.

Involucre is the calyx remote from the flower. Ex. Bunch Berry.

Ament, or *Catkin.*—This consists of a number of scales attached to a thread. Each scale is the calyx of a separate little flower, a number of which form the ament, as in Willow and Poplar. Sometimes these scales are hard and persistent, forming *cones*, as in Pines.

Glume, or Palæ, is the calyx of the grains and grasses, covering up their tiny blossoms.

Volva is the membrane covering up some of the Mushroom tribe when young.

Calyptra, or Hood, is the cap which covers the fructification of many mosses. Ex. Urn Moss.

Corolla.

14. When the corolla consists of one piece, or petal, it is called *monopetalous.* When it is formed of more than one petal, it is called *polypetalous.*

Fig. 14.

The following are common forms of monopetalous corollas:

Campanulate (14), having the form of an open bell. Ex. Convolvulus.

Infundibuliform, shaped like a funnel. Ex. Morning Glory *(Ipomea).*

Rotate (15), wheel-shaped. Ex. Speedwell.

Labiate (16), irregular and gaping, like the mouth of an animal. Ex. Skull Cap.

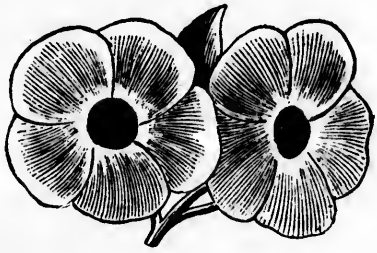


Fig. 15.

Polypetalous Corollas.

15. Any corolla with more than one petal is termed *polypetalous.* Ex. Rose.

Fig. 16.

Papilionaceous (17), or butterfly-shaped. This consists of four separate petals. The upper and largest is called the *vexillum*, or standard (*c*). The two side petals, under this (*b*), are called the *alæ*, or wings; and the lowest (*a*), placed between the alæ, is called the *carina*, or keel. Ex. Pea, Bean.

Cruciform.—Cross-shaped corollas consist of four petals placed so as to form a cross. Ex. Turnip, Cabbage.

Fig. 17.

INFLORESCENCE.

16. Inflorescence means the mode of flowering. The kinds more worthy of notice are:

Umbel (18).—This is the kind of inflorescence produced when several flower stems proceed from a

common centre in a whorl, all rising to about the same height. Ex. Carrot.

Fig. 18.

Verticillate (19), when the flowers, on very short peduncles, or sessile, form rings at intervals round the stem. Ex. Mint.

Fig. 19.

Raceme, or Cluster (20).—This consists of numerous scattered flowers, each on its own proper stem, the whole proceeding from a common stalk. Ex. Currant.

Fig. 20.

Spike (21).—This has many sessile flowers on a common erect peduncle. Ex. Speedwell *(Veronica officionalis)*, Wheat, Barley.

Panicle (22).—This is a loose cluster in which each pedicle bears several flowers. Ex. Oat, Meadow Grass.

Fig. 21.

Spadix has the flowers close packed together on a succulent stem, and this partly enclosed in a spathe, or sheath. Ex. Indian Turnip, Cala.

Fig. 22.

Corymb (23).—This is an erect raceme in which the lower flower stalks are long and the upper ones short, so that the whole assemblage of flowers forms a nearly level head. Ex. Spear-leaved Golden Rod, Yarrow.

Capitum or Head (24). This consists of sessile flowers crowded together in a globular form. Ex. Clover.

Fig. 23.

FRUIT OR SEED.

17. *Pericarp* means any vessel or substance enclosing the seed. Common forms of pericarps are:

Capsule.—This is a dry, woody kind of seed vessel, which, as it ripens, discharges its seeds by dividing into several parts called valves. The seed vessels of the Mullein and Plantain are capsules.

Fig. 24.

Siliqua is a seed vessel of two valves, one on each side of a middle partition. Ex. Cabbage, Turnip.

Legume is the pod of the Pea and Bean.

Drupe has a fleshy pulp enclosing a bony nut or stone which contains the kernel, or proper seed. Ex. Cherry, Plum.

Nut is a dry, bony fruit enclosing a kernel. Ex. Hazelnut.

Bacca, or Berry, is a succulent fruit in which the seeds lie loose in the pulp. Ex. Currant, Gooseberry.

Compound Berry.—This consists of many simple berries, each containing a seed, united into one mass. Ex. Raspberry.

Pome, or Apple.—This is a fleshy pericarp containing a capsule which encloses the seeds. Ex. Apple, Pear.

CLASSIFICATION OF PLANTS.

18. All plants have been arranged in the following natural divisions:

DIVISION I. FLOWERING PLANTS.

Class. I. *Dicotyledons.*—Plants having the stem formed of bark, wood, and pith distinct. Leaves net-veined. Embryo with a pair of cotyledons. Parts of the flower mostly in fours or fives.

Class II. *Monocotyledons.*—Stem without distinction of bark, wood, and pith. Leaves parallel-veined. Embryo with one cotyledon. Parts of flower in threes.

Class III. *Gymnosperms.* — Plants with naked ovules and seeds.

DIVISION II. FLOWERLESS PLANTS.

Class IV. *Acrogens.*—Plants with a stem containing woody tissue and vessels.

Class V. *Thalogens.*—Plants having no distinction of stem and leaves.

CLASS I.—DICOTYLEDONS.

RANUNCULACÆ.—*Crowfoot Family.*

Wild Rose.

19. The Buttercups, which spread so much golden bloom over our summer pastures, are good examples of this family. We have four. All have bright yellow flowers, with five petals, five sepals, and many stamens and pistals.

Ranunculus acris, or Tall Buttercup, is two feet high, has a branched stem and lancinate leaves. *R. repens*, or Creeping Buttercup, has the main stem prostrate, but the flower stems erect, leaves ternate. Both these frequent our pastures and meadows, but *R. repens* weaves a dense mat of foliage in the border of running streams; and Seaside Buttercup creeps along the skirts of salt marshes.

The Marsh-Marigold *(Caltha palustris)* is a large, succulent plant with broad, rounded-cordate leaves, and many large, yellow flowers. In May and June its golden bloom adorns the damp borders of the swamps.

Meadow-rue *(Thalictrum pubescens)* grows in creek

bottoms, rising up through the alders, five feet in height. It has decompound leaves of a smoky blue color, and large masses of anthers showing as the most conspicuous part of its bloom.

Coptis trifolia is a low, swamp plant, spreading its smooth, ternate leaves over the moss-grown soil, and erecting its white, star-like flowers on scapes six inches long. Its roots are bright yellow and thread-like, and the plant is sometimes called Gold-Thread.

All this family is more or less acrid or poisonous.

SARRACENIACEÆ.—*Side-Saddle Flowers.*

20. The Pitcher-Plant *(Sarracenia purpurea)* grows in the lonely swamps of King's and Prince Counties. It has a whorl of large, inflated, tubular, radical leaves. They form natural pitchers, generally filled with water. Its purple flower is raised on a scape a foot in height, and contains a single, much-expanded stigma. Birds resort to it for drink in times of drouth. The plant is considered a valuable medicine in cases of small-pox.

21. *Corydalis glauca* belongs to the family of *Fumitories.* It has decompound, smoky-blue foliage, and bright red and yellow flowers of irregular form, with a long spur to the upper corolla.

CRUCIFERÆ.—*The Cross-Flowers.*

22. The plants of this family have four petals arranged like a cross, and their seed-vessels a siliqua or a silicle.

The Sea Rocket, a prostrate, fleshy-leaved plant, found growing on the bare, drifting sands of the sea-coast; and the Shepherd's Purse, a weed of our door-yards, are our native representatives of this extensive family. Our great field and garden plants, Turnips, Cabbages, Cauliflowers, &c., belong to it. These were wild European plants, and have been brought to their present perfection by careful cultivation. The original wild cabbage still grows on the cliffs of Dover, and other parts of the south coast of England. The soil and climate of this Island are eminently adapted for the cultivation of these plants, and large crops are produced. Of Turnips, we raise annually 1,200,000 bushels.

VIOLACEÆ.—*The Violets.*

23. We have two common violets, the white and the blue—*Viola blanda* and *V. cuculata.* Both are fair and abundant blossoms of our spring. The sweet-scented White Violet blooms the first week in May; but its sky-tinted companion waits till the middle of the month, when it mixes its flowers with the golden disks of Dandelions. The Marsh Violet grows in wooded swamps.

CARYOPHYLLACEÆ.—*The Pinks.*

24. We have four Sandworts. Two of them are inferior, straggling, narrow-leaved plants of the field borders. The other two are fleshy-leaved plants, growing on the edges of salt marshes. Two Chickweeds

and two Mouse-eared Chickweeds are troublesome weeds in our grain fields.

To this family belong the Corn Cockle, and the Pinks and Sweet William of our gardens.

ACERACEÆ.—*The Maples.*

25. We have four Maples. *Acer saccharinum*, or Sugar Maple, is a noble tree, with dark, rugged trunk and spreading branches, rising a corona of five-lobed leaves with rounded sinuses 60 feet above the rich soil where it grows. Its blossoms are yellow, and its leaves turn yellow in autumn. Its timber is close-grained and strong. Used in machinery and for ship-building, also in cabinet-work and for engraving. Indians make axe-handles and baskets of it. From the sap of this tree maple sugar is manufactured. Each tree will give about four pounds. The annual production on the Island is 25,000 pounds.

The Red Maple *(A. rubrum)* is a smaller tree. Its blossoms are red and its leaves assume a brilliant crimson in autumn. The leaves have acute sinuses, which distinguishes them from those of the Sugar Maple. Its timber is also softer and less valuable.

Striped Maple *(A. Pennsylvanicum)* is a small tree, with the young bark striped with olive and green. Its large leaves are three-lobed, rounded at the base, and have a soft, rich texture. The greenish flowers are in drooping racemes.

Mountain Maple *(A. montanum)* grows as a thick under-shrub in the forests on the hilly parts of the country. Its small, rugose leaves are five-lobed; racemes, large, erect.

Much of the brilliant coloring of our autumn woods is produced by the rich tints of the ripened maple foliage.

Oxalidaceæ.—*The Wood-Sorrels.*

26. The Wood-Sorrel *(Oxalis acetocella)* opens its single, white, veined chalice on the brown, leafy floor of the great birch woods. Its ternate, obcordate leaves, often purple underneath, spread a most delicate tracery of verdure along the silent forest shadows. *O. stricta* is a field plant with small, yellow flowers.

27. The Wild Balsam *(Impatiens fulva)* belongs to the family of the same name. The bright yellow blossoms of this plant, in September, make many an alder coppice by the brooks flame with their brilliant coloring. Its flowers have a large, conical nectary; and the stem of the plant has that singular pellucid appearance characteristic of the family.

Anacardiaceæ.—*The Cashew Family.*

28. The Sumach *(Rhus typhina)* is a handsome, pinnate-leaved shrub, six to eight feet high, with dense panicles of purple fruit. It is grown in gardens and shrubberies for its ornamental appearance. The whole plant is valuable for tanning white leather.

R. toxicodendron, or Poison Oak, is a shrub two feet in height, found growing in dry, rich woods. It is acrid and poisonous.

LEGUMINIFERÆ.— *Pod-Bearers.*

29. This family has generally papilionaceous corolla and the seeds always in a pod.

We have but few native representatives of this extensive family. The Sand-Pea *(Lathyrus maritimus)* covers the rough sand-dunes with its bright purple blossoms. The Vetch *(Vicia Craca)* everywhere adorns the field borders with its blue clusters, or climbs the shrubbery to hang high its floral banners.

The White, or Creeping, Clover, and the little Yellow Clover are native plants. The Red and White Dutch Clovers, so extensively cultivated, are introduced European plants. Alsike Clover came from Sweden. All the varieties of cultivated Beans have originated from the European *Fabia vulgaris*. The garden Peas come from *Pisum sativum* of the south of Europe. Scarlet Runners are natives of South America.

...EÆ.—*Rose Blooms.*

30. This beautiful family is well represented in our flora. We have three Wild Cherries. The Choke Cherry *(Prunus Verginiana)* is a large tree with erect racemes of flowers. The more common Red Cherry *(P. Pennsylvanica)* has racemes few-flowered and not erect. *P. depressa* is a low shrub growing along river banks.

The common red Raspberry *(Rubus strigosus)* is very abundant along fences and in stump lands. Its fruit makes a delicious preserve, for which it is extensively used. The black-fruited Brambles *(R. villosus and frondosus)* are easily distinguished from the red by their larger growth and conspicuous, white flowers. They are found in the newer parts of the country. *R. occidentalis* has a long, slender stem, *R. trivialis* is procumbent and armed with recurved prickles, while *R. Canadensis* creeps along the borders of swamps, raising its ternate leaves on long petioles above the moss-grown soil. All three have black fruit, and are commonly called Dew Berries.

Our delicious Strawberry, so abundant in pastures and wild lands, is *Fragaria Verginiana.* It is the receptacle of this plant which is the edible part. The seeds are like little points on its surface. Where land is dressed with mussel mud, strawberries nearly disappear. The large, cultivated fruits are improved varieties of several different species of wild strawberries growing in various parts of the world.

We have five *Potentillas. P. anserina*, or Silver Weed, creeps along the borders of salt marshes. It has handsomely-cut, pinnate leaves, silvery underneath, and brilliant yellow flowers, resembling buttercups.

Amalanchier Canadensis, *A. ovalis*, *A. botriapium;* and *Pirus arbutifolia* and *P. melanocarpa* are all small trees or shrubs, growing in swamps and thickets, bearing conspicuous white blossoms in May and small edible fruit in harvest. They are sometimes called Wild Pears.

Our common wild Rose is *Rosa Carolina.* It is a beautiful shrub, generally three feet high, but in thickets mounting taller than a man's head. It has brilliant red, five-petalled flowers. Sweet-Brier grows wild in many places. The Cinnamon Rose, with double flowers, grows about old gardens.

CULTIVATED TREES AND SHRUBS.

31. The cultivated Plums have all been derived from *Prunus domesticus*, a native of Asia Minor. The garden Cherries are from two trees growing wild in Britain. The Pear is also a native of Britain. Our most valuable orchard fruit is the Apple. All our magnificent standard varieties have been produced from the wild crab tree, of which different species exist in Europe, Asia, and North America. The best varieties are propagated by grafting. Great difficulty has been experienced in obtaining kinds suited to our climate. At present, Duchess of Oldenburg, Emperor Alexander, Red Astracan, Northern Spy, and Ben Davies are the most successful kinds grown.

Apple trees raised from seed will bear in six or seven years, but their fruit is often inferior and quite unprofitable for market.

The common Scotch Roses were derived from a wild British species. The Damask Roses came from Syria. The China, Noisette, and Tea Roses were all derived from the *Rosa Indica* of the East. The Climbing Rose is a Prairie Rose.

CUCURBITACEÆ.—*Cucumbers.*

32. We have no native members of this family, but some of our most valued garden vegetables belong to it. The Great Gourd *(Cucurbita maxima)* produces fruit of immense size, sometimes weighing 212 pounds. It is round, depressed at the ends, and ribbed. The Pumpkin is *C. pepo.* Squashes are *C. melo-pepo.* They are always flat, with prominent ribs on their sides. Vegetable Marrow is *C. ovifera.* The common Cucumber is *Cucumis sativus.* All these were originally from India and the East; but the Melon came from Jamaica.

RIBESACEÆ.—*Currants.*

33. We have three species of wild Currants. Two of them frequent the swamps; and one, with smooth, red berries, puts on its foliage earlier than any other plant of our borders. The wild Gooseberry is a small fruit but of good flavor. The garden Currants and Gooseberries are English plants.

ŒNOTHERACEÆ.—*Evening Primrose Family.*

34. Willow-herbs are tall, showy plants with loose spikes of bright purple, four-petaled flowers, and long capsules filled with downy seeds. They grow in wild lands and are especially luxuriant on newly burned grounds, often covering acres with one blaze of purple bloom. The Evening Primrose, with yellow, octandrious flowers, grows about fields and on the exposed fronts of clayey sea-cliffs.

CORNACEÆ.—*Cornels.*

35. The Bunch Berry *(Cornus Canadensis)* is a dwarf cornel six inches high. Its white, petal-like involucre and bunches of bright scarlet berries make this very common plant well known. We have five other species of Dog Woods, all small trees or shrubs of the rich alder bottoms. The bark of *C. Circinata* is esteemed in medicine as a tonic and astringent.

UMBELLIFERÆ.—*Umbelflowers.*

36. The Wild Carrot, Wild Parsnip, Cow Parsnip, Water Parsnip, and the spotted and poisonous Cicuta, or Water Hemlock of the swamps all belong to this family and bear the characteristic flowers in umbels. Besides these native plants, the cultivated Carrot, Parsnip, Celery, and Caraway are members of it also. These were all wild European plants, and have been brought to their present perfection by long cultivation.

ARALIACEÆ.—*The Ivy Family.*

37. We have three Aralias, plants of the wild wood. *A. nudicaulis* is nearly stemless with one large tri-quinate leaf, and a long scape with a globose three-umbel of greenish flowers which ripen into a mass of black berries. It is called Wild Sarsaparilla, and the root is highly esteemed in medicine. *A. hispida* is two feet high, stem hispid. *A. racemosa* is a shrub four feet high, with ternate and quinate leaves, and numerous umbels of flowers.

CAPRIFOLIACEÆ.— *Woodbines.*

38. The common Elder *(Sambucus pubens)*, useful on account of its large-pithed stems, needs no description. *Viburnum nudum* and *V. acerifolium* are shrubs of the swamps, six to eight feet high, with opposite leaves and large cymes of bloom, and oval berries. *Linnea borealis* is a beautiful little creeping evergreen of the ancient moss-floored fir wood. It has opposite, ovate-round leaves and two pale, rose-colored flowers drooping on an erect peduncle.

COMPOSITÆ—*Composite Flowers.*

39. This is the largest family of the vegetable kingdom. We have fifty species belonging to it, besides many cultivated plants.

The peculiarity of the family is the aggregation of a number of small florets on a common receptacle, surrounded by a common involucre like the Dandelion and the Daisy.

Eupatorium purpurium is a swamp plant five feet high with rough, ovate-lanceolate, serrate leaves, and a large head of purple flowers. The root is valuable in medicine.

We have thirteen Asters. *A. salicifolius* is a smooth-stemmed plant, two feet high, with linear-lanceolate leaves, and a spreading panicle of showy, reddish-blue flowers. It delights in the shadowed borders of streams. *A. mutabilis* is a very variable plant with large purple flowers, growing abundantly on the heavy

soils of Prince County. Sometimes it is three feet high, sometimes not six inches, and then a perfect mass of bloom. Where it creeps down on to the sands of the sea shore, its leaves grow thick and fleshy. *A. cordifolius* grows abundantly on the north side of the Island, mingled with the brighter flowered *A. salicifolius.* It has cordate leaves. *A. puniceus* is the greatest of the Asters, mounting its panicles of purple flowers six feet high in the damp shades of swamps and creek bottoms. *A. multiflorus* and *A. dracunculoides* are tall, white-flowered species.

40. The Golden Rods, with their tall panicles of yellow flowers, are common plants, and add much to the golden blaze which autumn spreads over our land. The most common along fences are *Solidago gigantia* and *S. altissima.* Both are three to four feet high, have large, dense panicles, and broad lanceolate leaves. *S. altissima* has broadest leaves. *S. stricta* grows on heath lands. It is two feet high, has smooth leaves, and a compressed, dense panicle. *S. lanceolata* has narrow lanceolate leaves and flowers in a flat head, or corymb. *S. levigata* grows on salt marshes.

Everlastings are grey-colored, woolly plants, with narrow leaves and dry, lusterless, everlasting flowers. They grow by fences and in neglected fields.

Our four Groundsels all have beautifully-cut, sinuate foliage. *Senecio aureus* and *S. balsamite* have showy umbels of bright yellow flowers.

41. Three Thistles haunt our fields. *Cirsium arvensis* is the prickly perennial of old pastures. *C.*

discolor is the large, bright-flowered biennial growing in wild lands. *Soncus oleraceus*, or Sow Thistle, has large yellow blossoms, and is a troublesome weed in grain fields.

Prenanthes serpentaria, or Lion's Foot, has large, palmate-sinuate radical leaves, and purple flowers, and is reputed to cure the bite of the rattlesnake.

Wild Lettuces are erect plants, five feet high, with smooth, clasping, runcinate leaves, and a large, loose panicle of small yellow or voilet flowers. The milky juice of these plants has been recommended as a substitute for opium.

42. The hooked Burdock, the yellow-flowered Tansy, the bitter Wormwood, the Milfoil, with a thousand segments to its leaves; and the biennial Mayweed and perennial Daisy, both with large white flowers, are plants which obtrude themselves in every waste place, and are too abundant in cultivated fields.

The golden disk of the Dandelion *(Taraxicum dens-leonis)* blows round our sheltered yards the first week of May, and is then welcomed among the few early blossoms of our tardy springs. Its runcinate leaves are all radical. After its blossoms fade, the scape grows much taller and bears a globular head of downy pappus, called "blow balls" by the children. The Autumn Dandelion has a dry flower-stalk and yellow pappus, and blooms till October.

LOBELIACEÆ.—*Lobelia Family.*

43. *Lobelia inflata* is a plant less than a foot high

with an erect raceme of pale blue, monopetalous flowers, and large inflated seed-vessels. It is acrid and esteemed as a valuable drug.

VACCINIACEÆ.—*Cranberries.*

44. The shrubby Blueberry bushes grow in profusion on inferior, sandy soils. We have five species. *Vaccinium Tennellum* and *V. Pennsylvanicum* are valuable for their abundance of agreeable fruit The fruit of the latter is of superior quality.

Two species of Cranberries are common on low grounds. Both are trailing plants with large, reddish and acid fruit, valued for tarts.

ERICACEÆ.—*Heath Blooms.*

45. This hardy family of northern plants is represented by many beautiful and interesting species in our damp woods and swamps. The Bearberry *(Arctostaphylos uva-ursi)* is a low, evergreen plant, with roundish, leathery leaves, and a bundle of bright red berries. It is very abundant on sandy barrens in King's County. The North American Indians value this plant as a powerful astringent and tonic.

Epigæa repens is the May Flower, the earliest blossom of our spring. The plant is a trailing evergreen, and its sweet-scented, pinkish blossoms appear before the snows of April are well gone from the cold barrens where it grows.

The rusty-leaved Labrador Tea; the brilliant *Rhodora*, that blooms before it leaves; the *Andromeda* with pale, drooping racemes; and the Kalmia, called Laurel, with showy corymbs of rose-colored blossoms, are all shrubs of swampy and barren lands.

Five species of Pyrolas are little evergreen plants of the dry fir wood, with large, sweet-scented blossoms of a greenish or reddish white color. *Moneses uniflora*, resembling the Pyrolas, has a single odorous blossom.

ORNACEÆ—*Ash Family.*

46. The Black Ash grows in wet swamps. It is a large tree, with handsome, pinnate foliage and large, deep-blue buds. Leaflets sessile. The White Ash assumes drier ground. Its leaflets are petiolate and white beneath. Ash wood is much used for hoop-poles and baskets, as well as in cabinet work.

CONVOLVULACEÆ.—*Bindweeds.*

47. *Calystegia sepium*, or Convolvulus, is an elegant climbing plant, with sagittate leaves and large, delicate, pinkish, bell-shaped flowers, growing along river banks.

SOLANACEÆ.—*Nightshades.*

48. The Common Nightshade would not be worth mention if it were not a dangerous narcotic. It resembles an inferior growth of potato plant.

CULTIVATED PLANTS.

49. The Potato is the most valuable root grown for the support of the human family. It is a native of the elevated table lands of Mexico and Peru. From these it spread to the northern parts of America, and, in 1586, was taken by Sir Walter Raleigh from Virginia to Ireland. The soil and climate of Prince Edward Island are eminently adapted for its culture, and more potatoes are here grown, in proportion to extent of territory, than in any other part of America. The annual production is 6,000,000 bushels. Fresh potatoes contain seventy-five per cent. water; sixteen per cent. starch; one and a half per cent. protein compounds; besides sugar, fat, and fibre. As human food, they are light and healthful. They are extensively fed to domestic animals. Starch is manufactured from potatoes, on a large scale, in factories.

New varieties of potatoes are produced by planting the balls which contain the seeds. They come to perfection in four years, but unless showing good qualities the first year, they are not worth cultivating. The varieties at present are endless, every district in which they are grown having a special variety of its own.

The Tomato, abundantly cultivated in our gardens, is a native of Mexico and South America. It requires to be started early, under cover, to ensure a crop of ripe fruit.

SCROPHULARACEÆ.—*Figworts.*

50. This family has monopetalous corollas.

The Mullein, which grows on waste lands, is an erect, grey, woolly plant with large leaves and a long spike with bright yellow flowers, from three to six feet high.

Speedwells are an interesting group of little plants growing everywhere about our fields and roadsides, spangling the sward, like dew, with their tiny pearl-tinted blossoms. The flowers of *Veronica officionalis* are blue and spiked, those of *V. serphyllifolia* are numerous and white tinged with blue. Eye-bright flowers abundantly in August along the way-sides.

LABIATÆ.—*Labiate-Flowers.*

51. The nine species of this family growing about our fields and brooks are of little interest except as flowering weeds. Only the fragrant mints which grow on the damp borders of streams are useful in medicine and confectionery. They have ovate-lanceolate leaves and dense whorls of small flowers, with exserted stamens. They grow about two feet high.

PRIMULACEÆ.—*Primroses.*

52. Star-Flower *(Trientalis Americana)* is a pure white, star-like flower that, in warm June days, blows along every shadowed border. It has seven sepals, seven pointed divisions of the snowy corolla, seven stamens, a single pistal, and about seven smooth, lanceolate leaves arranged in a single whorl. Brook-Weed is a rank-growing plant with small, white flowers, which

often buries in its succulent foliage the flowing waters of wood-land streams.

Sea Lavender *(Statice limonium)* belongs to the family of Leadworts. It grows on salt marshes and is easily recognized by its large panicle of small, blue flowers. Its root has been recognized from ancient times as a useful astringent.

PLANTAGINACEÆ.—*Ribworts.*

53. We have three Plantains. *Plantago major* has smooth, ovate leaves spreading close to the ground, and a dense pike of inconspicuous flowers. It is abundant about house yards. *P. lanceolata* grows in meadows and has ribbed, lanceolate leaves. *P. maritima* has linear, fleshy leaves, and finds its home on the dingy field of the wet salt-marsh.

SALSOLACEÆ.—*Saltworts.*

54. Goose-Feet are tall, woody-stemmed weeds with mealy leaves, frequenting gardens. Saltwort *(Salsoli kali)* is a decumbent, herbaceous plant spreading a heavy mass of spiny foliage on the dry, clear sand of the drifted dunes.

CULTIVATED PLANTS.

Common Beet *(Beta vulgaris)* has several varieties. The blood-red Garden Beet is grown for table use. Sugar Beet, from which sugar is made, is not grown to any extent here. Mangold Wortzel is the large, field beet raised for feeding stock.

POLYGONACEÆ.—*Buckwheats.*

55. The Polygonums, or Knot-Weeds, are mostly worthless weeds, with lanceolate leaves and minute flowers, growing on damp grounds.

Rumex acetocella is the Sorrel of our wild lands, so well known for its acid leaves. *R. sanguineous* is a large, red-leaved herb growing by streams and used as a salad.

CULTIVATED PLANTS.

Buckwheat *(Fagophyrum esculentum)* belongs to this family. When well prepared, buckwheat meal is a nutritious human diet. Though grown here to a less extent than in the rest of eastern Canada, yet 90,000 bushels are annually raised.

Rhubarb is a native of the Himalayas and Tartary. It is grown plentifully in our gardens and is the earliest vegetable for pies.

ULMACEÆ.—*Elms.*

56. Though not abundant, some magnificent Elms *(Ulmas Americana)* grow on the damp, rich soils of the eastern and western counties. The Elm is a large tree, towering its symmetrical corona of double-serrate, unequal leaves above the rest of the forest where it grows. Its timber is less liable to split than other wood, and is used for hubs of wheels, mill-work, and keels of ships. Elms make ornamental shade-trees about dwellings.

CUPULIFERÆ.—*Mast-Bearers.*

57. The Beech is one of the noble trees of the forest. Its leaves are ovate-oblong, ribbed and dentate. Its well-known triangular nuts are food for forest animals, and hogs are sometimes turned to the woods to fatten on them. Beech is the most valuable wood for fuel. It is used by turners and cabinet-makers. This tree grows on dry sandstone soils.

Red Oak grows in many parts of the Island. There was once a large oak forest at Tracadie. Oak is the most durable of our hard-woods.

The Hazel grows abundantly in rich woods. It is a much-branched shrub, three to four feet high, with oblong-ovate leaves, and long rostrums to the involucre of its nuts. Of our two species, *Corylus Americana* bears the best nuts. Hazel-nuts yield about half their weight of oil, called *nut-oil*, and used by painters.

BETULACEÆ.—*The Birches.*

58. We have three Birches, all large trees of the forest. *Betula papyracea* is the tall White Birch with ovate, double-serrate leaves, and nodding strobiles. The twigs of this tree are slender and drooping, and its silver-white stem and graceful, bowing head of foliage make it the virgin beauty of the forest. The Micmac Indians made their tents and canoes of its bark, and it was formerly used in place of tar-paper in building. The timber is useful for fuel.

Poplar Birch is a smaller tree with white bark and shining, deltoid leaves, growing in swamps.

The Yellow Birch *(B. excelsa)* is one of the most majestic and useful trees growing on the Island. It is abundant everywhere on dry, rich soils. Its trunk, sometimes six feet in diameter, is straight and majestic; and its broad-spreading arms bear its great corona of foliage sixty feet aloft. It has yellow bark, ovate, serrate leaves, and erect strobiles. Its timber is the most useful hard-wood we possess. In ship-building, carriage-building, mill-work, machinery the construction of bridges and houses where strength is required, in cabinet and many other trades, it is the timber most valued and used. Large quantities are exported as ton-timber.

Alder is a much-branched shrub growing on river-banks and wet grounds. Its rigid, oval cones have narrow scales.

SALICACEÆ.—*Willows.*

59. All our native Willows are shrubby bushes bearing bright yellow catkins in early spring. They are generally called Sallow Bushes. We have four native Poplar trees. The Aspen Poplar, with roundish leaves, is the most common. Balsam Poplar is fragrant and common as a shade tree about dwellings. In Willows and Poplars the male and female blossoms are on separate trees.

CLASS II.—MONOCOTYLEDONS.

Iris.

SMILACEÆ.—*Sarsaparillas.*

60. The Wake-Robins are plants of the woody shadows, opening their conspicuous white, purple-veined flowers before the forest trees put on their leaves. They have three ovate, pointed leaves in a whorl, a flower with three petals, and a large, purple berry. *Trillium cernuum* is used as a tonic in medicine.

LILIACEÆ.—*Lilies.*

61. We have six species of Convellarias, all smooth, oblong-leaved plants with small white or yellow flowers, growing in the wild-wood or the swamps.

Medeola Virginica has two or three whorls of lanceolate leaves and three yellowish flowers with turbinated corolla. It is a plant of the dry wood, blooming in July.

JUNCACEÆ.—*Rushes.*

62. The grass-like stems of four species of Rushes grow in great cespitous clusters or scattered fields around our ponds and marsh borders.

IRIDACEÆ.—*Flags.*

63. Irises, with their beautiful blue and yellow flowers and sword-shaped leaves, bloom abundantly round fresh water ponds in June. The root-stalks are used in medicine.

Blue-Eyed Grass is a small plant, with a handsome blue flower, blooming abundantly in meadows.

ORCHIDACEÆ.—*Orchids.*

64. Of this singular family, remarkable for the beauty and fragrance of its flowers, we have fourteen species.

In Orchids the styles and filaments are not distinct as in other flowers, but united into a single mass called the *column.*

In the genus *Habinaria* the corolla is ringent; lip spurred at base, and much divided. Plant two feet high with a large spike of flowers. *H. psycoides* is white-flowered, *H. grandiflora*, purple-flowered.

Ladies' Tresses have spiral spikes of white, odorous flowers. They grow in meadows.

Orchis tridentata grows in swamps.

Pagonia and Calapogon are beautiful purple flowers of the swamps; but the Ladies' Slippers, scarce less showy, open their large purple lips in the shade of the dry beech wood. Dragon's-Claw and Twa-Blade are curious plants of this family springing amid the fallen leaves of the deciduous forests.

65. Reed-Maces are flag-like plants, three feet high, with a dense, dark-colored, cylindrical, club-like spike, growing in wet bogs. The Indian Turnip grows in rich swamps. Water Arum is a large, creeping, succulent plant with cordate leaves and a white oval spathe, growing in water.

CYPERACEÆ.—*Sedges.*

66. Club Rushes and Sedges are tall, grass-like plants growing in wet and boggy places. The Club Rushes have spikes of perfect flowers. The Sedges have the male and female flowers in separate spikes. We have thirteen or more species of these plants. Cotton-Grass has large heads of white, cotton-like down. In July it spreads a white veil over the shadowy verdure of the swamps.

GRAMINÆ.—*Grasses.*

67. Twenty-six distinct species of grasses weave a carpet of rich herbage in our fields, woods, and marshes. The most valuable of the native Grasses is June Grass *(Poa pratensis)*. It grows six to eighteen inches high, has a spreading, bluish panicle, and long, linear leaves of a dark green color. It is abundant in rich pastures. In company with the more slender Meadow-Grass *(Agrostis vulgaris)* and the dry, capillary panicles of Hair-Grass *(Trichodium)*, it forms the fine mat of herbage which spreads over dry, natural pastures. On wet lands, *Poa compressa* and *P. aquatica* are the grasses

which flourish. *P. nervata* is a tall grass with a diffuse, nodding panicle, which grows along the borders of streams. Tall Fescue *(Festuca elator)* grows on river intervals, and is one of the most nutritious fodder grasses known. *Calamagrostis* is another tall grass of the intervale. It has a branched stem. Panic-Grass, Cinna, and Canary-Grass grow on the margin of ponds.

Sand-Grass *(Psamma arenaria)* spreads a rigid verdure over the dunes and binds their shifting sands with its long, creeping roots. Three species of *Spartina* grow on our marshes. The smallest, *S. juncea*, is cut for fodder where it is abundant, as on the broad marshes of the East River, above Mount Stewart.

CULTIVATED GRAINS AND GRASSES.

68. Wheat was originally a worthless grass found growing on the borders of the Mediterranean. By cultivation it has been brought to its present perfection. There are several hundred varieties and sub-varieties of Wheat. Winter and Spring Wheat are but varieties of the same plant, and can be changed from one to the other. Only Spring Wheat is grown on this Island. The principal varieties at present sown are White-Russian, White-Fife, and Red-Fife, but new kinds are constantly being introduced. Over 600,000 bushels are annually grown.

69. The Oat *(Avena sativa)* is the grain most extensively grown in this Province. Its native country is supposed to be Asia, and from the earliest times it has been raised as food for horses. Oatmeal is superior

to wheat flour in nutritive qualities. Good Oats have seventeen per cent. of *Protein compounds;* average of Wheat contains fifteen per cent. Oats also have seven per cent. of oil. Good Oat straw is worth, for fodder, half as much as hay. Oats grown on Prince Edward Island are of superior quality, when raised with care. More than 3,000,000 bushels are annually produced. Black, Norway, and White-Oats are the kinds grown.

70. Barley is not extensively grown on the Island. Little over 100,000 bushels are raised. Barley has been cultivated by mankind from the earliest times. It was used as food by the ruder nations, but for the support of animals by the more cultivated. It is now chiefly raised for brewing. Being as nutritious as Wheat or Oats, it makes excellent food for horses, cattle or hogs.

Rye is here cultivated only in very small quantity for the sake of its straw which is used by saddlers.

71. Indian Corn is grown here only as a garden vegetable. Sweet Corn is the variety mostly used. A large kind, called Fodder Corn, is grown and cut as fodder for cattle in midsummer. Indian Corn *(Zea Maize)* is a native of India. Our climate is too cold for its profitable culture.

72. Timothy is the principal fodder grass-grown on this Island. It is a perennial exotic. As it does not come to perfection till the second year, it is sown with grain in connection with red clover. It lasts in the soil four or five years, when it usually gives place to the more hardy native grasses. It is more productive

than any of our native grasses, except the Tall Fescue, yielding from one to three tons per acre. Orchard and Vernal Grasses thrive well, but are not much grown.

CLASS III.—GYMNOGENS.

CONIFERÆ.—*Cone-Bearers.*

73. This family contains our most important forest trees, useful alike to the farmer and the artisan. Their perennial foliage spreads heavy shadows all over our land, green amid the snows of winter as in the sunshine of summer. The White Pine *(Pinus strobus)* is the grandest, towering eighty to a hundred feet in height, and spreading its tasseled arms above the summit of the deciduous forest. Its long, slender leaves grow five in a bundle; cones long and pendulous. This tree affords the most valuable pine lumber, used for house-finishing, in cabinet-work, and wherever fine work is required.

Red Pine *(Pinus rigida)* is a smaller tree with large, ovate cones and leaves in twos. It is not common. A considerable grove grows on the banks of Mill River.

The Spruce *(Abies nigra)* is a large, heavy-foliaged tree of lofty conical form. Leaves quadrangular, erect. Cones ovate, and drooping. Its timber is used for rough-boards and shingles, in ship-building and for spars of vessels.

74. The Fir *(Abies balsamea)* is an elegant, tapering tree, with symmetrically divided branches. It grows on

drier soils. Leaves flat. Cones erect, cylindrical, bluish. Fir timber is soft and light. It is used for fencing and for frames of buildings. Canada balsam, used in microscopy and other arts, is the produce of this tree.

Hemlock *(Abies Canadensis)* is a large tree with small, flat, denticulate leaves and small cones pendulous from the extremities of the branches. Its great, rounded dome of foliage has a soft and delicate appearance. Hemlock timber is valuable for bridge and wharf building and is used for rough-boards. The bark of the Hemlock is that which is used in this country for tanning leather.

The Larch *(Larix microcarpa)* grows in swamps. It is a medium-sized tree with long branches, sparsely clothed with little bundles of small, light-colored needles which are deciduous. The timber is very durable. It is used for railway ties, fence posts, and knees for vessels.

75. White Cedar *(Cupressus thuyoides)* is a large, rough tree with minute leaves appressed to the branchlets, like scales. It grows in the peat swamps of Prince County. Cedar is the most durable native timber. It is used for fence and telegraph posts, sills of buildings, and shingles.

Yew and Juniper are prostrate shrubs with the general appearance of conifers. Instead of cones, however, the first bears red, and the last blue, berries. *Juniperis prostrata* is a creeping shrub which sometimes covers, with a dense mat of foliage, the summits of exposed sea-cliffs.

CLASS IV.—CRYPTOGAMS.

FILICES.—*Ferns.*

76. Sixteen species of these graceful plants adorn our summer wood-lands. They are delicate plants, nearly all of them withering with the first breath of autumn frost. The Brake *(Peris aquilina)* is the most common. It flourishes on all wild land, but attains its greatest size in the openings of heavy timber. It is easily recognized by its tripartite frond, which bears the seeds in a continuous marginal line on the back of the leaflets.

77. The *Osmundæ*, or Flowering Ferns, are the largest and most beautiful. They grow in plume-like clusters of pinnate or bi-pinnate fronds, sometimes five feet high. The seeds are produced on a separate frond in *O. cinamomea;* on modified divisions of the frond in *O. Claytonia;* but on the summit of the frond of *O. regalis.*

78. The Dixonia clothes the cradle-hills of dry, woody districts with its light-green, finely-divided and fragrant fronds. Much resembling it in appearance is the Shield Fern *(Aspidium spinulosum)*, which alone preserves its fronds green through the winter's frosts.

The Sensitive Fern, with seeds on a separate frond, grows plentifully about the borders of ponds; and the delicate Spleenwortses flourish in dry or wet woods.

LYCOPODACEÆ.—*Club-Mosses.*

79. These are evergreen plants, covered thickly

with small, lanceolate, one-veined leaves. They bear their fine, dust-like seeds, called spores, on erect spikes. They grow abundantly in all our wood-lands, and are used to ornament dwellings at Christmas festivals. We have five species.

EQUISITACEÆ.—*Horse-Tails.*

80. Horse-Tails are small plants growing in damp fields and swamps. The fertile stems are usually without leaves, simple, hollow, ribbed, and sheathed, bearing a spike of fruit on the summit. The sterile stems have whorls of long, narrow, divided leaves. *Equisitum hyemale* grows three feet high without leaves. Its sheaths are white, with black at the base and summit. This plant has a deposit of silica, or flint, in its cuticle, which makes it rough and harsh. It is used for polishing steel and other hard substances.

MUSCI.—*Mosses.*

Moss.

81. Beautiful forms of these minute plants everywhere carpet our wood-lands and cover up decaying trees and stumps. Urn-Mosses are upright little plants with urns, or capsules, containing their seeds, erected on foot-stalks. They clothe the cradle-hills in stump lands with a dry vegetation before the grasses get a foot-hold. *Feather Mosses* are more delicate prostrate plants spreading their feather-like leaves over the ground in damp, woody shades. *Sphagnum stellare* is a large moss with its pointed leaves

arranged in a thick, star-like whorl round the summit of the stem. It grows in wet bogs.

Lichens.

82. Lichens grow with a broad, irregular thallus, or frond, bearing shields which contain the spore cases. They are very numerous, and of various colors, on trunks of trees, some species clasping the surface closely, others growing in loose, olive or green festoons.

Fungi, or Mushrooms.

Mushrooms.

83. To this extensive family belong the *moulds* which flourish in damp places, and the *rusts* and *smuts* which affect our crops. Numberless *Mushrooms* grow in every damp situation. Most of them are poisonous. Only the Edible-Mushroom *(Agaricus campestris)* is certainly known to be innoxious. These plants consist of the *kileus*, or cap, the *lamellæ*, or thin, radiating plates under the cap, the *stipe*, or stalk, and the *mycelium*, or fine, ramifying roots. The lamellæ bear the spores.

Algæ, or Seaweeds.

84. Large numbers of these low-typed plants darken the waters of our coasts and are cast ashore by every

tide. The common, grass-like Seaweed of the harbors is not an Algæ but a flowering plant *(Zostera marina).* The great, broad Kelp-Weeds are common in deep water, growing ten to twenty feet in length. There are two species, *Laminaria longicruris* and *L. caperata.* Dulse *(Rhodymenia palmata)* and Irish Moss *(Chondrus crispus)* are both abundant on our coasts. They are both beautiful little purple, cartilaginous plants a few inches in length. Irish Moss is the more contracted into a stem below, and has the leaves more divided and moss-like. *Fucus*, or Rock-Weed, grows on every shore, covering the half-tide rocks with a thick mat of dark olive vegetation. It is easily recognized by its branched form and turgid air-bladders and receptacles. There are three species, *F. vesiculosus*, *F. serratus* and *F. furcatus. Chordæ fili* are those brown, cord-like weeds ten or twelve feet in length growing in clusters on stones, in deep water.

GLOSSARY.

A, in composition, signifies wanting, or without: as ***acaulis,*** without a stem.

Acrogens. Plants increasing by growth on the extremity only.

Ament. The inflorescence of certain trees, as the willow, birch, etc.

Annual. Living but one year.

Anther. The upper part of the stamen which contains the pollen.

Bacca. A berry.

Berry. A succulent fruit containing a number of seeds in its substance.

Biennial. Living two years, in the second of which the fruit is produced.

Bi-pinnate. Twice pinnate.

Bracts. Leafy appendages to the flowers.

Cæspitose. Forming little tufts or clusters.

Calyx. The exterior envelope of a flower.

Campanulate. Bell-shaped.

Capitum. A globular head of sessile flowers.

Capsule. A dry, woody seed vessel.

Catkin. An ament.

Corolla. The delicate, colored part of a flower.
Culm. The stem of grasses.
Cyme. A mode of inflorescence in which the flower-stalks rise from the same point, but are afterwards variously subdivided, as seen in *Scirpus lacustris.*
Decumbent. Lying down.
Deltoid Shaped like the Greek delta.
Deciduous. Falling. A term used to designate those plants which shed their leaves every autumn, and are thus distinguished from evergreens.
Cordate. Heart-shaped.
Corona. The whole head of a forest tree, formed by the mass of branches and leaves.
Dentate. Toothed on the margin.
Dicotyledonous. Having two cotyledons.
Drupe. A succulent fruit containing a bony nut in the centre.
Flora. The assemblage of plants found in a country.
Frond. The leaf of cryptogamous plants.
Glume. The calyx of grasses and grains.
Gymnospermous. Having naked seeds.
Herbaceous. Not woody.
Infundibuliform. Shaped like a funnel.
Involucre. The calyx remote from the flower.
Labiate. Corolla with two lips.
Laciniated. Cut into many irregular divisions.
Lanceolate. Spear-shaped.
Legume. The pod of the pea and bean.
Linear. Long and very narrow, like the leaves of grasses.
Lobes. The divisions of sinuate leaves.
Lyrate. Shaped like a lyre.
Monocotyledonous. Having but one cotyledon.
Monopetalous. Having only one petal.
Nerved. Having small longitudinal ribs.
Nut. A seed enclosed in a hard shell.
Obcordate. Cordate reversed.
Oblong. Much longer than broad with the sides nearly parallel.
Obovate. Ovate reversed.
Octandrous. Having eight stamens.
Opposite. Standing directly against each other on opposite sides of the stem, as in Fig. 12.
Ovate. Egg-shaped.
Palmate. Hand-shaped. Deeply divided into spreading segments.
Panicle. A loose cluster in which each pedicle bears several flowers.
Papilionaceous. Butterfly - shaped corolla.
Peduncle. The flower-stalk which springs from a stem or branch.
Pendulous. Hanging down.
Perennial. Living more than two years.
Petals. The divisions of the corolla.
Petiole. The stalk of a leaf.
Perianth. This is the calyx when contiguous to the petals.
Pericarp. A seed vessel.
Petiolate. Having petioles or leaf stalks.
Pinnate. A leaf is pinnate when a single petiole bears a row of leaflets on each side.
Pinnatifid. Cut in a pinnate manner.
Pistal. One part of the reproductive organs of plants. It consists of the germ, style, and stigma, and is usually surrounded by the stamens.
Polypetalous. Having more than one petal.
Pome. An apple.
Procumbent. Lying down.
Prostrate. Lying flat on the ground.
Quinate. Five together.
Raceme. A cluster. See Fig. 20.
Radical. Proceeding from the root.
Receptacle. The expanded end of the flower stalk to which the other parts of the flower are attached.
Ringent. An irregular corolla with an upper and an under lip.
Rotate. Wheel-shaped.
Runcinate. Having large teeth pointed backwards.
Rugose. Rough, wrinkled.
Saggitate. Shaped liked an arrow-head.
Sepals. The divisions of the calyx.
Serrate. Notched like the teeth of a saw, the points inclined outwards.
Serrulate. Minutely serrate.
Sessile. Having no foot-stalk.
Sinus. A deep, large notch cut out of a leaf.

Sinuate. Notched with sinuses.
Silique. A long seed vessel of two valves.
Spathe. A sheathing calyx opening lengthwise on one side, and enclosing a spadix.
Spike. A dense, erect cluster of sessile flowers.
Spur. A sharp projection from the corolla of a flower, usually the nectary.
Stamens. One set of the organs of reproduction in plants. They surround the pistal, or pistals, and consist of a stalk, called the *filament,* and the *anther* on its summit, which contains the *pollen.*
Stellate. When leaves grow in whorls around the stem.
Stigma. The summit of the pistal.
Stipe. The stem of mushrooms.
Stipules. Leafy appendages to the leaves.
Strobile. A cone.
Ternate. When three leaves are on a single foot-stalk.
Thalogens. Plants consisting of a leaf-like expansion called a thalus.
Trailing. Creeping along the ground.
Triquinate. Three fives.
Turbinate. Shaped like a top or pear.
Umbel. A kind of inflorescence in which the flower stalks diverge from one centre.
Veined. When the veins form an irregular network on the leaf.
Verticillate. Whorled. Leaves or flowers in circles round the stem.

Zoology.

Zoology is that department of natural history which treats of animals.

The Fauna* of Prince Edward Island is numerous and varied. A few larger animals, as the Moose, the Caribou, the Wolf, the Raccoon, and the Wolverine, which roam over the continental lands, are excluded from the Island by its insular position. But this is much more than compensated by the numerous marine animals which inhabit our coasts, and which afford some of the most interesting studies of animal life.

Animals are naturally arranged in the following Divisions:

1. Protozoa.—Simplest forms of animals without regular structure.

2. Cœlentera.—Hollow-bodied animals: Corals, Sea-Jellies, &c.

3. Echinodermata.—Spiney-skinned animals: Sea-Urchins, &c.

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* The assemblage of animals found in any country.

4. MOLLUSCA.—Soft-bodied animals: Snails, Bivalves, &c.

5. ANNULATA.—Animals composed of ring-like segments: Worms, &c.

6. ARTHROPODA.—Animals with jointed feet: Insects, Spiders, &c.

7. VERTEBRATA.—Animals with a vertebrate skeleton: Mammals, Birds, Reptiles, &c.

DIVISION I.—PROTOZOA.

The greater number of these are minute animals, requiring a microscope for their study. Many of them inhabit the slime of ponds and decaying vegetation; and some, as *Bacteria* and *Microbes*, are the origin of decay and of disease in animals. Vast multitudes fill the waters of the sea. One interesting genus, *Noctiluca*, is abundant on our coasts, and produces those aurora-like flashes of light which appear at night when the waters are disturbed by the passage of a boat.

Small Sponges are common on our shores. Some of them are shapeless masses an inch or two in diameter, resembling pieces of water-soaked bread, and are called *Halicondria*. The beautiful Cup Sponge *(Isodictya)* is often seen cast on the sands in a broken condition. When perfect, it is the size and shape of a drinking goblet. Sponges of the genus *Cliona* burrow into the substance of dead shells.

DIVISION II.—CŒLENTERA.

The Hydroid Polyps of our coasts are small Polyps with horny coverings, or cells. They are seen attached in great numbers to sea-weeds and submerged timber. *Tubularia* have simple, horny tubes. *Sertularia* are in the form of minute wreaths, *Campanularia* are branched, with cups along the branches which bear the flower-like polyps.

JELLY-FISHES are soft-bodied animals with clear gelatinous disks, abundant on all our coasts. Our large purple Jelly-Fish is *Cyanea arctica.* Its disk is generally a foot or more in diameter, but specimens have been observed seven feet in diameter. The great purple disk of this creature, as it goes pulsating through the waters and trailing its long red tentacles after it, is a conspicuous object of our sea coast. Its tentacles are stinging, and benumb small animals which they touch, thus making them the easy prey of the Cyanea. Underneath the centre of the disk is the mouth surrounded by fringes. Eight eyes and eight ear vesicles are on the margin of the disk.

The common white, or colorless, Jelly-Fish of our coasts is *Aurelia flavidula.* Its ovaries form four white clusters on its under part.

SEA-ANEMONES are gelatinous animals found adhering to submerged timber or rocks. When expanded, they exhibit a large number of red or purple tentacles, and resemble a brilliant flower. The beautiful *Metridium marginatum* is our common species.

PLEUROBRANCHIÆ are little, transparent, gelatinous balls, less than an inch in diameter, that, by the aid of their zones of locomotive fringes, go coursing through the waves of our summer seas. Two long, plumed tentacles stream after them, delicate as if woven of translucent glass. These tentacles are capable of rapid expansion and contraction. At one moment they are rolled up to the animal's body in a mass no bigger than a pin's head, the next instant they are streaming half a yard behind it, with expanded fringes, like the beard of a glassy feather.

DIVISION III.—ECHINODERMATA.

The STAR-FISH *(Asterias vulgaris)* is very common on mussel beds. It is shaped like a five-rayed, purple star, covered with spines on its upper surface and bearing great numbers of retractile feet on its lower surface. The mouth is in the centre below, and a single eye is at the extremity of each ray. The animal is very voracious, and will even abstract the Oyster from its strong bi-valve shell.

The SEA-URCHIN *(Echinus Drobachiensis)* is common on our shores. It is of a globular form and covered with hard spines. Among the spines are a number of retractile feet, by means of which it crawls about the sea bottom. The dead shells are often found drifted on the beach. They are then divested of their spines and are very beautiful little objects, marked

with radiating lines of tubercles to which the spines had been attached.

The CAKE-URCHIN has a flat shell.

SEA ORANGES are animals of this division, of a bright red color, found in the deep waters of the gulf.

DIVISION IV.—MOLLUSCA.

The Mollusca are soft-bodied animals. Many of them however are protected by a hard shell, or *test*, whence these are called *Testacia*. More than eighty species of Mollusca are found in our waters and damp wood-lands.

Of the low order, BRACHIOPODA, we have the *Rhynconella* and the *Terebratella* inhabiting the abysses of the Gulf.

If we examine the common shells of the shore, we will observe that some of them, as the Oyster and Sand-Clam, consist of two parts or valves, united by a hinge, while others, as the Natica and the Periwinkles, have only one shell. This difference in the shells marks two very distinct classes of animals—the *Lamellibranchiata* and the *Gasteropoda*. The Lamellibranchiate, or Bivalve animals are without heads, have their gills in broad lamellæ round the body, and have little, often no powers of locomotion. The Gasteropods, or Univalves, have a distinct head, the gills in a plume-like tuft, and a large, muscular foot by which the animal moves from one place to another.

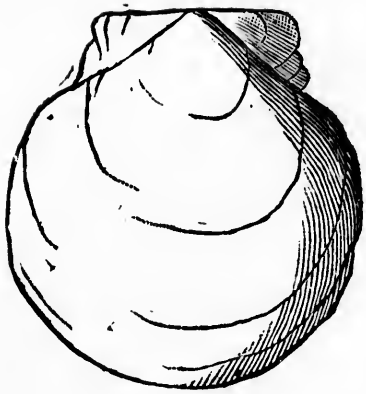

Fig. 1. Bivalve.

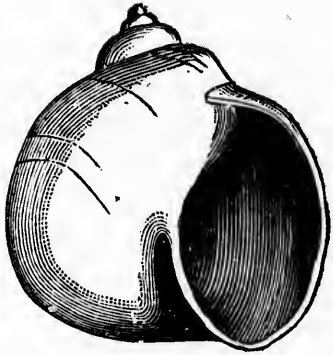

Fig. 2. Univalve.

LAMELLIBRANCHIATA.

The TEREDO is a curious genus of Mollusca which drills into submerged timber. It has on its anterior part a pair of sharp valves by means of which it cuts into the solid wood. It lines its excavation with a thin shelly tube. The bottoms of vessels are perforated by these animals and the timber completely destroyed. It is as a protection against their ravages that vessels are sheathed with copper. Two species inhabit our waters—*T. navalis* and *T. Norvigica.*

The SAND CLAM *(Mya arenaria)* is found in great numbers in the sands of all our rivers and bays. It is provided with two strong, muscular syphons, by one of which water is drawn in and by the other expelled. It is expelled with great force, when the animal is suddenly disturbed, and thrown in a jet from the sand. The clams are used in large quantities for fish bait.

Mya truncata has a shorter shell. *Thracia Conradi* somewhat resembles a Sand Clam and is a beautiful white shell.

The RAZOR-FISH *(Solen Americana)* has a beautiful glossy, horn-colored shell of a much-elongated form and gaping at both extremities. It burrows in the sand at low-water mark.

PETRICOLA *(P. pholadaformis)* is a pure white shell of oblong form, elegantly wrinkled at its anterior end. It burrows into sandstone reefs and drift fragments of limestone rock. The TELLINA *(T. Groenlandica)* is a delicate, white, little shell, with circular and compressed valves. It inhabits the mouths of creeks and runs. The QUAHAUG *(Venus mercenaria)* buries its strong, subglobular shell in great numbers in the muddy bottoms of our river estuaries. CYTHERIA is a very similar but smaller shell.

The MACTRA *(M. solidisima)* somewhat resembles the Quahaug but it is a larger shell, longer, flatter, s moother, nd in a fresh condition, bears some yellowish epidermis. It is the shell of the sea coast, burrowing in the sand reefs and leaving its great white valves to be ground up along the rocky cliffs. The BANK CLAM *(Cyrtodaria siliqua)*, with a dark epidermis, inhabits the fishing banks of the Gulf, and is a favourite food of the cod.

The minute *Cardium Pinulatum* is our only common COCKLE. *Cardium islandicum* is found in the deep waters of the Gulf.

UNIOS are fresh-water bivalves inhabiting streams.

They have oblong shells two inches and a half in length, covered externally with a dark epidermis and pearly inside. They are not common on the Island, but *U. complanatus* is found in the St. Peter and Morell Rivers.

The common MUSSEL *(Mytilus edulis)*, with its dark, ovate shell, is abundant on every shore, where it attaches itself to the rocks by its fibrous byssus. The Horse Mussel *(M. modiolus)* is a larger species, found on the sea coast. The beautiful *Modiola plicatula* has a more elongated shell marked by radiating striæ. It inhabits salt marshes and runs. In Britain, Mussels are extensively used as food.

Shells of ASTRATE are common, drifted on the shores, and several species of YOLDIA are found in the deep waters of the Gulf.

The PECTEN (Fig. 1) has a large, strong, and somewhat circular shell, marked by regular radiating ridges running from the beak to the circumference. It has two ears which widen the hinge surface, and a single adductor muscle. *P. tenuistriatus* is common all around our coasts.

The OYSTER is the most valuable of all Moluscous animals. It is consumed in great numbers by the inhabitadts of both the Old World and the New. It is very abundant on the coast of the United States, but does not extend further north than the Southern Basin of the Gulf of St. Lawrence. It is plentiful in all our bays and tidal rivers. The Oyster has two stout, rough shells, united by a hinge and held firmly closed by a single strong muscle, called the *adductor muscle.* In

order to open an Oyster we must sever this muscle. We then find the animal enclosed in a pellucid membrane, called the *mantle.* Four rows of *gills*, like silky fringes, form a semicircle within the edge of the mantle. Close behind the adductor muscle is the *heart*, a little, ribbed purse, seen to pulsate even when the shell has been opened. A mouth with tentacles, and large intestines are seen. An Oyster will produce 1,200,000 eggs. These are hatched within the parent shell. The young animals, called *spat*, immediately adhere to some firm surface, as stones or shells. They grow very rapidly. In three months they are as large as a quarter-dollar; and in a year and a half are fit for use.

We have two varieties of the Oyster. The Northern Oyster, which has a short, stout shell, and the Virginian Oyster, which has a long, narrow shell, and frequents muddy situations about the heads of rivers.

Pteropods are small, free-swimming Moullusca inhabiting the deep waters of the sea. The delicate, glassy shells of *Hyalina* are sometimes cast on our shores.

The Doris, or Sea Lemon, is a naked mollusk inhabiting rocky shores. It looks like a flesh-colored gelatinous mass an inch in length.

GASTEROPODA.

The Slipper Limpet *(Crepidula)* is abundant on oyster beds. It has a convex shell with a shelf across one end of the inside.

The little, dark-shelled Periwinkles are seen in

great numbers crawling about the sea-beaches and feeding on sea-weeds. Four distinct species are all common.

VELUTINA is a strongly-built little globular shell of a bright yellow or red color, common on our shores.

The largest univalve of our shores is the white, globular NATICA *(N. heros)*, (Fig. 2). On the sea coast the shells are much larger than in the rivers. The animal is carnivorous, preying on other shell-fish. It has a very large foot by means of which it buries itself in the sand. The shell is closed with a spiral, horny operculum. A beautiful little species, *N. triseriata*, with three rows of brown spots on its shell, is common, and may be seen crawling about in pools left by the tide.

ROCK SHELLS *(Purpuria lapillus)* are abundant on rocky shores, adhering to the low-tide skerries. They have strong, rugose, white or yellowish, spiral shells, the apertures of which are notched for the siphon. This siphonal notch is also observed in the two following species. The eggs of Rock Shells are deposited in leathery cases and fastened to the rocks which they frequent.

Nassa obsoleta is a dark brown, spiral shell very common on flat, muddy shores. *Nassa trivittata* is a smaller and more elegant, flesh-colored shell living below low-water mark.

UROSALPINX is a beautiful, rugged, white, spiral shell, much larger than a Rock Shell. It is sometimes found on mussel beds.

Along the sand-beach, left by the tide-wash, we often find numerous collections of many species of tiny shells. The young of sand clams sometimes form a large part of the mass, but the valves of *Gemma*, the shells of *Rissoa*, *Turbonella*, *Columbella*, *Utriculus*, *Odostomia*, *Bittium*, and *Lacuna* are all in numbers.

We all know the common yellow GARDEN SNAIL that carries its house on its back. But we are not all so well aware that five other species of Snails, all carrying spiral shells, inhabit our woods and fields. They are all of small size, living under leaves, stones, and logs. SUCINNEA resembles the snails, but has a wide-mouthed, oval shell with a very small spire. MELAMPUS lives on salt marshes crowding among the stems of the thick marsh grasses.

The dusky, fragile shells of POND SNAILS *(Limnea)* are abundant on the glassy borders of every mill pond. With them we find the shorter spires of *Physa* and the large, whorled shells of *Planorbis*. The delicate, glossy shells of *Vitrina* and *Zua* are abundant on alder bottoms.

CEPHALOPODA.

Our only representative of this class is the SQUID. It occurs in shoals on the fishing grounds, where it is caught for mackerel bait. The Squid is from one to two feet long, of a yellow or livid color, and spotted. It has a large, rhomboidal tail fin, ten strong tentacles with suckers round the head, and two large, prominent eyes.

DIVISION V.—ANNULATA.

This division comprises the Intestinal Worms, Earth-Worms, Leeches, and Sea-Worms.

Of the intestinal parasitic worms one of the most injurious is the TAPE-WORM which produces the disease of measles in the domestic hog. The hog takes the eggs of the tape-worm along with its food. These become developed in its system, and having gone through several changes, establish themselves in a resting or pupa state, when they are termed *Cysticercus*, and are known as measles. These introduced alive into the human stomach would produce another horde of worms in the human system that might cause fatal results.

Trichina spiralis which inhabits the muscles of the hog is a distinct worm, but its mode of life is much the same and it is equally dangerous to human beings.

The great safeguard against these and other parasitic worms is cleanliness in preparing and care in perfectly cooking food.

The common EARTH-WORM is known to all. It feeds on particles of organic matter present in the soil, and swallows much fine earth with its food, which it ejects at the mouth of its burrow. It is of value to the agriculturist in working over the soil, particularly in grass lands. Earth-Worms serve as food to many of our summer song-birds.

The TUBICOLA are sea-worms. They form tubes of various materials from the openings of which they

exsert their gills in graceful and gaily-colored tufts. The delicate little tubes, formed of grains of sand cemented together, which are found so abundantly on our shores, belong to a worm of this order—*Pectinaria annulata.* *Spirorbis* has a small, white spiral shell, found attached to sea-weeds.

The genus *Nereis* consists of long, reddish water-worms with tentacles about their heads and tufts of gills along their sides. The SEA MOUSE is a curious animal of this class, five inches long and more than two broad, covered with respiratory organs and bristles which look like a clothing of hair. All these are found in the mud dredged by diggers on mussel beds.

DIVISION VI.—ARTHROPODA.

This division includes the Crustacea, Myriapoda, Insecta, and Arachnida.

CLASS I.—CRUSTACEA.

The little white ACORN-SHELLS which crowd so abundantly on the tide-washed rocks of every shore are aberrant forms of this class. There are two species. *Balanus crenatus* and *B. porcatus.*

The BARNACLES proper have long, fleshy foot-stalks by which they attach themselves to submerged objects. They adhere in great numbers to the bottoms of vessels.

SAND-HOPPERS *(Talitrus locusta)* are small brown crustaceans an inch or more in length, with a great

number of feet and gill-scales. They are very plentiful on the sands of our shores and among drift sea-weed always hopping with great agility.

The common LOBSTER *(Homarus Americanus)* is abundant round our coasts. It belongs to the Decapodous, or ten-footed division of the crustacea. It swims with great agility by the aid of its large tail fin. Or it crawls along the bottom of the sea, and digs holes among the rocks, where it may hide itself. It is carnivorous in its habits, and is taken by the use of animal bait. In September, young Lobsters appear in great numbers along the shores. They attempt to hide themselves in empty shells and other shelter. When a few weeks old, they are devoured in multitudes by cods and other large fishes. Lobsters frequently change their shells, by casting off the old ones and growing new ones of larger size. During the period of this change they are inert and sickly, and easily become the prey of their enemies. The shell is rarely changed after the animal comes to maturity. In September Lobsters retreat to deep water for the purpose of spawning. They return to the shore in May, the time varying with the locality. Vast numbers of Lobsters are taken in traps for the purpose of canning. Not less than 20,000,000 are annually caught on our coasts. These are cooked in large boilers, at the factories, the meat extracted by hand, and hermetically sealed up in tin cans. The flesh of four lobsters will fill a pound can. The annual value of this fishery is $500,000.

COMMON SHRIMP, PRAWN, and many allied animals

are common about our shores. The HERMIT CRAB, which has naked posterior extremities, may be seen domiciled in the empty shells of Natica.

Our COMMON CRAB is *Cancer borealis.* The SMALL CRAB is *Hyas aranea.* The GREAT CRAB, eighteen inches in diameter, inhabits deep water.

CLASS 2.—MYRIOPODA.

This class includes the CENTIPEDES and their allies, distinguished by their lengthened forms and great number of feet.

CLASS 3.—INSECTA.

This class contains the Insects, which are as numerous as all other members of the animal kingdom taken together. Insects are remarkable for the perfection and energy of their muscular system, for their singular and often beautiful forms, for the complete metamorphosis which many of them undergo, for their wonderful instincts, and for the delicacy and perfection of their structure compared with most Invertebrata.

The body of an insect (Fig. 3) consists of the *Head*, bearing the mouth, eyes and antennæ, or feelers; the *Thorax*, bearing the six legs and two pairs of wings; and the *Abdomen*, containing the digestive and reproductive organs. The nervous system consists of an abdominal cord running the length of the body, having a ganglion, or nerve centre, at each segment, which gives off nerves for that segment. In the head is a considerable nerve

mass giving off the nerves of sense. The senses of taste, smell, touch, sight, and hearing are all possessed by insects. The eyes are very different from those of higher animals. In general, what appears to be a single eye is an aggregation of a multitude of small eyes. The House Fly has 4,000 of these distinct eyes. A species of Beetle has more than 25,000. The *digestive organs* consist of a gullet, crop, gizzard true stomach, and intestines. The *heart* is an elongated vessel in the upper part of the body, furnished with valves for propelling the blood forward. *Respiration* is effected by *tracheæ*, or breathing tubes, which ramify through all parts of the body, and open by spiracles, or breathing holes, in the abdomen and thorax.

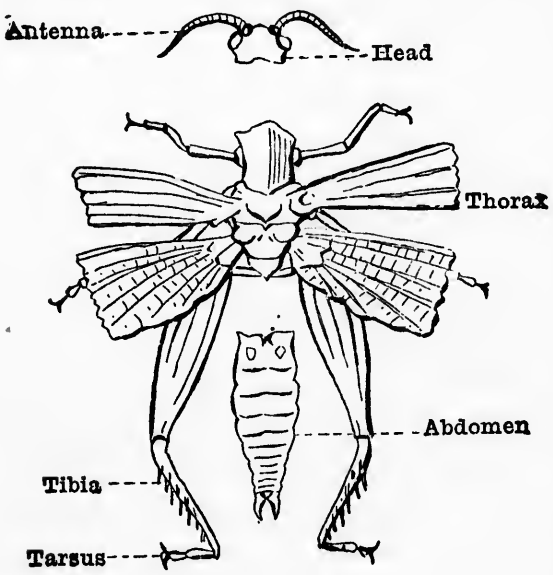

Fig. 3.

Their metamorphosis is one of the most interesting features of insect life. The perfect insects lay eggs which are hatched into larvæ, or grubs, exceedingly unlike the perfect insects. These *larvæ*, after a greater

or less time which has been spent in voraciously devouring food, are changed into *pupæ* which are enclosed in a hard case and remain inactive. After a period the pupæ burst their cases and come forth as perfect insects, or *imagos*.

Insects are divided into nine Orders.

Order 1.—Aptera.

These have no wings and undergo no metamorphosis. They are the Lice and Spring-Tails. Lice are too well known, existing in many different species on men, beasts, and birds. Small black Spring-Tails sometimes appear in great numbers on the snow in winter, particularly under the shade of spruce groves.

Order 2.—Aphaniptera.

These undergo metamorphosis. *Fleas* lay their eggs in dust and dry dirt. They hatch into worm-like larvæ which change into pupæ and then into perfect insects.

Order 3.—Diptera.

These insects have but two wings. Their larvæ are footless maggots. They are the Flies and Gnats.

The Horse-Bot *(Œstris equi)* is an insect less than half an inch in length, woolly, and of a yellowish and rusty color, which is troublesome to horses in the latter part of summer. It fastens its yellow eggs by a glutinous secretion to the hairs of the horse's legs. The horse

removes them, when licking himself, with his tongue, and they are conveyed to his stomach. Here the larvæ are hatched and remain all winter, being known as "bots." In the spring the larvæ pass through the horse. They then bury themselves in the ground, where they are changed into oval, black pupæ, from which, in a few weeks, they come forth as perfect insects. The eggs, or "nits," should be carefully cleaned off the horse's legs so as to prevent the animal taking them into his stomach.

The Ox-Bot deposits the *warbles* in the backs of cattle, and the Sheep-Bot forms the grub or maggot in the head of sheep, which is sometimes fatal to this animal. Warbles should be removed from the backs of cattle and destroyed; and it is proper to smear the nostrils of sheep with tar, in June and July, so as to prevent the flies depositing their eggs in them.

The common House-Fly belongs to this order, as do also a vast number of related flies, whose larvæ form an endless tribe of maggots and hoppers.

The Wheat-Midge *(Cecidomyia tritici)* deposits its eggs in the blossoms of Wheat on calm evenings the last weeks of July. This fly is a delicate little insect, with orange-colored body and plumose antennæ. Its eggs are soon hatched into minute, yellow larvæ, which feed on the juices of the young grain and destroy its growth. When the larvæ, called "weevils," are fully grown, they descend into the ground, where they remain all winter, to come out the next season a new horde of perfect insects.

The whole wheat crop of the country has frequently been ruined by the ravages of this minute insect. As a remedy against the "weevil," wheat is sown the last of April or the first of May so that it will be past the period of bloom before the midge appears. Or the sowing is deferred till the first of June, which makes the period of blooming later than the appearance of the midge. The HESSIAN FLY attacks the stalk of the wheat. It is little known here. An allied species attacks timothy.

The larvæ of the Mosquito inhabits ponds, where it may be seen in great numbers, in warm June days, actively wriggling through the water and coming at intervals to the surface to breathe through its posterior air tube. When the period of transformation comes on, it partly ascends a stalk of grass, splits its larval skin, leaving its old shell to float on the surface of the pond, and mounts on gauzy wings into the summer air. The whole period of transformation occupies only three or four weeks, and, as the females lay several hundred eggs, great swarms are soon produced. They are always more troublesome in wet or swampy districts than in a dry country.

Order 4.—LEPIDOPTERA.

These insects have four wings, usually of large size, clothed with colored scales. They are the Moths and Butterflies.

Many beautiful butterflies enliven our summer fields. Before the snows are well gone, a bright, sunny

day in April will bring out the ANTIOPA BUTTERFLY, with rich brown wings, edged with blue and gold. The first weeks of June, the white CABBAGE BUTTERFLY flits through the garden walks in search of beds of young cabbage plants. A week later the yellow PHILODICE BUTTERFLY sports abroad on the meadows. Then comes the beautiful APHRODITE BUTTERFLY with brilliant tawny wings, spotted with brown, and bearing silver spangles on the under sides. The THISTLE and HUNTER BUTTERFLIES are tawny with some reddish spots. In the first days of July comes the great yellow and black SWALLOW-TAIL BUTTERFLY *(Papilio turnus)* floating through the leafy glades. Then, when the hay fields are ripe, the dusky-colored HIPPARCHIA BUTTERFLIES will appear in numbers all over the fields. The NYMPHALIS is a showy, midsummer species, with white bands on its blue-black wings. The COPPER SKIPPER is a beautiful little variety, of a brilliant copper color, that may be seen, in July, rapidly flitting from spray to spray in the blooming meadows. The BORDERED SKIPPER has dark borders on its tawny wings, and stays amid our grass fields till the chill days of October.

Moths are distinguished from Butterflies by the possession of plumose antennæ, and by resting with their wings in a horizontal position.

HAWK MOTHS are large, stout-bodied moths with often narrow wings. The larvæ of one of the largest species feeds on the potato plant.

The dun-colored TIGER MOTHS come in abundance into our houses on summer evenings. *Arctio virgo* is a

beautifully-colored moth. The largest moths are the fawn-colored EMPEROR MOTHS. They are silk-worm moths, and their large silky cocoons may be found hung in our hedges and wood-borders. *Attica luna* is a large swallow-tailed moth of a delicate green color.

The TENT CATERPILLAR has large, dark-colored larvæ which go in swarms and are very destructive to orchards. The FALL WEB-WORM appears in July and August, weaving a silky web for its protection on the limbs of apple trees. The caterpillar is much smaller than the Tent Caterpillar, and hairy. It destroys the foliage of the trees, and, like the Tent Caterpillar, should be destroyed at its first appearance.

The CODDLING MOTH lays its eggs in the apple blossoms, and produces the grub which injures the fruit, causing it to fall prematurely. The best remedy against this insect is to cook or feed to hogs all fallen apples.

Order 5.—HYMENOPTERA.

The HUMBLE BEE is our wild honey bee. Early in May the solitary queen is heard buzzing through the air. She soon selects a site and excavates a nest under stones, stumps, or animal droppings. This she stores with pollen and in it lays her eggs. Now her feeding ground is among the early bloom of the willows and maples. In three weeks the first workers are out, and the regular labors of the hive begin. Now the workers range the blooming fields, bearing home pollen and honey for the young. In autumn, a warm apartment,

lined with grass, is provided for the young queen where she passes the winter, the sole survivor of the colony.

CARPENTER BEES excavate their cells in dead wood. UPHOLSTERER BEES line their excavations with fragments of leaves, which they clip from the smooth foliage of the rose. MASON BEES build their cells of mud, fastening them in chinks of buildings and trees. BURROWING BEES dig into the soil and rear their young there.

It is the HORNET *(Vespa maculata)* which builds the large paper nests, that we find hung in trees and shrubs, composed of pulp from macerated woody fibre. Several smaller species of wasps build smaller nests in brush, or under the soil. Wasps feed on insects, flesh, and fruit, and rear their young on the juices of these.

ANTS are abundant with us. Large Black Ants excavate their galleries in the trunks of spruce and fir trees. Smaller Black and Red Ants raise their hills in pastures and borders. Yellow Ants make their nests under stones. Three kinds of ants live in every community, viz. males, females, and neuters. Male and female ants are winged insects. The little wingless insects which we see running about, so busily exploring every cranny, are the workers, engaged in collecting provisions for the colony.

SAW-FLIES wound the leaves and twigs of trees with their cutting ovipositers when depositing their eggs. One species wounds the young twigs of the sugar maple and produces that beautiful curl in the grain of the timber known as "bird's eye." HORN-TAILS deposit

their eggs in the trunks of pine and spruce trees, and their larvæ are very destructive to the timber.

ICHNEUMONS, or Cuckoo Flies, deposit their eggs in the bodies of the larvæ of other insects, and by this means keep the numerous hosts in check. They are abundant with us.

Order 6.—HEMIPTERA.

The WATER BUGS belong to this order. Their hind legs are fringed with bristles, which adapts them for swimming. The Gerris, or Water-Skater, is seen abundantly in August, skating and whirling on its long legs over the calm surface of pools.

Millions of Aphides, or PLANT-LICE, infest the tender shoots of plants in summer. They are tiny, greenish insects which multiply with extraordinary rapidity. One individual may produce in three months ten thousand million millions.

The APPLE SCALE LOUSE infests the limbs of apple trees. The brown scales contain the eggs which are hatched in July, when the lice ascend the tender twigs and suck their juices.

The CICADA, or Seventeen-Year Locust, is common in August, when its loud stridulation, or song, may be heard ringing from fence and tree top.

Order 7.—NEUROPTERA.

The first of July, the great DRAGON-FLIES (*Æschna heros*), vulgarly called "Devil's darning needles," hawk

through the woody glades after their insect prey. Smaller species are common about swamps and marshes.

Order 8.—Orthoptera.

The Red-Legged Locust is common in our grass fields at haying time. Yellow-striped Locusts may also be seen. The small, green Meadow Grasshopper is abundant. The Great Green Grasshopper is common, as is also the Sulphur-Winged Locust which goes cracking along the dusty roads in the hottest mid-summer days. The little black Crickets live in holes and trill the sunny air of the harvest fields with the music of their tiny harps.

Order 9.—Coleoptera.

These have four wings, the first pair being hard covers for the under pair, which are membraneous and folded transversely.

Lady-Birds *(Coccinella)* are red beetles with black spots, occurring in great numbers in the harvest fields. They are useful insects as they feed upon plant-lice.

The Turnip Fly is a little black beetle which feeds upon young turnip plants, and often does great injury to the crop.

The Potato Beetle *(Doryphera decemlineata)* feeds upon the potato plant, and where abundant completely destroys the crop. It is a brown beetle, with ten black stripes on its yellow wing-covers. Length, less than

half an inch. It originated in Colorado where it fed on a species of wild potato plant. In 1855 it left its native territory, and in twenty years afterwards had infested the whole continent to the Atlantic sea-board. The insects winter in the ground and come out in May, producing three generations in a season. Each female lays 500 eggs, and will produce 22,000,000 descendants in a season. Wherever the beetle makes its appearance it should be instantly exterminated before it multiplies. We have a number of beetles related to the Potato Beetle, but they are innocent little insects, remarkable only for their brilliant coloring.

The CAPRICORN, or Long-Horn Beetles, have antennæ much longer than their bodies. Some of them are very destructive to timber trees. *Saperda candida* is the Apple-Tree Borer. FIRE-FLIES are dun-colored beetles which have the power of emitting light at night. They are quite common and make the [illegible] groves flash with their glancing lamps on damp summer evenings.

The JUNE BUG *(Lachnosterna fusca)* is a large brown beetle which flies after dark on June evenings. Its larva is a large, white grub, which lives under ground and is destructive to crops. Among the earliest insects to appear in the spring are the red and brown Dung Beetles. They feed upon the excrements of animals, where they may be found in great abundance.

Various WATER BEETLES inhabit the ponds of our country feeding upon the larvæ of other insects.

The green and purple GROUND BEETLES *(Carabidæ)* are beautiful, active insects, found under stones and

leaves, and among grass. They feed on other insects and are constantly prowling about for their prey. TIGER BEETLES *(Cicindelidæ)* are light, greenish grey beetles, with bright metallic spots, seen running about sandy roads with great swiftness in search of insects on which they feed.

CLASS 4.—ARACHNIDA.

This class includes the Mites, Ticks, and Spiders. They are all destitute of wings, and have four pairs of legs.

Flour, Cheese, and Sugar Mites are minute but destructive insects.

Great numbers of SPIDERS inhabit our fields and groves or hang their dusky webs in our habitations. Those beautifully-constructed circular webs, with threads radiating from the centre, which we see hung between tall plants or fence stakes, are formed by the GEOMETRIC SPIDER *(Epeira vulgaris)*. The long-legged HOUSE SPIDER weaves a web of close texture and hangs it in neglected corners. On a bright dewy morning in late summer we may observe the grass fields completely overspread with fine filmy webs too delicate to be seen only when covered with dew drops. These are the webs of the little GOSSAMER SPIDERS. Some spiders do not weave any webs. Among these are the WANDERING SPIDERS whose scale-like tents for the protection of their young we find adhering to stones. The LEAPING SPIDER constructs a silken nest for itself under stones.

DIVISION VII.—VERTEBRATA.

The division Vertebrata is composed of the following classes :—FISHES, AMPHIBIANS, REPTILES, BIRDS, MAMMALS.

CLASS 1.—FISHES.

Prince Edward Island has long been famous for the abundance and fine quality of its fish. Shoals of deep sea fishes return to the Gulf with each summer season, making our north shore one of the most valuable fishing grounds in America, while many of our rivers still afford abundant sport for the angler.

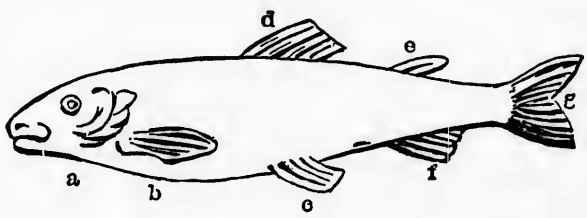

Fig. 4.—Salmon.

a, Gill Cover ; *b*, Pectoral Fin ; *c*, Ventral Fin ; *d*, First Dorsal Fin ; *e*, Second Dorsal Fin ; *f*, Anal Fin ; *g*, Caudal Fin.

Fishes are adapted for aquatic life and breathe by gills situated on the sides of the head. The heart has only two cavities. The brain is smaller than that of other vertebrates, and they have fins for limbs. The two pectoral and two ventral fins represent the four limbs of quadrupeds.

Our fishes may be arranged in the two following orders.

Order 1.—Teleostei.

This order includes the ordinary fishes with a bony skeleton.

Eels are abundant in our rivers and ponds. They frequent springs and runs and are speared on the weedy flats of the rivers when the tide is low. In winter, Eels retreat to deep sea water, from whence also the young come in great numbers in the spring.

Clupeidæ, or Herrings.

The *Herring* comes in great shoals to the coasts of the Island the last week of April, and remains all summer. It is caught in nets and sold fresh or salted in barrels. It is one of our most valuable fishes, more than 40,000 barrels being annually caught. The greater part, however, is used for bait in mackerel and cod fishing. The *Brit* is a small fish which affords food for the mackerel.

A few *Shad* are found on our coasts, and great numbers of *Gaspereaux* crowd, at spawning time, into the narrow runs at the outlets of ponds and streams.

Salmonidæ, or Salmons.

The *Salmon* is the finest fish for the table found in Canadian waters. A few come round our coasts where they are taken in the traps and nets set for other fish.

Salmon ascend the Dunk, Winter, Morell, and other rivers for the purpose of spawning, which takes place in October. When the Salmon spawns, it makes a furrow in the sand with its snout. In this it deposits its eggs and then covers them up. The young fry descend to the sea before winter. Salmon caught here average about ten pounds each, and sell for fifteen cents per pound.

Speckled Trout are plentiful in all our streams and ponds, and afford abundant sport for juvenile fishermen and tourists. 71,000 pounds are annually caught. Trout spawn in October and November, and should then be left quietly alone to enjoy their domestic arrangements.

Smelt.—This delicious little fish comes in multitudes, in early spring, to spawn in the head waters of our streams. It is then readily taken with the scoop net. The rest of the year it lives in the rivers and bays and is taken with hook and line.

Caplin is a small fish resembling the smelt. It schools round the coast and is caught in large quantities for bait.

To the *Carp* family belong the *Gudgeon* of the shores and the little *Minnows* of the streams.

PLEURONECTIDÆ, OR FLAT-FISHES.

The *Halibut* is the most important fish of this family. It attains a length of six feet and often weighs 300 or 400 pounds. A few are taken on our coasts.

The *Flounder* is the common flat-fish seen gliding along close to the sandy bottoms of our rivers and bays. They are sometimes a foot long and are good for the table.

GADIDÆ, OR CODS.

The common *Cod* is one of the most valuable fishes known for human food. It inhabits all the North Atlantic and is caught in great numbers both in Europe and America. Cods come to our coasts about the first of June and are taken all summer, sometimes as late as December. The best fish are caught on the banks with sandy bottoms some miles off shore. Cod-Fish feed on squids, caplin, young lobsters, clams, &c. They are taken with hook and line, and are split, salted, and dried for market.

Haddock resemble codfish, but are distinguished by a dark stripe along the sides. They sometimes associate with cods but generally school alone. Haddock are used fresh.

The *Hake*, or Ling, is distinguished from the cod by possessing only two dorsal fins and no barbule on the chin. It inhabits muddy bottoms, and is taken from July to November. The catch is one half that of cod-fish and is exported to the United States. The annual value of these three fishes taken here is $170,000.

Tom-Cod is a small fish of inferior quality, common in our harbors.

BLENNIDÆ, OR BLENNIES.

Blennies are found in the waters of the Gulf and appear in our harbors. They have elongated bodies with a single continuous dorsal and ventral fin. The *Sea Wolf* is a voracious species, six feet long, savage as a shark, and troublesome in robbing nets.

SCOMBERIDÆ, OR MACKERELS.

The *Mackerel* is distinguished by its beautifully clouded smooth skin, and broad-spreading, strong tail fin. The hinder parts of the dorsal and anal fins are divided into a number of small fins. Mackerel come to our coasts the last of June. Then the glint of their scales may be seen as they sport in shoals in all our bays and harbors. Mackerel feed on small fishes, crustacea and worms. They frequent sandy and gravelly banks and dislike muddy bottoms. The north coast of our Island is one of the best mackerel fishing grounds in the world, and the mackerel is our most important fishery, being worth $200,000 or $300,000 annually. They are taken by hook and line and also by immense seine nets, which enclose a whole shoal at a time. The greater part of the catch is exported to the United States.

The *Tunny*, or *Horse Mackerel*, is a large fish of coarse quality, seldom used as food here.

PERCIDÆ, OR PERCHES.

Perch are common in all our rivers. *Bass*, which is a large and excellent fish, is taken at Miminigash and in King's County.

TRIGLIDÆ, OR GURNARDS.

The *Sculpin* is an ugly fish with a large, spiny head, common in our harbors. Unprepossessing as it is, it constitutes the chief food of the inhabitants of Greenland. The *Stickle-Back* is a little fish which has the dorsal and ventral fins replaced by sharp spines; very common on the weedy flats of our coasts.

SYNGNATHIDÆ, OR PIPE-FISHES.

These fishes are distinguished by having their bodies covered with shields, or plates, which give them an angular form.

The *Pipe Fish*, which has a long, beak-like muzzle, and the beautiful little *Hippocampus*, or Sea Horse, are not uncommon on our fishing grounds.

Order 2.—ELASMOBRANCHII.

These have tufted gills and cartilaginous skeletons. They are the sharks and their allies.

Dog-Fishes are small, shark-like fishes common on the fishing grounds. They go in great packs and frequently rob the fisherman's nets. They are caught for their oil.

Blue Sharks are six feet long. They prey on the shoals of useful fishes in the Gulf, and are troublesome to those engaged in fishing. The *Thresher* is a fleet and voracious shark twelve feet in length. It has an enormous tail fin which it uses as a weapon of assault, and is the terror of the largest marine animals.

A single Thresher appearing in sight, will put a whole herd of Porpoises to flight, like hares before a hound.

Occasionally a great *White Shark* strays into our waters. It is twenty or thirty feet in length, with a mouth sufficiently large to take in the body of a man; and is everywhere known as a fierce and dangerous monster of the deep.

The *Skate-Fish*, or Thornback, is a flat fish, armed with prickly placoid scales on its back and tail. This prickly tail serves as a weapon of defence. It is quite common on all our coasts, gliding along the bottom and feeding on crustacea and mollusca.

CLASS 2.—AMPHIBIA.

The common *Toad* and several species of *Frogs* are abundant on the Island. The poor toad is a useful, though a repulsive animal, devouring large numbers of insects, which it captures with its extensible tongue. Green and bronze-colored Frogs are found in damp grass fields. The *Tree Toads* make the flooded swamps ring with their shrill piping in the still air of balmy spring nights. The *Wood Frogs* that associate with them in the ponds, make a hoarse, grunting noise. One species of Tree Toad climbs into the branches of trees, in late summer, and sounds its call from thence like a bird.

Two or three species of *Salamanders* inhabit damp places, the most common being the little, lizard-like animal which is found under stones and stumps.

CLASS 3.—REPTILES.

All our snakes belong to the *Colubridæ*, or harmless snakes. The common snake is the *Garter Snake*. The *Black Snake* is smaller. The Green Snake and Striped Snake are rare. Snakes feed on insects, frogs, young birds, &c. They pass the winter in a torpid state, sometimes great numbers together.

CLASS 4.—BIRDS.

Birds are the most interesting of all our animals. Their varied forms and brilliant plumes, their wonderful powers of flight and sweet rhapsodies of music,

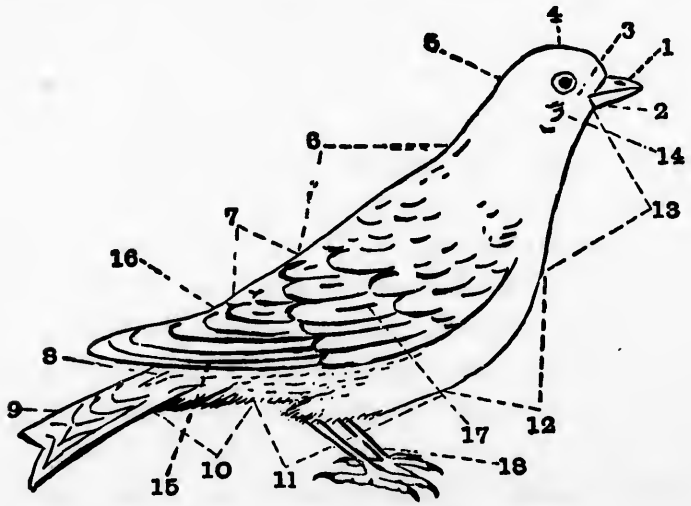

Fig. 5.—Snow Bunting, showing External Parts of a Bird.

1, Upper Mandible of Bill; 2, Lower Mandible; 3, Lore; 4, Crown; 5, Nape; 6, Back; 7, Rump; 8, Upper Tail Coverts; 9, Tail; 10, Lower Tail Coverts; 11, Belly; 12, Breast; 13, Throat; 14, Ear Coverts; 15, Wing Primaries; 16, Wing Secondaries; 17, Wing Coverts; 18, Tarsus.

their migrations and instincts connected with the care of their young make them objects of ceaseless interest whether found by ocean's foam or blooming orchard bough.

Natatores, or Swimming Birds.

During winter, wherever a stretch of open water breaks among the ice floes, the Herring and Black-backed Gulls sweep the wave in pursuit of their prey. The smaller Kittawake Gulls often accompany them; and whenever the season is milder, the Golden-eye and Pintail Ducks, the Goosander, and a rare Auk and Eider Duck are here too. The Black Mallard may now be seen about the heads of streams.

Wild Geese arrive in March, having wintered in the Eastern States. The White Snow Goose is sometimes seen with them. They are followed by the Brant in cloud-like flocks. When the ice breaks up in April, these birds become very numerous as do also those kinds which remained all winter. Now Red-breasted and Hooded Mergansers, Scotters, Surf Ducks, Sea Coots, Buffle-heads, Blue and Green-winged Teals come in numbers, and with the large flocks of Eiders, fill our bays with restless clouds of wings. The Loon, or Great Northern Diver, and the Cormorant are all summer on the coasts. Black Guillemots frequent the high rocky northern shores. They lay their two eggs in naked crevices of the sandstone cliffs.

Later in May, Bonaparte Gulls arrive in large flocks. These are the common small gulls of our rivers. They are accompanied by the Common and Arctic Terns. These long-winged beauties of the deep resemble the swallows in their airy flight, and are sometimes called Sea Swallows.

Gulls and Terns leave most of our harbors the latter part of June, to congregate in their nesting places on the sand dunes. They return in August with flocks of young. Gannets and other maritime species appear on the fishing grounds, and sometimes a Stormy Petrel will be driven ashore by a storm from the sea.

GRALLATORES, OR WADERS.

The Great Blue Heron is commonly called "Crane." The gaunt, grey forms of numbers of these tall wading birds may be seen, at low tide, in every bay throughout the Island. Blue Herons associate in large communities at nesting, called "heronries." There is a large heronry at the head of Howell's Brook, and several others throughout the Island. The American Bittern nests about creeks and fresh marshes.

We have twenty-five species of Plovers, Snipes, Sandpipers, Curlews, Phalaropes, and Rails. They are all birds of the sea shore and the oozy field of the marsh. They nearly all go to Labrador, or the more lonely northern wilds, for their summer nesting, and it is when returning southward with their young in autumn that they swarm in such numbers about our shores.

Woodcocks are here all summer, and nest on the borders of the damp grounds where they feed. The Peewit is on every shore, and rears its young in the upland meadows. The Solitary Sandpiper, with lighter plumage, wails by lonely ponds.

The Semipalmated Sandpipers arrive with their young the last of July. The Ring-neck Plovers follow the first week in August. Then come the loud-shouting Tattlers—though some of these breed here. Towards the last of the month the favorite Golden Plover arrives with a host of kindred birds.

Sanderlings are light-plumaged Sandpipers, very abundant in autumn on the sand reefs and dunes of the north coast. They feed on the marine insects cast ashore by the waves, and their clear *peep* and constant flitting do much to relieve the loneliness of these wild scenes. In November large flocks of Phalaropes sometimes come into the harbors.

Rasores, or Scratchers.

Both the Canada Grouse and the Ruffed Grouse, or Partridges, are plentiful in our woods and thickets. The nest is rudely formed on the ground and contains a dozen cream-colored eggs.

Wild Pigeons are now exceedingly scarce, though once they were quite common on the Island.

Raptores, or Birds of Prey.

The Goshawk is a large, dark-colored hawk which stays all year round in the shadowed recesses of our

wood-lands. In winter it robs poultry yards and is the terror of the lesser birds of the forest. The Merlin is here in winter. The beautiful little Sparrow Hawk arrives in April. The hen hawks of summer are the Red-tailed and Red-shouldered Buzzards. It is the Red-tailed Buzzard which performs those wonderful aerial feats of wheeling round in great circles on motionless wings, and ascending with each revolve, till at length it is lost in the depth of the summer sky. The Golden Eagle and the Bald Eagle visit us sometimes, and the Osprey fishes on our coasts.

The Peregrine Falcon is the most powerful and beautiful of our hawks. It builds its eyrie in the lonely forest summits and makes its forays along the rocky coast where ducks and guillemots swarm the wave. The still larger and more powerful Gyrfalcon, of the Arctic regions, is an occasional visitant in winter, preying on crows or other large game.

We have seven Owls, all fluffy, grey or brown, lovers of the darkness, seeking their prey during the shadowy hours and dozing in the thickets through the day. The Great Snowy Owl visits us in winter and is partly a diurnal bird. The Horned Owl is a large, brown bird. The Barred Owl is the hooting owl. The Acadian, or Saw-Whet Owl is the smallest of the owls. During early spring evenings its constantly repeated notes of *kook*, *kook*, echoing through the naked forests, sound like the regular tolling of a bell.

Scansores, or Climbers.

The Downy, Hairy, and Black-backed Woodpeckers stay all the year round. They are the well known spotted woodpeckers which are constantly tapping at the trunks of decayed trees to dig out the larvæ of insects buried in them. The Yellow-bellied Woodpecker and the large black Log-cock are summer visitants. So also is the Gold-wing Woodpecker so well known for his loud, oft-repeated cry of *wakeup*, and his nest-hole high in the trunk of a dotard rampole, where his mate stores her seven beautiful porcelainous white eggs.

Insessores, or Perching Birds.

This large order includes all our singing birds and many which are not properly birds of song.

The Belted Kingfisher arrives the first of May and digs his nest-hole in banks of streams. He takes his prey by poising steadily on the wing till he sights his game, then dashing headlong into the tide to secure it. The nest, in the extremity of the deep burrow, is formed of the bones of fishes.

The Yellow-billed Cuckoo visits us in midsummer.

Night Hawks are very common, arriving the latter part of May to winnow the evening air for mosquitoes and larger insects. They make no nest, but lay their speckled eggs on the bare ground.

Ruby-throated Humming-birds visit our gardens every summer to rifle nectar from the blossoms with

their slender beaks. Their flight is rapid and insect-like. The nest, woven of the soft down of willows and stuccoed outside with lichens, to similate its surroundings, is placed securely on a far-extending limb, and contains but two pure white eggs.

Flycatchers are dusky-plumaged birds which have the habit of sitting motionless on a perch until an insect passes, then suddenly dashing into the air to capture it, and returning again to the same perch. The King-bird is very common, fluttering about fence rows and petulantly pursuing other birds. The Pewee calls loudly from naked rampoles *pewee, pewee, pewee.* Trail's Flycatcher and the Least Flycatcher are common.

Crows are here all the year round, getting scarce, however, in midwinter. The Crow is a bird of much resource. He digs clams, fishes smelts, makes nutting excursions to the woods, and never misses the chance of a good meal on grasshoppers, locusts, and June-bugs. The bright-plumed Blue Jay and the fluffy, dull-colored Canadian Jay are resident birds.

Purple and Rusty Grackles whistle by the ponds, near which their mud-plastered nests with four speckled eggs are built.

We have nine Sparrows, all delightful birds of the fresh summer fields, active and pleasing songsters. The Song Sparrow will sometimes stay all winter, but the regular flocks arrive in April, filling the first sunny mornings with their sweet notes. The Fox-colored and White-crown Sparrows are seen only for a week at this time, as they go northward to nest. The

Grass Finch is a loud and clear singer. Savanna Sparrow's nests are very common on the ground in grass fields. The Chip Sparrow builds its nest of hair in trees, and lays blue eggs. White-throat Sparrows are common. Their song is a loud ringing whistle. Sharp-tailed Sparrow is rare. Tree Sparrows are common in November, when going south with their young. The Blue Bird *(Junco)* arrives with the first sparrows.

The Canadian Goldfinch is a bright yellow bird with black wings and tail. He is a gay rover in fields and pastures, where he scatters the ripe down of thistles to the breeze, while rifling the seeds for a meal. The Pine Goldfinch is a winter bird. The Common Redpole comes in flocks about the stackyards in winter, looking for seeds; but the Crossbills feed among the cones of the lofty spruces. At this season too, the Snow Buntings come in white flocks to our snow-clad fields. They feed on stray seeds and grains, and with the first suns of April are away to their nesting ground in the Arctic regions.

The Purple Finch, or Linnet, is one of the most brilliant songsters of our groves. The male wears a rich crimson cowl, but the female is a dull-colored bird. Crosbeaks are beautiful birds, nearly as large as Robins, with bright carmine heads and breasts and white bars on their dusky wings. They come in flocks, in autumn, to feed on the buds and seed of the spruce trees.

We have four species of Swallows. The Barn

Swallow is the largest, with a long forked tail. Eaves Swallows build their clay nests in colonies under the eaves of barns. White-front Swallows are colored white below and brilliant steel green above. Bank Swallows are dun-colored birds, and make their nests in holes in high banks. The sooty Chimney Swifts build in chimneys. All these graceful, fleet-winged birds live on insects, which they take on the wing, and stay with us only during two or three of the brightest months of summer.

The Shrike, or Butcher Bird, is but rarely seen here. It is an ash-colored bird, about the size of a Robin, and preys on smaller birds.

Of the beautiful and sweet-voiced Warblers we have fifteen species. They are all birds of the woodland, secreting their hair-lined nests in the thickets, and filling the leafy bowers with the thrill of their clear melody. The Yellow Red-poll, Pine-Creeping, and Yellow-rump Warblers come the first of May and stay till October. But the Black-throat Green, Blue Yellow-back, Bay-breasted, Tennessee, Maryland Yellow-throat, Magnolia, Summer, Black-poll, and Mourning Warblers and the Black-and-white Creeper, Gold-crown Thrush, and Redstart wait till the last of the month, and then come in a crowd, some to stay with us two or three months, others to pass rapidly on to nesting grounds farther north.

The Black-cap and Hudsonian Chickadees, the Nuthatches and little Gold-rest Regalus are permanent residents not much noticed in summer but

doing much to enliven the gloom of our winter woods.

Three Thrushes enliven our wood-lands with their full notes. The Olive-backed Thrush is not common. The Hermit Thrush is common and the most tender and plaintive musician of the grove. It is a delicate, brown bird, smaller than a Robin, of retiring habit, seldom seen, but often heard on bright spring evenings pouring out its delightful melody. The nest is on the ground, with four blue eggs.

Robins are abundant and favorite birds. They build their mud-lined nests in the garden or on the lofty forest trees, and raise two or three broods in a season. They feed on worms and grubs, but relish soft fruits from the wilds or the garden. Where mountain ashes supply them with food, Robins will sometimes stay all winter. During the mild winter of 1889 large flocks remained here.

CLASS 5.—MAMMALIA.

The mammalia are characterized by suckling their offspring while they are young.

Fig. 6.—Skull of Fox, showing Dentition.—*a*, Incisors; *b*, Canines; *c*, Pre-Molars; *d*, Molars.

Rodentia, or Gnawing Animals.

These animals have two large cutting teeth in the front of each jaw, adapted for gnawing.

The *Beaver*, though not now on the Island, was once common here, and remains of its dams are still to be seen on streams in many parts of the country.

The *Musk Rat* is common about streams and ponds. It burrows in the banks and is troublesome in mill dams. It feeds on roots, seeds and shell-fish.

Mice.—We have three field mice. The common, short-tailed *Meadow Mouse* lives on grain and grasses. It builds a nest of dry grass and makes long galleries under the snow in winter when it causes much destruction by barking young orchard trees. The *White-footed Mouse* and the *Hamster Mouse* are much less common. The domestic Mouse and Rat are European importations.

Squirrels.—Our gay little squirrel, so plentiful and so pert in every wood where beech nuts are found, is the *Red Squirrel.* A black variety of this squirrel is not rare. The *Ground Squirrel*, or Chipmunk, digs its burrows under the roots of the great trees in a spruce wood. It has cheek pouches, in which it carries grain and nuts, and is noted for laying up stores of these for winter use. The *Flying Squirrel* is not rare, but being nocturnal in its habits, is seldom seen. It nests in hollow trees, and is distributed from Canada to Mexico.

"Rabbits," or more properly *American Hares*, are

very numerous. They feed on grass in summer and on the young shoots of trees in winter. Their color changes from brown in summer to white in winter. Their flesh, when properly prepared, is excellent. "Rabbits" like dry ground in summer but frequent swamps in winter.

INSECTIVORA.—INSECT-EATING ANIMALS.

These little animals have sharp canines and three-pointed molar teeth.

The *Mole* is a small animal with thick fur and deeply-sunken eyes which burrows in waste lands and feeds on worms and grubs. The little *Shrew Mole* burrows under stumps and explores the grass lands for insects. Its tiny, chain-like trail is often seen on the snow in winter.

CHEIROPTERA.—WING-HANDED.

These animals have the fore limbs converted into wings for flying.

The *Common Bat* is plentiful, flitting about in summer evenings, after dusk, in pursuit of the insects on which it feeds. It hides away in some secure cranny about buildings, or in a hollow tree, and passes the winter in a torpid state.

CETACEA, OR WHALES.

The animals of this order have smooth fish-like bodies, with a horizontal tail fin and the fore limbs in the form of paddles.

The great *Rorqual*, or Finner Whale, which attains the length of a hundred feet, and the *Hump-back Whale* appear on our coasts and are occasionally drifted ashore dead. They are whalebone whales, supplying whalebone and blubber for oil.

Of cetaceans with ordinary teeth we have the *Black-fish*, *Porpoise* and *Beluga*. They all go in droves and feed on fish especially following the shoals of herring and mackerel. They are from six to twelve feet in length. The first two are black and dark brown, the Beluga is white. All of them are valuable for oil.

Ungulata.—Hoofed Animals.

The *Elk*, or *Moose Deer*, is not now found on the Island, but as its antlers are sometimes picked up in our wild lands it probably once ranged here as it now does on the adjacent continent.

Carnivora.—Flesh-Eating Animals.

The *Common Seal* is quite common in our bays. In places, as at Gallas Point, it comes ashore in herds to bask on the sands. This seal is four or five feet long. Its countenance is mild and expressive, like that of a dog, It is easily tamed, and then shows great intelligence and attachment to man. The *Walrus* was common on some parts of our coasts at the early settlement of the country but is now unknown.

The *Black Bear* is our only dangerous wild animal, and is found in the large wooded tracts of the eastern

and western counties. He sometimes takes a sheep or lamb from the new settler's flock, but prefers to subsist on berries and wild fruit. He is fond of oats. On coming into an oat field, the Bear sits on his haunches, and gathering a bundle of the grain in his arm, eats the heads off. When this is devoured, he scuttles along to obtain a fresh supply, and, in this manner, does great damage to the crop. The Bear rarely attacks human beings unless enraged. In winter he retires into a den and passes the season in a torpid state.

The *Otter* lives much in ponds and streams, subsisting on fish which it takes like a seal. When fish fail, it will attack lambs and poultry. The fur of the Otter is fine, thick, and much valued.

The *Mink* is eighteen inches long without the tail, and of a dark brown color. It is semi-aquatic, living about streams and feeding on fish and frogs, as well as small land animals and poultry. The *Martin* is a woodland animal nesting in hollow trees and feeding on birds and small animals. It is the size of a mink, but fawn-colored. The skins of both animals are valuable furs. The *Weasel* is a beautiful and agile little animal of the same family frequently seen about farmsteads where it comes in search of mice. Its color is brown in summer and white in winter.

The *Fox* is quite common. Seldom abroad in the day, it prowls round at night, feeding on young birds and quadrupeds and robbing poultry yards. Though slightly built, it is very strong, fleet and active. There

are three varieties, the Red, Silver-grey and Black. The fur of all, especially the latter two, is valuable.

Wolves have been known to cross the Northumberland Strait on the ice and visit the Island.

The *Wild Cat*, or *Lynx*, was once not uncommon here but is now unknown. It is more than three feet in length and of a hoary grey color with a dark brown space on the back. It lives on small quadrupeds and birds, pursuing the latter to the tops of trees.

ETYMOLOGY OF NAMES IN ZOOLOGY.

Annulata (Lat. ***anulus*** a ring), the 5th division of the Animal Kingdom.

Aphaniptera (Gr. ***aphanos*** obscure, and ***ptera*** wings), an order of the Insecta.

Aptera (Gr. ***A*** without, and ***ptera*** wings), an order of the Insecta.

Arachnida (Gr. ***arachne*** a spider), the highest class of the Arthropoda.

Arthropoda (Gr. ***arthros*** a joint, and ***podes*** feet), the 6th division of the Animal Kingdom.

Brachiopoda (Gr. ***brachion*** an arm, and ***podes*** feet), an order of the Mollusca.

Campanularia (Lat. ***campanula*** a little bell).

Cephalopoda (Gr. ***kephale*** the head, and ***podes*** the feet), the highest class of the Mollusca.

Coleoptera (Gr. ***koleos*** a sheath, and ***ptera*** wings), an order of the Insecta.

Crustacea (Lat. ***crusta*** a crust or hard covering), a class of the Arthropoda.

Diptera (Gr. ***dis*** two, and ***ptera*** wings), an order of the Insecta.

Echinodermata (Gr. ***echinos*** a spine, and ***derma*** skin), the 3rd division of the Animal Kingdom.

Elasmobranchii (Gr. ***elassoo*** to reduce, and ***branchiæ*** gills), an order of Fishes.

Gasteropoda (Gr. ***gaster*** the belly, and ***podes*** the feet), a class of the Mollusca.

Hemiptera (Gr. ***hemi*** half, and ***ptera*** wings), an order of the Insecta.

Hydroid (Gr. ***hydor*** water, and ***eidos*** resemblance).

Hymenoptera (Gr. ***hymen*** a membrane and ***ptera*** wings), an order of the Insecta.

Insecta (Lat. cut into), a class of the Arthropoda.

Lamellibranchiata (Lat. a thin plate, and ***branchiæ*** gills), a class of the Mollusca.

Lepidoptera (Gr. ***lepis*** a scale, and ***ptera*** wings), an order of the Insecta.

Mollusca (Lat. ***mollis*** soft), the 4th division of the Animal Kingdom.

Myriopoda (Gr. ***myrias*** a myriad, and ***podes*** feet). A class of the Arthropoda.

Neuroptera (Gr. ***neura*** nerves, and ***ptera*** wings), an order of the Insecta.
Noctiluca (Lat. ***noctis*** of the night, and ***lux*** light).
Orthoptera (Gr. ***orthos*** straight, and ***ptera*** wings), an order of the Insecta.
Pteropoda (Gr. ***ptera*** wings, and ***podes*** feet), a class of the Insecta.
Polypi (Gr. ***polys*** many, and ***podes*** feet).
Protozoa (Gr. ***prota*** the first, and ***zoa*** life), the lowest division of the Animal Kingdom.
Sertularia (Lat. ***sertum*** a wreath).
Teleostei (Gr. ***teleos*** perfectly, and ***osteon*** a bone), an order of Fishes.
Tubicolæ (Lat. ***tuba*** a tube, and ***colo*** to inhabit).
Tubularia (Lat. ***tuba*** a tube).
Zoology (Gr. ***Zoon*** an animal, and ***logos*** a discourse).

ERRATA.

On page 69, first line at top, the words "CLASS IV." should be omitted.
On same page, sixth line from top, the word ***"Peris"*** should be spelled ***Pteris.***

DRY GOODS

Ladies'

DRESS GOODS

CLOTHS

SILKS

S

L

CORSE

M

AND AL

F

ST

Men's

A large stock Hard and Soft Felt

HATS

In the newest styles and at