

ART. VIII.—MONOGRAPH OF ERICACEÆ OF THE DOMINION OF CANADA AND ADJACENT PARTS OF BRITISH AMERICA. BY GEORGE LAWSON, PH. D., LL. D., *Professor of Chemistry, Dalhousie College, Halifax, N. S.*

(Read April 10, 1871.)

THE order Ericaceæ embraces plants which for beauty are not excelled by any that are known to Science, and although their affinities are clear and the order is a perfectly natural and well defined one, yet its members are so polymorphous that there is not only great variety within its limits in habit and foliage, but also in the structure and number of parts of the flower, and in the real character as well as outward aspect of the fruit. Most of these plants are shrubs, some tall and erect, others dwarf and procumbent; some have deciduous leaves, others are broad-leaved evergreens, the duration of the leaves often differing in species of the same genus; some are humble herbaceous plants with a rosette of evergreen radical leaves and annual flower-stalks; and some are scaly leafless parasites. In the Whortleberry group the calyx-tube is adherent to the ovary, forming a succulent fruit. In the Rhododendron and Heath Group, there is no adhesion, and the fruit is dry and dehiscent, except in *Arctostaphylos*, which has a succulent fruit. In the *Pyrola* group the corolla is polypetalous; in most of the other groups it is gamopetalous and usually but not always regular, the petaloid divisions of equal size. In this order we have the connecting link that bridges over the gap between polypetalous and gamopetalous exogens, for it includes some plants that must be referred to the one division, and some that as surely belong to the other, thus showing that the distinction is neither an absolute nor a natural one when applied to orders.

The largest and most showy plants of the order belong to the *Rhododendron* tribe, of which many new species have been discovered and introduced to gardens of late years. M. Maximowicz has re-arranged the genera of this tribe in accordance with the growing opinions of botanists that some of the old generic distinc-

tions must be laid aside. His two primary groups are: 1st. Phyllodoceæ, with a firm closely adhering seed coat destitute of wing-like appendages, flowers in the axils of the older uppermost leaves. Phyllodoce, Loiseleuria, Kalmia. 2nd. Eu-Rhododendrea, with loose seed coats prolonged into wing-like appendages, flower buds surrounded by scaly overlapping bracts, and usually quite distinct from the leaf buds. Ledum, Menziesia, Rhododendron. In the last mentioned genus, Azalea and Rhodora are both merged, as the characters depending upon regular or irregular corolla, separate or combined petals, number of stamens, annual or biennial leaves, membranous or coriaceous, and presence or absence of scales, are not available for generic distinction.

The general features of distribution of these plants over the globe were pointed out. They are social plants wherever they are found; they cover immense tracts at the Cape of Good Hope, the species of that region being the beautiful forms known in our conservatories as Cape Heaths. They are in other forms of the same or closely allied genera, the characteristic plants of the "moors" and "heaths" of Northern Europe, "with their purple blossoms rich in honey." They are in like manner the peculiar vegetation of our Nova Scotian "barrens," producing rich flowers in early summer time, and later in the season, furnishing a bountiful sustenance to the furred and feathered game of the country, and offering to the rural population more fruit than they can either use or sell. In Northern Asia they clothe the Himalayan slopes with evergreen foliage and the gayest of flowers, and fill the atmosphere with their too powerful odours. On the lofty mountains of South America they creep as far up towards the summits as it is possible for plants of any kind to exist. And in North America they stretch from the arctic shores southward along the several ranges of mountains, or step from peak to peak, over the whole continent. It is in cold countries alone, and especially on the American continent that this order rises high in the rank of economic plants.

The paper embraced a detailed description of all the species inhabiting the Dominion, with full information respecting their distribution over the region. By means of extensive series of specimens collected by members of the Botanical Society of Canada

throughout the Provinces of Ontario, Quebec, Nova Scotia, New Brunswick, Newfoundland, Labrador, Manitoba, and the Northern and Western regions so long occupied by the Hudson's Bay traders, the distribution of the various species has been ascertained with some degree of precision from the southern boundary of the Dominion northwards to the arctic shores, and westward to the Rocky Mountains, but in regard to the Pacific side there was still great want of information. The Ericaceous Flora of the Pacific Coast shows in some respects a closer affinity than that of the Atlantic to Asiatic and European forms; but on the other hand a large number of our Dominion species belong to the old arctic flora that encircles the northern polar regions.

*Gaylussacia resinosa* is our common Black Huckleberry, widely diffused over the Dominion, but nowhere so abundant or so well known as in Nova Scotia. *Vaccinium macrocarpum* is the American Cranberry, of which several varieties are now in cultivation; it abounds in the swamps of Nova Scotia, Newfoundland, Sable Island, around the Gulf Shores, and generally throughout New Brunswick, Quebec and Ontario, stretching westward through British territory to the Pacific, where its use is known, although quite absent from the prairie country of the Western States. *V. Pennsylvanicum* and *corymbosum* yield the well known blue berries. *Vitis Idæa*, a common form in Northern Europe, is frequent on hills on both sides of the Lower St. Lawrence, and around the Gulf Shores, Anticosti, Newfoundland, Nova Scotia, New Brunswick, &c., extending north to 70° and west to Sitka. In Europe the use of its berry is not known; in New England Prof. Gray speaks of it as barely edible, and Mr. Wood also, in his American Flora characterizes it as mealy and sour. All that is true of it in the raw state, but it is nevertheless one of our very best berries for cooking, making a delicious preserve, and used all over the Province under the name of Cowberry. It is extensively used also throughout Rupert's Land, where it is *the* Cranberry, and according to Richardson "excellent for every purpose to which a cranberry can be applied," being a great resource to the Dog ribs and Hard Indians, as well as to Europeans. In Greenland, the Danish residents also use it as a preserve, according to R. Brown *secundus*, in

**Florula Discoana.** *V. Oxycoccus* extends across the continent, but is not very common. *V. Myrtilus* is confined to the Pacific region. *Chiogenes hispidula* the Capillaire or Maiden Hair of Nova Scotia, produces its white wax like berries so abundantly that they are made into an elegant preserve, especially in Cape Breton. *Arctostaphylos alpina* is a Newfoundland and common northern species, not well known in Southern Canada, but stretching along the whole arctic coast. In the specimens sent by Mr. McTavish the fruit is black, but Sir John Richardson describes a red-fruited sort also. *A. Uva-urisi* is common throughout the Dominion, apparently increasing to the north and west, whence Dr. Schultz, M. P. P. for Lisgar, sends it as the Kinikinik of the Crees, who, as well as European fur traders, mix its dried leaves with their tobacco. *Epigæa repens* is the emblematical "Mayflower" of Nova Scotia; "we bloom amid the snows." It extends through the United States, but only along the Atlantic seaboard, and is not uncommon along the shores of the St. Lawrence Gulf, and although extremely rare in Ontario, extends to the Saskatchewan. Its flowers exhibit dimorphism, in reference to which several points were suggested for investigation, and Mr. Jones, F. L. S., expressed the belief that fertilization was effected by the large humble bee of Nova Scotia. *Gaultheria procumbens* is a common Canadian plant, yielding the fragrant oil of winter green, which has of late years been much used by perfumers. This oil consists of an acid ether, methyl salicylic acid, which, when distilled with caustic potash, yields methyl alcohol and salicylic acid.

In *Gaultheria procumbens* a remarkable structure was described; there projects from each tooth of the leaf a long terete brown glandular process, arising from a larger base. A similar structure is seen in the *G. Shallon* of the Pacific Coast, but there is in addition scattered over the lower surface of the leaves of that species brown dots, which are the rudimentary bases of similar but undeveloped processes. In the East Indian *G. ovalifolia* of Wallich (1523), Hooker's *Icones*, 246, these gaultherian processes, as they may be called, are fully developed, not only on the margins, but over the whole lower surface of the large leaves, each gland arising from a large flattened disk-like base. These peculiarities do not seem to

have been previously described; they will probably be viewed as presenting a case of development, the peculiar structures commencing in our Nova Scotian *G. procumbens*, where they are confined to the margins of the leaves, developing, as an intermediate stage, in *G. Shallon*, where their rudiments appear on the lower surface of the leaf likewise, and finally acquiring completeness in *G. ovalifolia*, in which the whole under surface and margins are provided with them in the most highly developed form.

*G. Shallon* does not come eastward more than a hundred miles from the Pacific Coast. *Cassandra calyculata* abounds in every swamp about Halifax, and is not rare throughout the Dominion; in the far north it becomes more scaly. *Andromeda polifolia* grows in Newfoundland, Labrador, Anticosti, but is chiefly a northern species, extending to the arctic shores, and often bearing the black blotches of *Rhytisma Andromedæ*, observable on the cultivated plant in European gardens. *A. tetragona* is an extremely arctic species, forming a turf, which affords a scanty fuel to voyagers in the most desolate regions; it grows on all the arctic shores of the old and new world. *A. hypnoides*, which occurs on the White Mountains and Labrador, is one of our rarest plants. *Kalmia glauca* is chiefly confined to the maritime Provinces, and probably does not produce its flowers in Ontario. It was known to European Botanists long before being described in *Hortus Kewensis*; it is the *K. linearifolia*, Menzies, who found it last century "in paludibus juxta Halifax, Nova Scotia;" and specimens collected by Sarrazin nearly two hundred years ago were found by Smith in 1786, in the then old Herbarium of Valliant at Paris. *K. angustifolia* is one of the handsomest plants of our Nova Scotian barrens, and seems to thrive best in the poorest soils, where it has plenty of moisture, exhibiting with us a very different appearance from that which it presents in inland localities. *K. latifolia* has been recorded by Sir John Richardson, Mr. Billings and others, as Canadian, but there is no evidence of its existence within our limits. *Rhododendron Canadense* is an Atlantic plant, especially abundant in Nova Scotia, where Colonel Hardy has found a variety with pure white flowers. *R. Lapponicum* is chiefly of northern range. *R. maximum* is not known within our limits, although Gray says it is

an inhabitant of Maine. *Ledum latifolium* is not uncommon in swampy grounds, especially in the maritime provinces, where it blossoms profusely, and farther north the narrow leaved *L. palustre*, with twice as many stamens, seems to take its place. *Loiseleuria procumbens*, a dwarf alpine plant of northern Europe is extremely arctic with us, but finds a resting place on the lofty summits of New Hampshire; it is one of the fuel plants of the arctic voyagers. *Moneses uniflora* is found at Mount Uniacke, by the Rev. J. B. Uniacke, Rector of St. George's, and other *Pyrolæ* are not rare. *Pterospora* is confined to Ontario. For the Scotch Heather, *Calluna vulgaris*, several localities have been ascertained in Nova Scotia and Cape Breton, in addition to those previously published.

In conclusion the Author referred to the poisonous and intoxicating properties attributed to some Ericaceæ. *Kalmia angustifolia* is well known to our farmers as "Lamb poison," from the sickness and occasional deaths caused to lambs that nibble the young shoots in early summertime. Burnett has attributed poisonous effects to the honey of *Kalmia latifolia* in the United States. The following notices of poisonous honey have been kindly furnished by Professor Johnson, of Dalhousie College:—

*From Xenophon's Anabasis:*—"Having passed the summit, the Greeks encamped in a number of villages containing abundance of provisions. As to other things here, there was nothing at which they were surprised: but the number of bee hives was extraordinary, and all the sailors that ate of the combs lost their senses, vomited, and were affected with purging, and none of them were able to stand upright; such as had eaten a little were like men greatly intoxicated, and such as had eaten much were like mad men, and some like persons at the point of death. They lay upon the ground in great numbers, as if there had been a defeat; and there was a general dejection. The next day no one of them was found dead, and they recovered their senses about the same hour that they had lost them on the preceding day; and on the third and fourth days they got up as if after having taken physic."

*Pliny's Natural History, Book XXI. Section 44.*—"At Heraclia in Pontus the honey made by bees in some years is most dangerous. Writers have not mentioned from what flowers this is collected: We shall record what we have discovered. There is a plant called *aegelethron* [goat's bane, literally; probably the *Azalea*

*Pontica*, Linn.,] from its killing beasts and especially goats; from the flowers of this plant bees gather a dangerous poison, when it decays in a wet spring. The signs of poisonous honey are: it does not thicken at all, its colour is rather red, its strange smell immediately produces sneezing and it is heavier than harmless honey. Those who have eaten it throw themselves on the ground, trying to cool themselves, for they burst into a profuse perspiration. There are many cures which we will mention in their proper places. But as the danger is great, it may be as well to indicate some at once; such as old mead made of the best honey and of rue, and salt fish taken frequently if it be thrown up. It is certain also that this poison reaches dogs through the excrement, and that they are put in like pain. However it is well known that mead made of it when kept till old is quite harmless, and that women's complexions are not improved by anything better than by this when combined with *costus* (an oriental aromatic plant) and with bruised aloe."

*Pliny's Natural History*, XXI., 45.—"In the same region of Pontus in the tribe of the Sanni there is another kind of honey which is called *mænonomenon* (maddening) from the madness it produces. It is supposed to be collected from the flower of the rhododendron, with which the woods abound, and when this tribe give the Romans wax as tribute, they do not sell the honey because it is fatal."

*Strabo's Geography*, Book XII., Sec. 18, (Ed. Teub.) "The Heptacometae (a people of Pontus) destroyed three cohorts of Pompey which were marching through the mountains by putting on the roads cups of maddening (*mænonomenon*) honey, which the twigs of trees produce, for they easily slew the soldiers who were driven mad by the draught."

ART. IX.—ON THE METEOROLOGY OF HALIFAX. BY FREDERICK ALLISON, ESQ.

(Read May 8, 1871.)

JANUARY, 1870, was a month of unusual warmth, more than 7° above the average temperature of eight years, and not approached by any January since 1863. The pressure was great on the whole. Some of its more remarkable peculiarities are noticed in a paper read by me before this Institute in May last. Cloud was rather