Art. IV.—On the Canadian Species of the Genus Melilotus.—By Prof. George Lawson, Ph. D., LL. D., F. R. S. C., F. C. I., &c.

(*Read March* 9, 1885.)

The object of the following notes is to invite the attention of observers to the distribution of the species and varieties of *Melilotus* throughout Canada, so as to clear up some confusion that has arisen from imperfect observation, or mistake in nomenclature.

The *Meliloti* are old world plants, belonging originally to Europe, North Africa, and Asia; but we have in Canada at least two well-established species, and one of them, there is reason to believe, has been strengthening its hold ever since the days of the old French settlements at Quebec and in Acadia. In Europe, where these plants are more numerous in species and more abundant in quantity than with us, they are usually found growing on loose sandy soils; on railway embankments; rubbish-heaps; river and sea-shore banks; where, from land-slides or gradual denudation, a close turf is prevented from forming, and, generally, where the surface soil has been denuded of its original vegetation and left loose enough for the growth of annual or biennial plants. They are especially prone to appear on ballast heaps. From the great centres of old world civilization they have spread as colonists over North and South America, to Bermuda, and to other parts of the world far distant from their original homes.

The plants described by Tournefort under the generic name *Melilotus* were included by Linnæus in his genus *Trifolium*, which he divided into five sections. The first section consisted of the *Meliloti*, and, in the Species Plantarum, the capital letter M. for Melilotus is repeated on the margin before the trivial name of each species, thus:

TRIFOLIUM.

M. officinalis.
M. Indica.
Etc.

I do not know that any reason has been assigned for, or explanation attempted, of this apparent departure by Linnæus from his binominal rule. He may have intended merely to emphasize the section as a particularly well-marked one, or, perhaps, was unwilling to discard a long established and appropriate term. Whether the name *Melilotus* was intended to be used as a part of the trivial name, as indicated by Smith's mode of citing it—(given below)—or as a sub-generic term, which we may fancy is intended to be indicated by those who write "*T. officinale*, Linn," does not clearly appear. It is possible that Linnæus regarded this section of *Trifolium* as really entitled to generic distinction, and, anticipating its future elevation to the status of a genus, took this means of presenting to his followers the eminently appropriate name ready for use so soon as the distinctions and limits of the group should be fully ascertained. However it may be explained, this exceptional style of nomenclature created after confusion in the citations made by botanists from the Species Plantarum, as may be seen by the following instances, in some of which the generic name *Melilotus* is entirely ignored, and in others that of *Trifolium*:—

"*Trifolium Melilotus-officinalis*, Linn." — Smith's English Flora.

"*T. mel. officinalis*, Sp. Pl."—Lightfoot's Flora Scotica.

"*T. Melilotus officinalis*, L."—Koch's Synopsis Floræ Germanicæ. Loudon's Hortus Britannicus.

"*T. Melilotus*, L."—Hooker's British Flora, 5th edition.

"*T. officinale*, Linn."—Aiton's Hortus Kewensis, 2nd ed. Wight & Arnott's Prodromus. Hooker's Brit. Flora, 5th ed. Watson's Bibliographical Index of N. American Plants.

"*M. officinalis*, Linn."—Torrey & Gray's Flora of North America. Hooker & Walker-Arnott's British Flora, 6th edition. Hooker's Student's Flora, 1st edition.

The *Trifolium Melilotus officinalis* of Linnæus's Species Plantarum included three well defined forms that are now regarded by botanists as well-established species, viz:

1. The type, or normal form, which appears to have been long known in France and other parts of Southern Europe, although a comparatively recent addition to the British Flora, having been found in England for the first time about the year 1849 or 1850, and shortly afterwards in Scotland. It has been known to English botanists hitherto, mostly, as *M. arvensis*, Wallroth, but now appears in Sir Joseph Hooker's Student's Flora (edition of 1884) as M. OFFICINALIS *Desrousseaux*, although *not* the *officinalis* of Willdenow, so commonly quoted by authors.

2. Linnæus's variety *b*, variously named by authors *Trifolium Germanicum*, Smith; *M. vulgaris*, Willdenow; *M. leucantha*, Koch; M. ALBA, Desrousseaux.

3. The variety *g*, which has been recorded as a native and not rare British plant ever since the time of Ray, and which was known during the latter part of last and early part of the present century as *Trifolium officinale*, Hull, subsequently as *Melilotus officinalis*, Willdenow, and is now recognized as M. ALTISSIMA, Thuillier.

Of the above mentioned three species, two have hitherto been credited to Canada, viz: *M. alba*, Desr., and *M. altissima*, Thuillier. Respecting *M. alba* there is no question. It is a well known plant. It appears to be doubtful, however, whether *M. altissima* is established as a Canadian species, although it is so very common in Britain. All the Canadian yellow-flowered specimens of *Melilotus* that have reached me, so far, belong to *M. officinalis*, Desr., not *M. officinalis* Willd. Whether the United States plant is *M. altissima* or *M. officinalis*, I have not ascertained. Possibly we may have both species on this continent, but the only certainty in the matter is that we do not as yet know the distribution of either.

1. MELILOTUS OFFICINALIS, *Desrousseaux.*

This species, although, like the others, variable in size, habit and duration, being sometimes an annual, but usually a

biennial, may be readily distinguished from its congener, *M. altissima*, by its cylindrical, plump, shining, bright-colored, transversely wrinkled, *glabrous* pod; in the flower, the wings and standard are about equal in length, longer than the keel. We still need more careful observation as to how far these differences in the comparative lengths of the vexillum, alæ and carina are constant in the several species of *Melilotus;* these differences were first specially noted in Dr. Hayne's communication, dated Schnobeck, 9th October, 1807, to Schrader's Neues Journal fur die Botanik. Although the flowers of *M. officinalis*, Desr., are constantly yellow in Britain and America, there is a white-flowered European form, named *T. Petitpierreanum*, for "Herr Petitpierre, General de la Grande Armée;" *T. Kochianum*, for "Herr Chirurgus Koch, in Gnadau."—*(See Hayne's letter.)*

This plant grows abundantly on the banks of the Avon River, near Windsor, Nova Scotia, where it has been long established, and presents every prospect of permanence; it is also general on the citadel, and in several other localities around the City, of Quebec, appearing as much at home as any of the original native plants. During the visit of the British Association to Montreal in 1884, I found it growing wild in the streets of that City, and Mr. P. Jack obtained it on the Montreal Mountain.

It is not improbable that the Canadian localities hitherto assigned to *M. altissima*, Thuillier, or some of them, may prove, on examination, to belong to this species. Indeed, I think it very probable that the localities given by Sir William Hooker in the Flora Boreali-Americana, viz: "About Montreal and Quebec. Lady Dalhousie, Mrs. Percival," belong to this species.

In Prof. Macoun's Catalogue, I, p. 107, *M. altissima, (M. officinalis, Willd.)*, is said to be "naturalized at Pictou and Halifax, N. S." So far as I know, we have no established *Melilotus* in the Halifax district; but *M. officinalis*, Desr. (not *altissima)* appeared spontaneously one season in a sowing of *M. alba*, in the garden of Mr. P. Jack, Bellahill. As regards Pictou, Mr. A. H. MacKay, M. A., Principal of the Pictou Academy, has kindly taken the trouble to collect specimens for me on the

ballast hills there, where he says the *Melilotus* is of comparatively recent introduction, and they all prove to belong to *M. officinalis*, Desr. That species may thus be regarded as an established plant at Windsor, Nova Scotia, Quebec and Montreal, and as "casual" or imperfectly naturalized at Pictou. At all of the stations where it is now permanently naturalized, it probably owed its origin to the early French settlers. It is the species described in Vaillant's Flora Parisiensis, and other French Floras of last century, and seems to have followed the movements of the French people. As regards the plants reported from New Brunswick, Ottawa, Belleville, Toronto, and London, Ont., they may or may not be referable here.

Melilotus officinalis. Desrousseaux, in Lamarck's Dict. IV., p. 63 (Koch), (1796,) Desfontaines, Flora Atlantica, II., p. 191, (Koch). Lois, Flora Gallica, ed. 2, II., p. 128, excl. syn. Willd., (Koch). Koch, Synopsis Floræ Germanicæ ed. 2, I, p, 183 (1843). Hook. fil., Stud. Fl. Brit. Isl., ed. 3, p. 96 (1884).

Melilotus officinarum Germaniæ. C. Bauhin Pinax, p. 331. Vaillant, Flora Parisiensis, p. 124.

Trifolium Melilotus officinalis (a). Linn. Species Plantarum, p. 1078.

T. vulgare. Hayne, in Schrader's Neues Journal fur de Botanik, II., p. 336 (1807).

Melilotus diffusa. Koch, in DeCand. Flore Francaise, V., p. 664, excl. syn. *a* DeCand. (Koch).

M. arvensis. Wallroth, Sched., 892 (Koch). Babington, Manual Brit. Bot., ed. 3, p. 72 (1851). Hooker & Walker-Arnott, Brit. Flora, ed, 6, p. 99 (1850). Hook. fil., Student's Flora Brit. Isl., ed. 1, p. 90 (1870).

Melilotus officinalis var. *floribus albis.* Koch, Synops. Fl. Ger., ed. 2, I., p. 183.

Trifolium Petitpierreanum. Hayne, in Schrader's Neues Journ. fur de Botanik, II., p. 337 (1807).

Melilotus Petitpierreana. Willdenow, Enumer., p. 790. Reichenbach, Fl. Exc., p. 498 (Koch). Koch, Synop. Fl. Ger., ed. 1, p. 167.

2. MELILOTUS ALBA, *Desrousseaux.*

This is a well known plant, often cultivated for bees, and it has attracted attention at different times as a source of fibre and paper pulp. In rich favourable soils it grows to a great size, rising to a height of from 6 to 10 feet, or even more. It is much branched, has clean and glabrous stems and foliage, and long dense racemes of numerous small white flowers. The wing and keel petals are shorter than the standard.

This species grows in great luxuriance about the Grand Trunk Railway yards at Toronto, and probably in other parts of Ontario; also about Montreal. It is specially a Railway Plant, but its range in Canada has not been traced. Being frequently cultivated, it is apt to occur as a "casual," and, in giving localities for it, observers should state explicitly whether the plant has taken permanent hold. In Halifax County it has been cultivated in gardens for many years, but does not spread.

Melilotus alba. Desrousseaux, in Lamarck's Encyclopedie Methodique, Botanique, IV., p. 63, (DC.) (1796). Reichenbach, Fl., Exc., p. 499. Koch, Synops. Fl. Germanicæ, ed. 2, I., p. 183. Eat. & Wr. 317. Gray, Manual, Bot. Northern N. S., p. 128. Brewer & Watson, Bot. California, I., p. 132. Hook, fil., Students' Flora, Br. Isl., ed. 1, p. 90. Watson, Bibliographical Index N. Am. Plants. I. p. 243. Macoun, Cat. Canad. Plants, I. p. 106 (1883).

Melilotus officinarum Germaniæ, flore albo. C. Bauhin Pinax, p. 331. Tournefort, Inst. Rei Herbariæ, p. 407.

Trifolium Melilotus officinalis, (b.) Linnæus, Species Plantarium, p. 1078.

Trifolium album. Lois. Flora Gallica, p. 479.

T. Germanicum, Smith, in Rees's Cyclopædia, XXXVI. (1819).

Melilotus officinalis (b.) alba. Persoon, Synopsis, I., p. 348 (1807). Nuttall, Genera, II., p. 104.

M. officinalis (b). Aiton fil., Hort. Kewensis, ed. 2, IV., p. 380 (1812).

M. vulgaris. Willdenow, Enumeratio Plantarum Horti Berolinensis, p. 790 (Koch), (1809). Spreng. Syst., III., p. 206,

(Koch). Koch. Synops. Fl. Germ., ed. 1, p. 166. Babington, Manual Brit. Bot., ed. 3, p. 72 (1851). Hook. & Walker-Arnott, Brit., Fl., ed. 6, p. 98 (1850).

M. leucantha. Koch, in DeCandolle's Flore Francaise, V., p. 564 (1815). Seringe, in DeCand. Prodromus, II., p. 187 (1825.) Wight, Cat. Ind. Plants, No. 867. Wight & Walker-Arnott, Prod. Floræ Penins. Indiæ Orient., p. 196 (excl. syn. *altissima*, Thuill). (1834.) Beck, Bot., p. 78. Torrey & Gray, Fl., N. Am., I., p. 321. Torrey, Fl., New York, I., p. 171. Gray, Man. Bot., N. U. States, ed. 1, p. 108. Hook, Brit. Flora, ed. 5, p. 78 (1842). English Botany Supplement, t. 2689.

3. MELILOTUS ALTISSIMA, *Thuillier.*

This species is readily distinguished by its dull colored, somewhat flattened, pods, which are *distinctly pubescent or scabrous;* the standard, wings, and keel of the flower are equal in length.

Many of the numerous localities given for this species in Canada and the United States probably belong to *M. officinalis*, Desr. I have not, so far, seen a Canadian specimen of *M. altissima.*

Melilotus altissima.— Thuillier, Flore des environs de Paris, ed 2, p. 378 and 83. (1799.) Loiseleur-Deslongchamps, Flora Gallica, II, p. 4. (1807.) (Seringe.) Seringe, in De Candolle's Prodromus, II., p. 187. Hook. fil., Student's Flora of Brit. Isl., 3 ed., p. 96, (1884).

Trifolium odoratum sive Melilotus vulgaris flore luteo. J. Bauhin. Raii Synopsis Methodica Stirpium Britannicarum, ed. 2, p. 195, (1696).

Trifolium Melilotus officinalis (g.) Linnæus, Species Plantarium, II., p. 1078. Willdenow, Sp. Plant, II., p, 1355. Sturm, Deutsch. Fl., fasc. 1, p. 15. (Seringe.) Hudson, Flora Anglica, ed, 2, p. 322 (1798). Withering, Arrangement of Brit. Plants, III., p. 645 (1796). Linn, Syst. Veget., ed. Litchfield, p. 561 (1783).

Trifolium officinale.—Hull, British Flora, p. 162 (1799); ed. 2, I., p. 216 (1808). Smith, Flora Britannica, p. 781 (1800.) Willdenow, Species Plantarum, III., p. 1355 (1801.) Hooker,

Flora Scotica, p. 269. Smith, English Flora, III., p. 297. Aiton fil., Hortus Kewensis, ed. 2, IV., p. 380 (1812.) The following is doubtful:—Bigelow, Fl. Boston, p. 169.

Trifolium Melilotus altissimum.—Gmelin, II., p. 219 (Koch.)

Trifolium altissimum.—Lois, Flora Gallica, II., p. 4 (DC., Koch.)

Melilotus officinalis. Willdenow, Enumeratio Hort. Berol., II., pp. 789-90 (Seringe, Koch). Œder, Flora Danica, t. 934 (Seringe). Seringe in DeCandolle's Prodromus, II., p. 186 (1825). Koch, Synopsis Floræ Germanicæ et Helveticæ, ed. 1 p. 166. Hooker, British Flora, ed. 5, p 78 (1842). Hooker & Walker-Arnott, Brit. Fl., p. 98 (1850). Babington, Manual of British Botany, ed. 3, p. 72 (1851). Hook. fil., Student's Flora British Islands, ed. 1, p. 90 (1870). The following are more or less doubtful: Elliott, II., p. 199. Torrey, Flora of New York, I., p. 170. Torrey & Gray, Flora N. America, I., p. 320 (1838-40). Chapman, Fl. Southern N. S., p. 90. Gray, Manual, p. 128. Brewer & Watson, Bot. California, I., p. 132. Macoun, Catalogue, 1878, p. 11, No. 409. Jones, Transactions Nova Scotia Inst. Nat. Sc. Watson, Bibl. Index. Hemsley, Bot. Bermudas, Challenger Report, Botany, vol. 1. p. 28.

M. macrorhiza. Persoon, Synopsis, II. p. 348. Seringe in DeCandolle's Prodromus, II., p, 187 (Koch).

3. Melilotus Indica, *Allioni.*

This is a small, procumbent or ascending, rarely erect, plant, with branches spreading from the base. The racemes are short, of very small, almost sessile, crowded flowers, and elongate in fruit; pods globose-ovate, wrinkled.

This species occurs chiefly in the warmer parts of the south of Europe and in India. There are specimens from Brazil in the Edinburgh University Herbarium. In North America it had been found, when Torrey and Gray's Flora was published, only at New Orleans, as a recent introduction. It has since appeared in California. It was collected by myself on Wandsworth Common, near London, in 1851, and, subsequently, elsewhere in England by other botanists, but it does not appear to have

become permanently naturalized as an English plant. Neither does it seem to have spread in the Atlantic States, nor to have reached Canada.

Indica appears to have been the first specific name, coupled with the generic term *Melilotus*, applied to this plant, for the publications of Allioni, who gave it, extended (so far as can be ascertained,) only from 1755 to 1789; but I have at present no means of reference to Allioni's works, published at Turin and Paris. Desfontaines' name, *parviflora*, under which this plant has more generally passed, was not published till the year 1799. The *Trifolium parviflorum* of Ehrhart is a totally different plant, a true *Trifolium*, the *T. strictum*, of Linnæus.—See Schrader's N. Journal, II., p. 112 (1808.)

Melilotus Indica. Allioni. Bentham in Mart. Fl. Bras. Smith in Rees' Cyclopædia.

Trifolium Melilotus Indica d. Linn. Species Plantarum, p. 1077. Roxburgh, Fl. Indica, III., p. 388; in E. I. C. Museum, tab. 411.

M. parviflora. Desfontaine, Fl. Atl., II., p. 192. Seringe in DeCandolle's Prodromus, II., p. 187. Hook., Comp., Bot. Mag. I., p. 22. Lawson, Proc. Bot. Soc. Edin., 1851. Torr & Gray, Fl. N. Am., I., p. 321. Gray, Pl., Fendl., p. 33, Pl. Wright, II., p. 41. Brewer & Watson, Bot., Calif., I., p. 132. Wallich, List of E. Ind. Plants, No. 5943. Wight & Arnott, Prod. Fl., Pen. Ind. Orient., p. 196. Hemsley, in Botany of Bermuda, Challenger Report, Bot., I. p. 29 (1885).

M. occidentalis. Nuttall in Torr. & Gr. Fl. N. Am., I. p. 321.

M. minima. Roth, Novæ Species præsertim Indiæ Orientalis, p. 361. De Candolle, Prod., II., p. 189. Sprengel, Syst. Veg., III., p. 208.

The following is a List of the Species and Varieties of *Melilotus*, as described in 1825 by Seringe, the monographer of this genus in De Candolle's Prodromus, Part II., pp. 186-189. It will show the distribution of the several species as known at that time, before railroads and ocean steamships had influenced their

spread over the world. A few additional species have been subsequently described in the Annales des Sciences Naturelles, and other works, and modifications and corrections have been made in the nomenclature, in several instances; but I have limited the list, and retained the names strictly as given in the Prodromus:

Section 1. *Cœlorutis*:

1. *M. Kochiana.* Willd. Enumeratio Plantarum. Hort. Bot. Berolinensis, p. 790. (1809.) Germany and France.

2. *M. dentata.* Ibid. Hungary.

Var. *b. angustfolia.* Wallroth, Schedulæ Criticæ Fl. Halens., I., p. 394. (1822).

3. *M. linearis.* Cavanilles (ex Persoon, Synops., II. p. 348, 1807). Spain.

4. M. *Ruthenica.* Bieberstein, Flora Taurica-Caucasica, p. 506, in note. (1808.) Sarepta, Syria.

5. *M. melanosperma.* Besser MS. (1824) in De Cand. Prod. (1825). Crimea.

6. *M. officinalis.* Willd. Enum., p. 790. (1809.) Europe.

Var. *b. unguiculata.* Seringe in DC. Prod. II., p. 187 (1825). Berne and Geneva.

7. *M. palustris.* Kitabel MS. (1815) in DC. Prod., II., p. 187 (1825). Hungary.

8. ? *M. arborea.* Castagne MS. in DC. Prod., II., p. 187 (1825). Cultivated around Constantinople.

9. *M. altissima.* Thuillier, Flore des environs de Paris, ed. 2, pp. 378 and 83. (1799). Paris.

10. *M. leucantha.* Koch, in DeCandolle's Flore Francaise, ed. 3, V., p. 564. (1815.) Europe.

b. unginculata. Seringe in DC. Prod., Pars II., p. 187 (1825.) Around Berne.

11. *M. macrorhiza.* Persoon, Synopsis, II., p. 348. (1807). Hungary.

12. *M. parviflora.* Desfontaines, Flora Atlantica, II., p. 192. (1799.) Barbary, Italy, France.

13. ? *M. segetalis.* Seringe, in DeCandolle's Prodromus, Pars II., p. 187. (1825.) Estremadura, Spain.

14. *M. Polonica.* Persoon, Synopsis, II., p. 348. (1807.) p. 188. Poland.

15. *M. Taurica.* Seringe in DeCand. Prod., II., p. 188. (1825.) Crimea.

16. *M. Italica.* Lamarck, Encyclopedie Methodique, Botanique, IV., p. 65. (1796.) Italy.

17. *M. gracilis.* DeCandolle, Fl. Française, V., p. 565. (1815.) Southern parts of France.

18. *M. pallida.*—Besser MS. (1824,) in DeCand. Prod., II., p. 188. (1825.) Volhynia, West Russia.

19. ? *M. suaveolens.* Ledebour, Enumeratio Plantarum Hort. Bot. Dorpatensis, Supplement, 1824, p. 5. Near Nertschinsk, Dahuria.

Section 2, *Plagiorutis.*

20. *M. arvensis.* Wallroth. Sched. Crit., p. 391. (1822.) Germany.

Var. *b. albiflora.* Wallroth, l. c., p. 392.

21. *M. elegans.* Salzmann MS. in DeCand. Prod., II., p. 188. (1825.) Corsica.

22. *M. Besseriana.* Seringe MS. in DeCand. Prod., II., p. 188. (1825.) Crimea?

Section 3. *Campylorutis.*

23. *M. Messanensis.* Desfontaines, Fl., Atl., II., p. 193. (1799.) Barbary, Sicily, Piedmont, Straits of Messina. Said to be the Lotos of the Greeks; Lotus of the Romans, Virgil Georgies, B. I., 84 B. III., 394.

24. *M. sulcata.* Desfontaines, l. c. (1799.) Algiers. Alexandria.

Var. *b. Libanotica.* Seringe, in DC Prod., II., p. 189. (1825.) Mount Lebanon.

SPECIES IMPERFECTLY KNOWN.

25. *M. Baumetti.* Hornemann, Hortus Reg. Bot. Hafniensis Supp., p. 84. (1819.) Native country unknown.

26. *M. minima.* Roth, Novæ Species Plantarum, p. 361. India.

27. *M. Neapolitana.* Tenore, Prod. Supp., I., p. 66. Catalogue, 1819, p. 57. Near Naples.