



THE JAMES FLETCHER MEMORIAL FOUNTAIN.

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UNVEILING OF THE JAMES FLETCHER MEMORIAL FOUNTAIN.*

The unveiling of the James Fletcher Memorial Fountain took place at the Central Experimental Farm, Ottawa, on Tuesday afternoon, the 19th July, 1910, at the hour of 4.30 p.m. The ceremony was a complete success in every way. Several hundreds of people came out from the city, and some distinguished visitors from a distance were also present. The Ottawa Field Naturalists' Club, under whose auspices the Fountain was erected, was largely represented from its local membership. Official representatives from the Royal Society of Canada and the Entomological Society of Ontario were also present, and took a prominent part in the proceedings.

Before introducing the speakers, Mr. E. R. Cameron, K. C., the Chairman of the Fletcher Memorial Committee, outlined briefly the steps that led to the erection of the Fountain, instancing facts in regard to the work of the Committee, the soliciting of subscriptions and the decision, after the most careful enquiry and consideration, to place the work of the memorial in the hands of Dr. R. Tait McKenzie, of the University of Pennsylvania, Philadelphia, U. S., an artist of wide repute who has won a high place in the salons of London and Paris for his work in bronzes.

The Honourable Sydney A. Fisher, Minister of Agriculture, who unveiled the Memorial Fountain, spoke in the very highest of terms of the late Dr. Fletcher and his work for Canada. He referred to his early associations with him, and in a charming manner described how the personal friendship which began many years ago continued up to the time of his death. He said that Dr. Fletcher was one of the first, if not the very first person, to welcome him to Ottawa on his election as a Member of Parliament. He then went on to speak of his relations with him as Minister of Agriculture. Dr. Fletcher, he said, represented the ideal type of a public servant. The work which he did throughout the whole of Canada was of the greatest benefit to the country at large. Entirely forgetting himself in every way, he gave up his whole time to the work in

*From the Ottawa Naturalist, August, 1910,

which he was placed in charge, as Entomologist and Botanist of the Dominion Experimental Farms. He was a very hard worker and one who never spared himself. There was no doubt in his mind that if he (Fletcher) had taken a much-needed rest, some few years ago, he might have been with us and doing his work to-day. His investigations and lecture courses took him to every part of the Dominion, and the experience he thus gained respecting agricultural conditions was of extreme value to him in his work. His whole thought was to benefit Canadian agriculture, and the wide reputation he made, not only in his own country, but throughout practically the whole world where economic problems in agriculture are studied, will last as long as time itself. Of a genial and enthusiastic temperament, he made friends wherever he went, and his name to-day is known in every part of Canada where agriculture is practiced. His delightful personality brought him in close touch with farmers, horticulturists and others, and his talks and lectures on insects and plants were always eagerly listened to.

Dr. Bethune, Professor of Entomology at the Ontario Agricultural College, Guelph, expressed his gratification at seeing so many young people present to do honour to the memory of the late Dr. Fletcher, who was so deeply interested in children of all ages and so ready at all times to help and instruct them. He said that he came as a representative of the Ontario Agricultural College, where Dr. Fletcher was always a most welcome visitor. Whenever it was announced that he was to give an address at the College, the hall was sure to be thronged with both young men and women who were eager to hear him. He also represented the Entomological Society of Ontario, of which Dr. Fletcher had been a very active member for a great number of years. On the appointment of Dr. Saunders to be director of the Experimental Farms he was obliged to give up his active co-operation in the work of the Society, and happily his place was very satisfactorily filled by our lamented friend. For nearly thirty years he was a member of the Council of the Society and did a very great deal to advance its interests in various directions.

The speaker then went on to describe his own intimate friendship with Dr. Fletcher and his admiration for his ability as an entomologist, and in other respects as well. While we could not regard him as a man prominent for discoveries in science, while we did not exalt him to the same position as a Darwin, a Huxley or an Agassiz, still he had a very scientific capacity for discerning minute distinctions in the objects of his study, and with his wonderfully retentive memory was able to do a great

deal of most valuable work. We do not, therefore, erect this memorial as a tribute to his scientific attainments, but rather as a token of our love for the man himself and the devoted affection in which we all held him. While he was widely known and respected all over the country, and was regretted as a true friend of a great variety of people, there was another side to his character which was not so generally known: he had a very deep sense of religion and was a man of unobtrusive piety which only revealed itself to those who were on the most intimate terms with him.

Dr. Bethune then read a letter from Dr. L. O. Howard, Chief of the Bureau of Entomology, Washington, and therefore considered to be at the head of the entomologists of North America. He wrote as follows: "I regret more than I can tell that I am unable to come to Ottawa for the unveiling of the memorial. Dr. Fletcher was one of my dearest friends and I had the greatest admiration for him. His services to Canada were very great. He had a wonderful capacity in a very broad field in entomology, and was one of the best-informed men of his time on the intricate and manifold aspects of economic entomology. His reports were sound and practical, and as a public speaker before assemblages of farmers and gardeners he was unexcelled. He was known and admired, and loved also, throughout the United States. In fact, I have never known a man who had so many absolutely devoted friends as Dr. Fletcher. His energy, his enthusiasm, his absorbing interest in everything that lives and grows, his warm heart, his perfect lack of even a suspicion of egotism, attracted everyone who knew him and bound them to him in friendship, and even love, forever."

Dr. Wm. Saunders, C. M. G., Director of the Dominion Experimental Farms, spoke very feelingly of his long association with Dr. Fletcher, which commenced before his appointment on the staff of the Experimental Farms. The value of his work as Entomologist and Botanist to the farmers of the Dominion was very great, and he has been much missed. At meetings of farmers and fruit-growers his clear statements regarding subjects under discussion made his presence a great benefit. He was blessed with a childlike optimism and cheerfulness of spirit which made his society always welcome, and instances of his wide and kind sympathy can be recalled by all who had the privilege of his acquaintance. Dr. Saunders said he had hoped to enjoy his co-operation in the work of the Experimental Farms as long as he held the office of Director. An all-wise Providence decreed otherwise, however; but although deprived

of his society and help, he would always look back to the pleasant intercourse of the years they spent together. Such a life as his was will be a lasting influence for good. Having by this memorial striven to show our appreciation of our late friend's character and work, we may honour him still further by endeavoring to maintain and advance those sciences to the promotion of which so much of his life was so enthusiastically devoted.

Dr. W. D. LeSueur, Hon. Secretary of the Royal Society, in paying his tribute to the late Dr. Fletcher, said that the ceremony in which we are engaging to-day, the duty we are fulfilling towards the memory of our departed and deeply-lamented friend, is one in which the Royal Society of Canada may very fittingly take a part. It was early in the history of the Society—at its third annual meeting in the year 1885—that the name of James Fletcher was enrolled in its list of members. His zeal and his attainments as a practical botanist and entomologist had already attracted the attention of the leading men of Section IV., the Section devoted to the biological sciences; and they gave him a warm welcome to their ranks. It is almost needless to add that he did not regard his election in the light of an idle decoration; he saw in it rather a call to work and duty, and he took at once an active part in the labours of his Section, of which nine years later he was elected President. The address which he delivered in that capacity dealt with the subject of practical entomology. The turn of his mind was at all times practical. He was one of those men who see things to do, and who do them. He was not a man to undervalue or depreciate scientific theory, but his talent lay rather in the region of the visible and tangible. The living, breathing world was his domain. He had the quick eye, the retentive memory, and, above all, the responsive, sympathetic heart.

In the year 1901 we find him reading a paper before the Society on "The Value of Nature-Study in Education." This was a subject after his own heart. He could not understand education apart from nature-study.

His executive abilities were quickly recognized, and for many years he filled most efficiently the office of Honorary Treasurer. In the year 1906, he succeeded Dr. S. E. Dawson, then elected vice-president, in the more difficult and laborious office of Honorary Secretary. Here his talents of industry, tact and management found abundant exercise. The office had previously been held but by two individuals, Sir John Bourinot for the first twenty years of the Society's existence (1882-1902), and Dr.

Dawson for the four succeeding years. These were the distinguished predecessors in whose steps he had to walk; and it was agreed by all that, in his hands, the best traditions of the office were fully maintained. He worked while it was day faithfully and well. Feeling testimony is borne to his services and character in the Proceedings of the Royal Society of Canada of last year; and in the galaxy of noble men whom that Society has lost, the name of James Fletcher shines, and will shine, with a radiance all its own.

Mr. R. B. Whyte spoke on behalf of the Ottawa Field-Naturalists' Club. He told of the early days in the history of the society and of the keen interest which Dr. Fletcher, who had been worthily styled its "father," always had in its welfare. When the Club was organized in 1879, about 40 gentlemen joined its ranks, largely through Dr. Fletcher's influence. No one at that time ever expected the Club to develop in the remarkable way it has done and to do the great amount of work it has since accomplished. From that year until his death, during which period the membership has increased to over 300, he was at all times the chief mainstay, so to speak, of its varied branches of work. As a field-naturalist, there was probably no one in America who was his equal. He had a deep love for boys and girls, and many well-known naturalists in Canada to-day owe their early interest in plants and animals to him. At the excursions of the Club he was always the leading centre of attraction. Everyone wanted to go with Dr. Fletcher through the woods and into the meadows and get from him some of his enthusiasm and knowledge about the forms of life which occurred everywhere.

Mr. Frank T. Shutt, Chief Chemist of the Dominion Experimental Farms, said that to those who knew James Fletcher personally no monument in stone or bronze is needed to keep his memory green. The charm of the true, kindly, cultured gentleman which we all felt when in his company will not readily be forgotten. But we have done well in the erection of this Fountain, a tribute to his memory—a tribute, as has been happily expressed upon the stone, of affection from his friends, that may speak to those who come after of the love and the admiration we had for him; to tell them that James Fletcher was a man who did much good in his day and generation. His work was of incalculable benefit to the farmer and fruit-grower of this country in combating weed, fungus and injurious insect. Probably of even more value, however, was his inspiring enthusiasm, that power to awaken in others an interest in the study of animate

nature. And in this connection we of Ottawa were particularly fortunate. Whether on the excursions of the Field-Naturalists' Club or on the lecture platform of the winter series of lectures, he was the teacher that all listened to with pleasure. We do honour to-day to the memory of a busy man called away in the prime of his life, in the midst of his work. So far as we know he had made no startling or brilliant discovery in the realm of pure science, but that fact—if fact it be—does not in the least detract from the honour that is rightly his. We are rather apt now-a-days to save our applause for those who legitimately or illegitimately can startle us. But Dr. Fletcher was none such. He was a hard worker—but one who looked upon his work as his pleasure—and he was a phenomenal success in that special work to which he devoted his life. He left us a splendid example; may we all try in some measure to follow in his footsteps.

We may all take great satisfaction in knowing that this Fountain, now entrusted to the care of the Experimental Farm and the public, has been erected as a free-will offering by his admirers. In not a single instance was personal canvassing resorted to. We shall rejoice to reflect in the days that are to come that this memorial was the spontaneous tribute of those who knew and loved James Fletcher.

The following letter from Dr. T. J. W. Burgess, Medical Superintendent of the Protestant Hospital for the Insane, Montreal, was read by Mr. Shutt:

"I cannot tell you how sorry I am to be obliged to say that I shall not be able to be present to do honour to dear old James Fletcher. No more lovable man ever breathed. It is one of my proudest boasts that, for over thirty years, I was counted by him on his list of friends. Never had science a more ardent votary than the late Dr. Fletcher. His whole thought was given to it, and not only his personal intimates, but Canada as a whole, should cherish the memory of one who offered up his entire time and energy to her service, making for himself thereby a fame that it will be difficult for anyone to eclipse. As Longfellow says:

'His heart was in his work and the heart
Giveth grace unto every Art.'

Peace to his ashes!

'He rests from his labours, and his works do follow him.' "

FIRST INTERNATIONAL CONGRESS OF ENTOMOLOGY,
BRUSSELS, 1ST TO 6TH AUGUST.

Canada was represented at the above Congress by Mr. Henry H. Lyman, of Montreal, who was present at some of the concluding sessions and at the banquet. The United States had three representatives, Dr. W. J. Holland, Mr. Herbert Osborn and Dr. Henry Skinner. We have just received from Mr. Lyman a copy of the resolutions on Nomenclature which were adopted by the Congress, to be forwarded to the Eighth International Congress of Zoology, which is to be held at Graz, Austria, immediately after the Congress of Entomology.

We publish these resolutions in the original French, and are sure that our readers will be glad to see them at the earliest possible moment.

Ier CONGRES

INTERNATIONAL D'ENTOMOLOGIE.

Bruxelles, 1-6 Août, 1910.

SECTION DE NOMENCLATURE.

1°.—Il est désirable que les règles internationales de la nomenclature zoologique soient suivies également par l'entomologie pour autant qu'elles répondent aux nécessités de cette science.

2°.—Il est désirable que les descriptions soient, autant que possible, accompagnées par des figures.

3°.—Les noms des auteurs doivent être écrits, autant que possible, en entier. Le Comité de nomenclature entomologique est chargé de dresser, pour le prochain congrès, une liste des abréviations des noms d'auteurs.

4°.—Les descriptions qui ne sont publiées que dans les catalogues des marchands et dans les journaux politiques sont à rejeter (sans effet rétroactif).

5°.—Le Comité de nomenclature entomologique est chargé de préparer, pour le prochain congrès une liste des noms de genres, espèces et variétés, dont il est désirable de corriger l'orthographe.

6°.—Il est hautement désirable que les publications entomologiques portent la date précise de leur publication. Le Comité international permanent est chargé de faire connaître cette résolution du Congrès à tous les rédacteurs et éditeurs de publications entomologiques.

7°.—L'Entomologie adopte la loi de priorité sans exception pour les noms de genres, d'espèces et de variétés. Le point de départ de la nomenclature est la Xme édition du "Systema Naturæ" de Linné (1758).

8°.—La section de nomenclature du Ier Congrès international d'Entomologie considère comme étant de la plus grande importance qu'une disposition nouvelle soit ajoutée aux règles internationales de la nomenclature zoologique, à moins que,* lors de la description d'une espèce ou d'une variété nouvelle, un exemplaire seulement soit étiqueté comme "type," les autres exemplaires examinés en même temps par l'auteur, comme "cotypes."

TRANSLATION OF ABOVE.

FIRST INTERNATIONAL
CONGRESS OF ENTOMOLOGY,
Brussels, 1-6 Aug., 1910.

NOMENCLATURE SECTION.

I.—It is desirable that the international rules of zoological nomenclature be followed equally by entomology as far as they are adapted to the requirements of this science.

II.—It is desirable that descriptions be, as far as possible, accompanied by figures.

III.—The names of authors ought to be written, as far as possible, in full. The Committee on Entomological Nomenclature is instructed to draw up, for the next Congress, a list of abbreviations of authors' names.

IV.—Descriptions which are published only in dealers' catalogues and in newspapers are to be disregarded (without retroactive effect).

V.—The Committee on Entomological Nomenclature is instructed to prepare, for the next Congress, a list of names of genera, species and varieties, whose orthography it is desirable to correct.

VI.—It is highly desirable that entomological publications bear the exact date of their publication. The permanent international committee is instructed to make known this resolution of the Congress to all the publishers and editors of entomological publications.

VII.—Entomology adopts the law of priority, without exception, for the names of genera, species and varieties. The starting point of nomenclature is the 10th edition of "Systema Naturæ" of Linnæus (1758).

VIII.—The nomenclature section of the first International Congress of Entomology considers as being of the greatest importance, that a new clause be added to the international rules of zoological nomenclature, providing that, at the time of description of a new species or new variety, one example only should be labelled as "type," the other examples examined by the author at the same time as "co-types."

* There seems to be an error here. The English translation, which follows, gives the meaning which the sentence was apparently intended to convey.

THE ORTHOPTERA OF WESTERN CANADA.

BY THE EDITOR.

(Continued from page 276.)

Since the first part of the present paper appeared, Mr. Caudell has kindly called my attention to the omission from the list of references of his paper, "Notes on some Orthoptera from British Columbia" (Ent. News, 1904, pp. 62, 63). From this paper, which will be cited as "Caudell," the only additional records to be made to those already published in the present list are the following from Kaslo, B. C.: *Blattella germanica*, *Tetrix granulatus*, *T. Brunneri* and *T. crassus*.

Subfamily CEdipodinae.

29. *Arphia frigida* (Scudd.).

MAN.—Aweme, June 21, 1903, 1 ♀, yellow-winged. (Fletcher.)

SASK.—(a) Yellow-winged (*frigida*): Saskatoon, June 1, 1906,

1 ♀. (Willing.) (b) Red-winged (*arcta*): Alameda, May 30,

1901, 1 ♂; July 5, 1902, 1 ♀. Banff, July 7, 1907.

Estevan, July 8, 1902, 2 ♀'s. Ft. Qu'Appelle, June 17, 1901,

1 ♂; Medicine Hat, May 30, 1904, 3 ♂'s, 5 ♀'s; Oct. 1,

1903, 1 ♀ nymph. Oxboro', May 29, 1901, 1 ♂, 1 ♀.

Radisson, June 30, 1907, 1 ♀; July 29, 1907, 1 ♀. Regina,

May 31, 1909, 1 ♂; June 20, 1903, 1 ♀; July 5, 1903, 1 ♀.

Saltcoats, July 12 and 13, 1902, 1 ♂, 1 ♀. Saskatoon, June

20, 1902, 2 ♂'s, 1 ♀. (Willing.) Also recorded from Wood

End (Scudder*), Rudy (Fletcher³ and Rehn), and Radisson

(Rehn).

ALTA.—(a) Yellow winged: Banff, back of Tunnel Mt., July 1,

1908, 1 ♂, 1 ♀. The Race-track, Banff July 1, 1909, 1 ♂.

Also 2 ♂'s, 3 ♀'s from Banff without dates. (Sanson.)

(b) Red-winged: Banff, back of Tunnel Mt., June 25, 1908,

1 ♀. Also 3 ♂'s, 2 ♀'s from Banff without dates. (Sanson.)

Nymphs: Banff, May 28, 1908, 3 spec.; July 21, 1909, 1 spec.

Also recorded from Banff as *A. teporata* (Fletcher³).

In the large series from Saskatchewan the wings vary from yellow, through deep orange to deep vermilion. The red colour is only rarely as deep a shade as in *A. pseudonietana*. The yellow sutural stripe of the tegmina is present in only three

*Sm all numerals following an authority's name refer to same numerals in the list of references.

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examples in this series, though present in all the Banff specimens. Great variation in general coloration, distinctness of spots of tegmina, etc., are observable in the series.

30. *Arphia pseudonietana* (Thomas).

MAN.—Aweme, Aug. 30, 1907, 1 ♀; Sept. 15, 1907, 1 ♀. (Criddle.) Also recorded from the Souris River (Scudder²), Brandon, the vicinity of Souris and Boissevain, and between Carberry and Neepawa (Walker).

SASK.—Medicine Hat, Oct. 1, 1903, 1 ♂ (Willing); 1 ♂, 2 ♀'s, 1 nymph (Alexander). Moose Jaw, Sept. 28, 1906, 1 ♀. Regina, Sept. 17, 1909, 1 ♂; Sept. 13, 1908, 1 ♀. Swift Current, Sept. 17, 1 ♀. Walsh, Aug. 23, 1901, 6 ♂'s, 6 ♀'s. (Willing.) Yellow Grass, 3 ♂'s, 1 ♀. (Alexander.) Also recorded from Regina (Caulfield), Moose Jaw (Caudell^{1, 2}, Walker), Medicine Hat (Caudell²), Herbert, Gull Lake and Maple Creek (Walker).

ALTA.—Banff, back of Tunnel Mt., Oct. 3, 1908, 1 young ♀ nymph. (Sanson.) Also recorded from Calgary. (Caudell²)

B. C.—Recorded from Vernon (Fletcher², Walker), Victoria (Fletcher¹, Walker), Vancouver (Saussure, Prod. Céd., 68, 1884).

31. *Chortophaga viridifasciata* (DeGeer).

SASK.—Maple Creek, July 12, 1907, 1 green ♀. (Willing.) Also recorded from Moose Jaw. (Caudell¹)

The extensive variation characteristic of this species is well shown in the series.

32. *Encoptolophus parvus* Scudd.

MAN.—Aweme, Sept. 6, 1907, 1 ♂; Sept. 14, 1909, 1 ♀. (Criddle.)

SASK.—Pasqua, 1 ♀. Yellow Grass, 1 ♀. (Alexander.) Walsh, Aug. 23, 1901, 4 ♂'s, 12 ♀'s. Regina, Sept. 19, 1903, 1 ♀; Sept. 13, 1908, 1 ♀. (Willing.) Also recorded from Moose Jaw (Caudell^{1, 2}), and from near Waldeck, Swift Current and Pasqua (Walker).

Both of the Manitoba specimens, two of the females from Walsh and the two from Regina are green, the others brown.

33. *Camnula pellucida* (Scudd.).

MAN.—Aweme, July 27, 1903, 1 ♂; Aug. 12, 1905, 1 ♂. (Criddle.) Deloraine, June 15, 1899, 1 ♀. (Fletcher.) Also recorded from Portage la Prairie, Plum Coulee and Brandon. (Walker.)

SASK.—Regina, Aug. 29, 1909, 1 ♀; Aug. 31, 1901, 1 ♂, 1 ♀; Sept. 5, 1909, 1 ♀; Sept. 19, 1903, 1 ♂; Sept. 23, 1906, 1 ♀. Walsh, Aug. 23, 1901, 1 ♂. (Willing.) Also recorded from Indian Head (Walker), and Radisson (Rehn).

ALTA.—Ponoka, 1 ♂. (Alexander.) Edmonton, July, 1904. (Willing.) Banff, Aug. 16, 1909. (Sanson.) Also recorded from Macleod (Bruner, Bull. Div. Ent. U. S. Dept. Agr., 11, 15, 1883); Canmore and Kananaskis (Walker), and Calgary (Caudell⁴).

B. C.—Nelson, 1 ♂, 1 ♀. Victoria, 2 ♀'s. (Alexander.) Vernon, July 26, 1895, 1 ♂, 1 ♀. (Fletcher.) Also recorded from Discovery Bay, Vancouver Id. (Walker), Kaslo (Caudell⁴), and Beavermouth (Rehn).

34. *Hippiscus tuberculatus* (Pal. de B.).

MAN.—Aweme, June 16, 1904, 1 ♂; July 1, 1909, 1 ♂. (Criddle.) Also recorded from Dufferin (Scudder³), and the Red River (Scudder³).

SASK.—Alameda, May 30, 1901, 1 ♀. Billings' Mill, July 12, 1903, 1 ♀. Boucher, first half of July. (Courbeaux.) Regina, Sept., 1 ♂ nymph. Tacomba, April 30, 1903, 1 ♂ nymph. Also two females without locality. Also recorded from Kinistino. (Rehn.)

ALTA.—Red Deer, 11 nymphs. (Alexander.) Also recorded from Calgary. (Scudder³)

As compared with female specimens from Southern Ontario, those from Saskatchewan are distinctly larger, the tegmina measuring from 31.5 to 36.5 mm., the hind femora 19 to 21.5 mm., while in Ontario specimens the tegmina vary from 28 to 32.5 mm., and the hind femora from 18.7 to 19.5 mm. The spots of the tegmina are better defined, the fuscous band of the wings darker, and the disk of the latter vermilion instead of a dull rose-red.

35. *Hippiscus neglectus* (Thomas).

MAN.—Aweme, July 14, 1904, 2 ♀'s. (Criddle.) Also recorded from the same locality by Rehn.

ALTA.—Macleod. (Scudder³)

B. C.—Nelson, 1 ♀. (Alexander.)

36. *Hippiscus obscurus* Scudd.

B. C.—Recorded from this Province by Scudder² and from Vernon, as *H. Californicus*, Walker.

The specimens from Vernon exhibit two types of coloration. In one the markings are distinct, as in *H. neglectus*, in the other they are obscured with brown and the tegmina are without the yellow sutural stripe. As these specimens show no structural differences and were all taken together, there can hardly be a doubt that they belong to the same species. The distinctly-marked individuals are scarcely separable from *H. neglectus*, and I doubt very much if they are specifically, or even racially, distinct from that species.

37. *Hippiscus zapotecus* Saussure.

MAN.—Aweme, July 10, 1907, 1 ♀. (Criddle.) Also recorded from Mill Valley. (Walker.)

SASK.—Rudy. (Rehn.)

38. *Hippiscus tigrinus* Scudd.

MAN.—Aweme, June 24, 1909, 1 male; June 2, 3, 1904, 2 females (determined by Scudder). Also recorded from the same locality by Fletcher.²

SASK.—Dubuc, May 30, 1907, 1 ♂. Indian Head, July 22, 1903, 1 ♀ (yellow-winged); April, 1905, 1 ♂ nymph. Maple Creek, Aug. 2, 1902, 1 ♀ (yellow-winged). Medicine Hat, May, 30, 1901, 1 ♀ (red-winged); May 30, 1904, 2 ♂'s, 2 ♀'s (yellow-winged), 2 ♂'s, 1 ♀ (red-winged). Meota, July 8, 1906, 1 ♂, 1 ♀. Pincher, June 24, 1902, 1 ♀ (yellow-winged). Radisson, July 20, 1907. Regina, Aug. 11, 1904, 1 ♀ (reg-winged). North of Swift Current, May, 1907 (col. Dr. Charlton), 1 ♀ (red-winged). East of Weyburn, June 19, 1901, 1 ♀ (red-winged).

I have included under *H. tigrinus* many specimens which do not agree with Scudder's description in all respects. In fact, I find it impossible to separate *H. latefasciatus*, *tigrinus* and *zapotecus* by the characters given by Scudder. The course of the intercalary vein, the development of the tubercles of the pronotum, the width of the fuscous band of the wings and the extent of the maculation of the tegmina are all very variable characters. As, however, I have seen but few authentically determined specimens of these three forms, I make as yet no

positive statements as to their status, but I believe that time and extensive collecting will show them all to belong to one and the same species.

The wings in the Saskatchewan series are either sulphur-yellow or rose-red, no intergrades having been seen.

39. *Hippiscus latefasciatus* Scudd.

MAN.—Aweme, June 19, 1903, 1 ♀. Also recorded from this locality by Rehn and Fletcher,² and from the Red River by Scudder.³

ALTA.—Calgary, May, 1907, 1 ♂. (Sanson.) Also recorded from this locality by Scudder.³

40. *Dissosteira Carolina* (L.).

MAN.—Aweme. (Criddle.)

SASK.—Walsh, Aug. 23, 1901, 2 ♂'s, 2 ♀'s. Medicine Hat, Oct. 1, 1903, 1 ♀. Regina, Oct. 5, 1901, 1 ♀. (Willing.)

B. C.—Recorded from Vernon by Walker and Vancouver Id. by Caudell.²

The Saskatchewan specimens are of larger size than most of those from Ontario.

41. *Spharagemon collare* (Scudd.).

MAN.—Aweme, July 2, 1904, 1 ♂. (Criddle.) July 15, 1904, 1 ♀. (Willing.) Also recorded from Brandon and the vicinity of Souris and Boissevain by Walker.

SASK.—Boucher, July, 1896. (Courbeaux.) Weyburn, 1 ♂. Yellow Grass, 1 ♂. (Alexander.) Also recorded from Chaplin, Moose Jaw, Morse, Parkbeg and Rush Lake by Walker, and Regina by Caulfield.

ALTA.—Macleod, 1 ♂, 2 ♀'s.

This species varies very much in the height of the pronotum and in coloration. The male from Aweme is nearly uniform reddish-brown, with the tegmina indistinctly banded, the general appearance recalling *S. Bolli*. Of the two females from Macleod, one is rusty-brown, the other colored and rather short-winged.

42. *Spharagemon æquale* (Say).

SASK.—Walsh, Aug. 23, 1901, 1 ♂. Medicine Hat, Oct. 1, 1903, 2 ♂'s. (Willing.) 1 ♂, 1 ♀. (Alexander.) Recorded from Medicine Hat also by Caudell.²

- ALTA.—Calgary. (Caudell.²)
 B. C.—Kamloops, 1 ♀. (Alexander.)
43. *Spharagemon Bolli* Scudd.
 MAN.—Aweme, July 27, 1904, 1 ♀, moderate sized. (Criddle.)
 Also recorded from the same locality by Fletcher.²
44. *Metator pardalinum* (Sauss.).
 SASK.—Regina, Sept. 19, 1903, 1 ♂ (ye'low-winged). Walsh,
 Aug. 23, 1901, 1 ♂, 1 ♀ (yellow-winged), 1 ♂, 1 ♀ (red-
 winged). (Willing.) Also recorded from near Walleck by
 Walker.
 ALTA.—Macleod, 1 ♀ (yel'ow-winged). (Alexander.)
45. *Trachyrhachis Kiowa* (Thom.).
 MAN.—Aweme, Aug. 24, 1904, 1 ♂. (Criddle.) Also recorded
 from the vicinity of Souris and Boissevain and near Brandon
 by Walker.
 SASK.—Medicine Hat, 1 ♂, 1 ♀. Yellow Grass, 1 ♀.
 (Alexander) Walsh, Aug. 23, 1901, 2 ♂'s, 2 ♀'s. (Willing.)
 Also recorded from Indian Head, Moose Jaw and Morse by
 Walker, and Moose Jaw by Caudell.^{1, 2}
 ALTA.—Calgary. (Caudell.²)
46. *Conozoa wallula* (Scudd.).
 B. C.—Kamloops, 2 ♂'s, 2 ♀'s. (Alexander.) Also recorded
 from Vernon by Scudder.
 The specimens from Kamloops are distinctly smaller than
 those from Vernon, but are otherwise identical.
47. *Trimerotropis caruleipes* Bruner.
 B. C.—Recorded from Nanaimo, Duncan's and Discovery Id.,
 Vancouver Id., by Walker, and Wellington and Nanaimo by
 Caudell.²
48. *Trimerotropis agrestis* McNeill.
 MAN.—Aweme, Aug. 14, 1900, 1 ♀; Sept. 3, 1903, 1 ♂, 1 ♀;
 Sept. 15, 1907, 1 ♀. (Criddle.) Also recorded from the same
 locality by Fletcher.³
49. *Trimerotropis citrina* Scudd.
 MAN.—Scudder (Bull. U. S. Geol. Surv. Terr., II, 265, 1876).
 ALTA.—Calgary. (Caudell.²)
 B. C.—Vernon. (Fletcher.²)

50. *Trimerotropis Bruneri* McNeill.
SASK.—Medicine Hat, 2 ♂'s. (Alexander.) Swift Current, Aug. 5, 1901, 1 ♀; Sept., 1 ♂. (Willing.) Also previously recorded from Swift Current by Walker.
51. *Trimerotropis monticola* Saussure.
SASK.—Findlater, 1 ♂. Medicine Hat, 1 ♂. Weyburn, 1 ♂. Yellow Grass, 2 ♀'s. (Alexander.) Pincher, July 28, 1901, 1 ♀. Swift Current, Aug. 5, 1901, 1 ♂, 1 ♀. (Willing.) Also recorded from Gull Lake, Moose Jaw, Morse and near Waldeck by Walker, and Radisson by Rehn.
ALTA.—Macleod, 2 ♀'s. (Alexander.) Also recorded from Calgary by Caudell.²
B. C.—Vernon. (Walker.)
52. *Trimerotropis latifasciata* Scudd.
ALTA.—Macleod, 1 ♀. (Alexander.)
Mr. Caudell and the writer compared together the specimens of *T. latifasciata* and *T. laticincta* Sauss., in the U. S. National Museum, and found no constant distinctive characters. The latter name must fall under the synonymy of the former.
53. *Trimerotropis vinculata* Scudd.
B. C.—Ashcroft, June 15, 1905, 2 ♂'s, 1 ♀; June 5, 1 ♂. (Rev. W. M. Roger.) Savonar, 2 ♂'s. Greenwood, 1 ♂. Kamloops, 3 ♂'s. (Alexander.) Also recorded from Revelstoke, Vernon and Agassiz by Walker, and Victoria by Fletcher.³
Two of the Kamloops specimens are much smaller than the others.
54. *Trimerotropis vinculata similis* (Scudder).
ALTA.—Calgary. (Caudell.²)
55. *Trimerotropis longicornis* Walk.
B. C.—Vernon. (Walker.)
56. *Trimerotropis sordida* Walk.
SASK.—Walsh, Aug. 23, 1901, 1 ♀. (Willing.) Also recorded from Morse, Moose Jaw and near Waldeck by Walker.
57. *Trimerotropis* ? sp.
B. C.—Kamloops, 1 female. (Alexander.)
This is a peculiar specimen, having the median carina of the pronotum and the colour pattern like *Spharagemon æquale*,

but with the small head and general proportions of a *Trimerotropis*. It was submitted to Mr. Caudell, who expressed his belief that it was a *Trimerotropis*, but found it unlike any species in the U. S. National Museum. It seems not impossible that it is a hybrid between some species of *Trimerotropis* and *S. aequale*, which was also taken at Kamloops by Prof. Alexander.

58. *Circotettix verruculatus* (Kirby).
 MAN.—Recorded from Dufferin by Scudder,² and Winnipeg by Scudder.¹
 ALTA.—Banff, Aug. 6, 12, 1909, 2 ♀'s; Sept. 4, 1908, 1 ♂. (Sanson.)
 B. C.—Vancouver. (Scudder, Appal., VIII, 308, 1898) Kaslo (Caudell⁴).
59. *Circotettix suffusus* (Scudder).
 B. C.—Cranbrook, 8 ♂'s, 3 ♀'s. Greenwood, 1 ♂, 1 ♀. Kamloops, 1 ♂. Kitchener, 2 ♂'s. Nelson, 4 ♂'s, 2 ♀'s. (Alexander.) Also recorded from Donald, Revelstoke, Rossland, Robson, Vernon, Agassiz, Discovery Id. by Walker, Kaslo by Caudell⁴, and Beavermouth and Field by Rehn.
60. *Circotettix undulatus* (Thomas).
 MAN.—Aweme, Sept 1, 1907, 1 ♂. (Criddle.)
 SASK.—Cowley, July 29, 1901, 1 female. Medicine Hat, Oct. 1, 1903, 1 female. (Willing.)
 B. C.—Victoria. (Fletcher¹).
61. *Circotettix lobatus* Sauss.
 B. C.—Vernon. (Walker.)
62. *Circotettix carlinianus* (Thomas).
 SASK.—Maple Creek, Aug. 2, 1902, 1 female. (Willing.) Also recorded from Pasqua by Walker.
 ALTA.—Macleod. (Bruner, Bull. Div. Ent. U. S. Dep. Agr., II, 13, 1883).
 B. C.—Vancouver Id. (Scudder.⁶)
63. *Hadrotettix trifasciatus* (Say).
 SASK.—Medicine Hat, Oct. 1, 1903, 1 female. (Willing.) Also recorded from Wood End. (Scudder.²)
 (To be continued.)

SOME NEW WESTERN THAMNOTETIX (HOMOPTERA).

BY E. D. BALL, EXP. STATION, LOGAN, UTAH.

(Continued from p. 268.)

Thamnotettix vespertina, n. sp.

Resembling *vastula*, slightly stouter. Smaller, narrower and darker than *atridorsum*. Green, with a faint smoky tip to elytra. Length, 5 mm.

Vertex slightly obtusely angulate, not quite twice wider than long, almost as long as the pronotum. Disc slightly convex, anterior margin broadly rounding to the front. Front as wide as long, distinctly narrowing below. Elytra broad and moderately short, appressed posteriorly.

Colour: Vertex straw-colour, with traces of smoky at the apex and on the reflex portion of front. Face and below deep smoky, with irregular areas on clypeus, and genæ paler and short arc on the front light. The genital segments in both sexes straw-coloured. Pronotum and elytra green, the apical cells of the latter slightly smoky.

Genitalia: Female segment two-thirds as long as its basal width, almost semicircularly rounding from the base to the slightly roundly emarginate, smoky and elevated apex. Male valve very large, obtusely triangular, plates together, half wider than long, slightly roundly, narrowing to the broad blunt, almost truncate apices, which scarcely equal in length the extraordinarily broad pygofer.

Described from two females and two males from Beaumont, California, collected by the author. The dark face and narrower head, as well as the distinct genitalia, will separate this species from *atridorsum*, while its blunt head will separate it from the preceding species.

Thamnotettix visalia, n. sp.

Resembling *vastula*, somewhat larger and with a slightly shorter vertex. Green, with a trace of smoky on the apical cells. Length, 5.5 mm.

Vertex right angled, half wider than long, disc slightly convex, acutely angled with front, the margins bluntly rounding. Front slightly wider than in *vastula*, distinctly longer than wide. Elytra moderately long.

Colour: Vertex straw-yellow, face and below pale yellow. Pronotum, except the anterior margin, green. Scutellum greenish-yellow. Elytra green, becoming subhyaline beyond the middle and slightly smoky at the apex.

Genitalia: Female segment as long as its basal width, scarcely narrowed posteriorly, the median fourth of posterior margin almost

truncately excavated to one-half the depth of the segment and black-marked at the base. The lateral flaps obliquely truncate from the slightly rounding lateral angle. Male valve obtusely triangular, plates together moderately broad, triangularly narrowing to the blunt tips.

Described from three females from Chino and one pair from Visalia, California, collected by the author. Readily separated from the related species by the very distinct female genitalia.

Thamnotettix atridorsum, var. *vetula*, n. var.

Size and form of *atridorsum* nearly. Slightly shorter and stouter. Pale creamy-yellow above and below, eyes and a small spot on the female segment black. Length, 4.75 mm.

Described from five females from Kelso, California, and one from American Fork, Utah, all collected by the author. This is apparently an adaptation to a very hot, dry condition, and may prove to be a good species when further material is found. It would hardly be advisable to separate it on a single sex, however.

Thamnotettix atridorsum, var. *vesca*, n. var.

Form and colour of *atridorsum* nearly, except that it is smaller and much shorter and stouter, with the elytra scarcely covering the apex of the abdomen, the apical cells abbreviated, broader than long. Green, with the vertex and face pale straw-yellow. Length, 4 mm.

Described from four females and one male from Coronado Beach, Long Beach and Redondo Beach, California, collected by the author. These specimens were all taken along the seashore, on the short vegetation growing just above tide-water, and apparently become adapted to this rigorous condition by reduction in size and especially in wing-length.

Thamnotettix Titusi, var. *vivata*, n. var.

Form and general appearance of *Titusi* nearly, much smaller, shorter and with less markings on the face. The head is slightly broader than in *Titusi*, and the front is broader and fuller. The face is pale and slightly smoky, but never dark as in that species. The elytra are darker at the base, inclined to be bluish, and are slightly smoky at the apex, with the veins usually distinct. In two specimens the veins are light coloured throughout, the pronotum is light margined all around, and there is a transverse smoky marking on the disc of the vertex. Length, 4.5 mm.

Described from eight examples from Tia Juana, Pasadena and Riverside, California, and Reno, Nevada, all collected by the author. This

will very likely prove to be a distinct species when sufficient material is at hand, but with the small amount of widely-scattered material available at present it was thought best to refer it to *Titusi* as a variety.

Thamnotettix gloriosa, n. sp.

Form of *visalia* nearly, larger, longer, golden iridescent-green, with long flaring elytra, slightly smoky tipped. Length, 6 mm.

Vertex slightly obtusely angulate, a little over half wider than long, rounding over to the rather flat, strongly-retreating face. Front slightly longer than in *visalia*, the margins curving in to the clypeus. Elytra very long, inclined to be flaring posteriorly, giving the whole insect a long, parallel margined appearance.

Colour: Vertex straw-yellow, inclined to be tinged with orange in the males; face pale creamy-yellow in the female, lemon-yellow with the genæ lighter in the male, a black dot just outside the loræ. Pronotum a yellowish-green, darker on the disc. Scutellum pale yellowish-green. Elytra yellowish-green on the clavus, corium subhyaline-yellow, with the tawny tergum showing through, giving a golden tinge to the whole elytra, the tip inclined to be smoky-iridescent. Below pale.

Genitalia: Female segment not quite as long as its basal width, the lateral margins parallel, posterior margin with the median third angularly excavated half-way to the base, the excavation slightly narrowing towards the bottom and usually with a slight median projection, the base of the segment below the excavation gibbous, and shining black in colour. Male valve wide, the median half produced into a large triangle, plates rectangular, together almost twice wider than long, transversely convex, their apices curved upward and slightly produced at the suture, apical margins thick and with a subapical row of bristles. Extending slightly below the plates a pair of stout, black hooks are visible. Described from eight examples from Tia Juana, California, collected by the author. Specimens varying slightly in the genitalia of both sexes are at hand from Salinas and Ontario, California.

Thamnotettix gemella, n. sp.

Form and general appearance of *languida* nearly, but much smaller and lacking the black spots. A slender green species, with the margins smoky. Length, female 5 mm.; male 4 mm.

Vertex very obtusely angled, one-fourth longer on middle than against an eye, one-half as long as the basal width, disc convex, broadly

rounding to the flat and strongly-oblique face. Front narrow at base one-half longer than wide. Elytra moderately long, closely folded behind.

Colour: Vertex, face and scutellum creamy-yellow, a black point just outside the loræ. Pronotum and most of the claval areas green. The outer margin of claval areas and the inner half of corium smoky-brown, the costal margin subhyaline.

Genitalia: Female segment slightly wider than long, posterior margin concave, with the lateral angles rounding. Male valve short, bluntly produced, plates together long, acutely triangular, half longer than their basal width, their attenuate apices clothed with numerous long hairs.

Described from ten examples from Ontario, Pasadena and Tia Juana, California, collected by the author. In life there is a metallic-iridescence which heightens the striped appearance of this distinctly-marked species.

Thamnotettix generosa, n. sp.

Size and form of *gemella* nearly, the vertex more pointed. Resembling *gloriosa* in colour. Length, female 5 mm.; male 4 mm.

Vertex right angled, the apex acute, about half wider than long, disc transversely convex, sloping to the slightly rounding margin of the face. Face strongly receding, the apex of vertex and face distinctly conical. Front narrow, wedge-shaped, the margins straight. Elytra long, appressed.

Colour: Vertex and face pale lemon-yellow, a pair of black dots outside the loræ. Pronotum yellowish-green. Elytra pale yellowish-green, shading out to subhyaline towards the costa and apical cells. Some of the males are inclined to be smoky-iridescent, while one female is all pale lemon-yellow.

Genitalia: Female segment two-thirds as long as its basal width, the posterior margin gently convex, the lateral angles broadly rounded. Male valve obtusely angular, plates long, slender, together slightly concavely attenuate, over half longer than their basal width.

Described from ten examples from Colfax and Visalia, California, collected by the author.

Thamnotettix gerula, n. sp.

Form of *generosa* nearly, but larger, as large as *longula*. Greenish-yellow, with a black band covering all the elytra before the appendix. Length, 6 mm.

Vertex slightly obtusely angled, the margins straight, less than one-half wider than long, disc slightly convex. Face flat, acutely angled with

the vertex, the margin bluntly rounding, the apex nearly acute. Front wedge-shaped, less than half longer than wide. Elytra long, closely appressed behind.

Colour: Vertex and face pale lemon-yellow, a black spot outside the loræ on either side. Pronotum green, the margins pale yellow. Scutellum pale yellow. Elytra deep brownish-black back to the apex of clavus, then green to just before the apical cells, which are smoky-subhyaline. The whole elytra iridescent. Legs and below pale.

Genitalia: Female segments two thirds as long as its basal width, gradually narrowing from the base to two-thirds its width. Posterior margin with the median half shallowly angularly excavated and strongly black-marked, the lateral angles rounding. Male valve short, very obtusely triangular, plates together triangular, longer than the basal width, the lateral margins rounding, a black line at the base on either side.

Described from eight examples from Colfax, California, and Medford, Oregon, collected by the author. The broad black saddle in sharp contrast to the yellow-green renders this a strikingly distinct species.

Thamnotettix vapidæ, n. sp.

Size and form of *infuscatæ* nearly. A large mottled-brown species with the vertex lighter. Length, female 6 mm.; male 5.75 mm.

Vertex broad, obtusely angulate, apparently almost rounding, with the apex produced, but slightly longer on the middle than against the eye, nearly twice wider than long, scarcely the length of the pronotum. Front broad, flat, retreating, wedge-shaped, union with vertex narrowly rounding. Elytra long, oftentimes flaring, venation simple, often one or two extra nervures from the outer antepical cell to the costa.

Colour: Vertex straw-yellow, a pair of oblique dashes at the apex, a pair of round spots at base and sometimes a line from the ocelli to the middle of the disc brown. Face pale, the sutures brown, the front smoky with pale curved arcs, the upper bounding pair visible from above on the vertex margin. Pronotum pale, all but the anterior margin finely sprinkled with milky and rusty brown. Elytra milky subhyaline, finely and irregularly irrorate with rusty brown.

Genitalia: Female segment as long as its basal width, narrowing from the base, the posterior margin slightly rounding, with the median half angularly emarginate, the emargination one-half as deep as its width. Male valve transverse, scarcely angled; plates together triangular, scarcely as long as the basal width, gibbous at base, then narrowing to the blunt

spoon-shaped tip. Pygofers enlarged, broader than the plates at base, regularly narrowing to the truncate apex, which considerably exceeds the plates.

Described from ten examples from Tia Juana, Mexico, and Tia Juana, California, collected by the author. This species introduces a new group into this genus as found in America.

Thamnotettix dissimilata, n. sp.

Form of *vapida* nearly, but still longer and more strongly built. Females entirely tawny or mottled-brown; males green, with the head tawny. Length, 7-8 mm.

Vertex as in *vapida* nearly, obtusely angled, with the disc depressed, slightly shorter than the pronotum. Front broad, wedge-shaped, rounding to the clypeus, vertex margin as in *vapida*, almost acute. Elytra broad, much longer than the abdomen; costal margin nearly straight, apical cells only moderately long, usually several supernumerary veinlets from the outer anteapical cells to the costa.

Colour: Female: vertex, pronotum and scutellum pale yellow, often washed with tawny, sometimes with traces of markings on vertex, as in *vapida*, and often with brown mottlings on disc of pronotum. Face light rusty-brown or tawny, the front smoky above with light arcs. Below pale tawny. Elytra milky subhyaline, heavily irrorate with brown or tawny-brown; sometimes the brown is almost solid, and in that case the apical veinlets are light. Male: vertex dirty-yellow, washed or marked with tawny. Face darker than in female, legs and below black. Pronotum green, the anterior margin pale or tawny. Elytra deep green, fading out towards the costa and abruptly terminated just before the apical cells, which are deep smoky.

Genitalia: Female segment two-thirds as long as its basal width, narrowing posteriorly, the posterior margin shallowly, angularly excavated more than half its width, with the angles dark-marked. Male valve broad, short, scarcely angled, plates together rather narrow, roundly narrowing to the rounding apex, two-thirds as long as their basal width. Pygofers broad, inflated, then slightly narrowing to the truncate tips, which extend beyond the plates.

Described from ten specimens from Colfax, California, collected by the author. The large size and difference in colour of the sexes renders this a strikingly distinct species.

Thamnotettix gutturosa, n. sp.

Resembling *dissimilata* female in general appearance, stouter and shorter. Brown, with a short head and numerous supernumerary veinlets on the elytra. Length, male, 6 mm.

Vertex broad, short, almost parallel margined, the apex a trifle advanced, twice wider than long, disc almost flat, the margins broadly rounding to the moderately convex, slightly inclined face. Front slightly produced, as wide or wider across antennæ than at base, then narrowing to the broad truncate apex. Pronotum broad and short, but little longer than the vertex. Elytra broad, inclined to be flaring, veins distinct, venation apparently regular, strong, with a number of supernumerary transverse veinlets along the claval suture and in the anteapical and basal portion of apical cells. In both of these examples a veinlet forms "the second cross nervure," although slightly variable in position.

Colour: Vertex pale yellow, washed with testaceous, traces of a pair of round spots at base and a transverse crescent on the disc. A black spot against either eye in line with the ocelli, a dash beneath each ocellus and another on apex black; these latter being parts of a reflex frontal arc. Face rusty or tawny brown, with frontal arcs and sutures darker, a pair of dark spots above the antennæ. Pronotum cinereous. Elytra cinereous, inclined to be smoky, the veins light, heavily margined with fuscous, especially in the supernumerary cells, which are sometimes entirely fuscous.

Genitalia: Male valve obtusely roundly triangular; plates large, leathery, roundly narrowing, one-third their length, then nearly parallel margined to the broad truncate tips, longer than their basal width and entirely concealing the pygofers, their lower surface sparsely clothed with hairs.

Described from two males from Beaumont, California, collected by the author.

Thamnotettix ursina, n. sp.

Resembling *dissimilata* female in general form and colour, smaller and slightly darker, sexes alike in colour. Length 6 mm.

Vertex definitely obtusely angled, twice wider than long, the disc depressed, the margin broadly rounding to face. Front moderately wide, regularly narrowing to the truncate apex, one-third longer than its basal width. Pronotum longer than the vertex. Elytra long, almost parallel margined, the apical cells rather short. Venation regular, with the outer apical cell rather short and unusually broad. Usually a number of supernumerary veinlets to costa and occasionally a forked apical.

Colour: Vertex tawny, with a darker dash either side the apex in the male. Face rusty brown, the front smoky with light arcs. Pronotum brown or cinereous-brown, the anterior margin lighter. Elytra rich brown, sparsely irrorate with milky white dots, the nervures towards the apex lighter.

Genitalia: Female segment one-half as long as its basal width, the lateral margins slightly narrowing, the posterior margin truncate or very slightly sinuate, the median half dark-marked. Male valve obtusely triangular, plates together triangular, regularly narrowing to the almost truncate tips, concealing the pygofer, but beyond which a pair of sickle-like black hooks extend.

Described from a single pair from Medford, Oregon, collected by the author.

Thamnotettix glomerosa, n. sp.

Resembling *bullata*, but smaller and more slender, with irregular fuscous markings. Length, female, 4.75 mm.

Vertex including the reflexed portion of the swollen front as broad as in *bullata* and much longer, nearly twice as long on middle as against the eye. Vertex without a definite margin, merging into the front, which is broad and much inflated, its margins nearly parallel until just before the apex where they abruptly round in, the apex tumid, broader than clypeus and elevated above the level of the latter. Elytra moderately long, slightly flaring, venation regular, the outer antepical usually curved and a few extra veinlets along the claval suture.

Colour: Vertex dirty straw, a black spot against either eye, behind the ocellus, a pair of oblique dashes behind the apex and another pair of obscure ones just in front of the basal angle, fuscous. Face dirty straw, the sutures, a spot above the antennal socket on either side, and about five short arcs across the most produced part of front, fuscous. Pronotum and scutellum cinereous, irregularly mottled with fuscous, the elytra pale cinereous, with the veins lighter and slightly fuscous lined.

Genitalia: Female segment short, truncate posteriorly with the lateral angles slightly produced or with the posterior margin slightly concavely excavated according to the curvature.

Described from two females collected by the author at Grand Junction, Colorado. One example is almost lacking in the fuscous markings.

Thamnotettix gladiola, n. sp.

Size and form of *longiseta* nearly. Yellowish green with the vertex tinged with orange. Length 4.5 mm.

Vertex broad, rounding, almost parallel margined, very slightly longer on middle than against the eye, twice wider than long, evenly rounding to the moderately sloping face. Face moderately broad, not inflated, margins straight to just before the apex, one-half longer than its basal width. Elytra moderately long, slightly exceeding the abdomen. Venation regular, the outer anteapical cell variable, rarely not complete.

Colour: Vertex bright lemon yellow, often with an orange tinge. Face yellow, the front tinged with orange, a black spot just outside the loræ. Pronotum pale orange yellow, an arcuated green line on anterior disc. Scutellum lemon yellow. Elytra yellowish green, subhyaline, allowing the black markings on tergum to show through. Tergum and venter often black lined.

Genitalia: Female segment two-thirds as long as its basal width, posterior margin deeply, triangularly emarginate, the emargination starting at the acute lateral angles and extending to one-half the depth of the segment at the truncate apex, where it is one-fifth the width of the segment. Male valve short, obtusely rounding, plates together attenuately triangular, almost twice as long as their basal width, the margins heavily fringed with long hairs which almost conceal two long sword-like black points which extend beyond the plates.

Described from six examples from Dutch George's North Park, and Lizard Head, Colorado, all collected by the author.

Thamnotettix umbratica, n. sp.

Form and colour of *cyperacea* nearly, much smaller and with a longer vertex. Pale straw with black dots on the vertex margin and three pale brown stripes on vertex and pronotum. Length, female, 4.5 mm.; male, 4 mm.

Vertex right angled, longer than its basal width, twice as long on middle as against the eye, disc flat, acutely angled with front, the margin slightly rounding. Front narrow, wedge-shaped, nearly twice longer than wide. Pronotum about equalling the vertex in length, elytra moderately long, slightly exceeding the abdomen, flaring. Venation regular, distinct.

Colour: Vertex straw yellow, usually the ocelli and a dot at apex black, a brown median stripe and sometimes a pair of lateral stripes next the eyes black. Sometimes all these markings are obscure. Face pale

straw, sometimes a pair of black spots above the antennæ, another pair below and some smoky arcs on front. The usual black dot outside the loræ. Pronotum straw colour, usually with a double median brown stripe and a pair of lateral ones. Elytra straw colour, with the veins light in the female, pale smoky iridescent in the male.

Genitalia: Female segment about half as long as its basal width, truncate posteriorly or slightly emarginate with a faint median production according to the curvature. Male valve triangular, plates together transversely roof-shaped, short, rounding, scarcely as long as their basal width, their apices slightly apart, exposing their pygofer and a dark style-like process.

Described from five examples from Tia Juana, Chino, Pasadena and Stanford, California, all collected by the author.

SOME INSECTS FROM STEAMBOAT SPRINGS, COLORADO—I.

BY T. D. A. COCKERELL, BOULDER, COLORADO.

Steamboat Springs is only about 85 miles from Boulder, as the crow flies. It is, however, far on the western side of the range, in a region hitherto little known to entomologists, because only quite recently accessible by rail. It is situated in a fertile valley, at an altitude of 6,680 feet, and is evidently destined to become a place of considerable importance. I recently spent a day (May 27) collecting there, and present herewith the principal results, not only on account of the general interest they seem to possess, but also in the hope of encouraging the beginnings of scientific activity among the young people of the locality. Most attention was naturally given to the bees.

HYMENOPTERA APOIDEA (Anthophoridæ and Megachilidæ).

Emphoropsis Johnsoni Ckll.—A dead male, being dragged along by an ant.

Osmia permorata, n. sp.—Female. Length about 14 mm., robust, dark green, with the legs entirely black; hair of head and thorax above very bright rich fox-red; of first abdominal segment above, and scantily on middle of second, rather paler red; elsewhere, including scopa, the hair is black except some reddish on inner side of anterior tarsi. I had confused this handsome species with *O. novomexicana* Ckll., which it superficially resembles. It is, however, easily separated by the dullish area of meta-thorax, without any pit; the same part in *novomexicana* is smooth and

shining, with a very conspicuous median pit. The third antennal joint is longer than in *novomexicana*, the marginal cell is longer and more pointed apically, and the outer t. c. is not angulate about the middle. The abdomen is broader and more globose than in *neomexicana*, and is dark green. The mesothorax is olive green. The bright red thoracic hair and green mesothorax will separate this from Cresson's *O. longula* and *juxta*; *O. longula* has the same kind of metathorax, however. The clypeus is black, produced and broadly truncate; the apical tooth of mandibles is very long and sharp, the mandibles are tridentate. *O. florissanticola* Ckll. is also related; it has the area of metathorax shining, but without a well-defined pit; the abdomen is very blue.

The maxillary blade in *O. permorata* is conspicuously obliquely striate and speckled with black, and the tongue is shorter than in *O. novomexicana*. In *O. florissanticola* the maxillary blade is dark.

Hab.—Steamboat Springs, Colorado (type locality), May 27, at flowers of *Physaria acutifolia* Rydb. (*Cockerell*); Johnson Park, New Mexico, July 4, at flowers of loco weed (*Anna Gohrman*). I am much indebted to Mr. S. A. Rohwer for notes on my type of *O. novomexicana*, which is in the National Museum.

Osmia fulgida Cress.—One female.

Osmia globosiformis, n. sp.—One male. Length about $7\frac{1}{2}$ m.m., entirely black, except that the hind margins of the abdominal segments are very narrowly rufescent; similar to *O. globosa* (cf. Psyche, 1907, p. 16), but the pubescence entirely white, not in the least ochreous, except on inner side of tarsi, where it is light yellowish, and the hind basitarsus with a tooth a little beyond the middle; antennæ, long, entirely black, third joint a trifle shorter than fourth; eyes black, cheeks broad, mesothorax densely punctured, only in the middle of the disc a little more sparsely; tegulæ fuscopiceous; wings stained with reddish; b. n. just falling short of t. m.; first r. n. at end more distant from base of second s. m. than second from apex; sixth dorsal abdominal segment faintly emarginate; seventh bidentate, the teeth very obtuse; second ventral emarginate. This can hardly be the male of *O. abjecta*, on account of the dull, closely-punctured mesothorax, the entirely dull granular area of inetathorax, etc.

Osmia nigrifrons Cress.—One female. This is identical with the "*nigrifrons* var." of the Boulder County table. It may prove to be a distinct species when the male is known.

Osmia atriventris Cress., var. a.—Two males.

Osmia amala Kll.—One male. The hind margins of the abdominal segments in this example are not violaceous (cf. Can. Ent., 1909, p. 131); a better character to separate the species from *O. integrella* is the long, dense, conspicuous fringe in the deep but narrow emargination of the third ventral segment; in *integrella* the fringe is short and inconspicuous.

Osmia pseudamala, n. sp.—One male. Length nearly 10 mm., superficially similar to *O. amala*, but very different in details of structure; head and thorax olive green, pleura and mesothorax blue-green; hair thick and long, faintly tinged with ochreous above, some long black hairs on cheeks anteriorly, but none on head or thorax above, or on pleura; mandibles bidentate, the teeth of equal length (in *O. vallicola* the apical tooth is very long); flagellum 4 mm. long, rather thick, obscure reddish beneath, not moniliform (it is moniliform in *O. physariae*, *chlorops*, etc.), much longer than in *O. mertensiae*; tegulae with at least the anterior half green; wings ordinary, b. n. going just basad of t. m.; legs more or less metallic, their hair partly black and partly white; second and third joints of middle tarsi ordinary (not globose or swollen as in *O. integrella*, etc.); hind tibia thick, with a slender base; hind spurs not at all hooked at end; abdomen shining greenish-blue, the hind margins concolorous; second segment with some black hair, subapically, following segments with much coarse black hair; sixth without evident light hair, but a brush of white hair on middle of seventh, conspicuous in lateral view; sixth segment with a deep semicircular emargination; seventh bidentate, the teeth short, and more or less concealed by hair; venter strongly blue; first segment entire; third with a deep wide emargination, fringed with pale yellowish hair, the fringe long at sides, but even, without any long falciform portion such as is found in *O. seneciophila* and *brevis*. The hind basitarsus is not toothed (it is toothed in *O. Wheeleri*, *enena*, *aprilina*, *Pasadenae* and *olivacea*).

Osmia cutrichosa, n. sp.—One male. Length about 8½ mm.; dark bluish-green, the abdomen shining, the whole insect unusually hairy, the hair dull white, faintly ochreous dorsally, *no black anywhere*; legs black with light hair, the hind femora faintly submetallic; antennae ordinary, flagellum truncate at apex, more or less stained with ferruginous beneath; tegulae green in front; wings normal, b. n. meeting t. m.; middle tarsi normal, very hairy; claw-joints ferruginous; hind basitarsus unarmed;

abdomen rather indistinctly subfasciate, apical margins of segments coloured like the rest of the surface; sixth segment with a very small notch; seventh bidentate, the teeth short and broad; genitalia nearly as in *O. inurbana*, which belongs to a different group; third ventral segment formed and fringed nearly as in *O. pseudamala*. The abdomen has only piliferous punctures. Easily known from *O. Ramaleyi* by the longer, yellowish-tinted hair on the apical half of the abdomen. The female doubtless has a light scopa.

SOME HULST TYPES OF GEOMETRIDÆ AT WASHINGTON.

BY RICHARD F. PEARSALL, BROOKLYN, N. Y.

A recent visit to the U. S. Nat. Museum, at Washington, for the purpose of studying types of this family, contained in its collections, disclosed some facts which it seems advisable to record. The following were deposited by Dr. Hulst:

Tephroclystis niveifascia.—Type No. 3920 is the specimen recorded by him as coming from Oregon. It bears the label "Kœbele, Oregon," only, and is not conspecific with the one in the Hulst collection at New Brunswick, which, in a former paper, I have already stated, finds its place under the genus *Nasusina* Pears., and will now constitute the type of the species. Among material submitted to me some time ago, and returned to the Museum at this time, I had described as new a single specimen, under the name, *Eup. segregata*, n. sp., which seems to be the same as the Oregon type, and I have therefore transferred the name to it, Dr. Dyar having generously permitted me to retain as a co-type the second specimen of *segregata*, a description of which will be found in a forthcoming paper.

Tephroclystis plumbaria.—Type No. 4701 is a fine female example of *Eup. miserulata* Grote, labelled Washington, D. C., July 5th.

Tephroclystis plenoscripta.—Type 4702 is the true type recorded from Yellowstone Park, Wyoming. A specimen from the same locality is in the Hulst collection at the Brooklyn Institute Museum. The latter represents the usual appearance of specimens, the type being an unusually clear, distinctly-marked example.

Tephroclystis flebilis.—Type No. 4920, recorded from Alaska, is a silky-gray species, with the same general appearance as *bivittata* Hulst, September, 1910

but having the subterminal white line heavy and clear, and the veins sparingly black scaled in central field.

Tephroclystis perfusca.—Type No. 3919 is the specimen referred to in his description, as coming from Utah (June), and must carry the name henceforth. The other type specimen from Easton, Oregon, now in the Hulst collection at New Brunswick, besides being not of the same species, is excluded by a previous writer, Mr. Geo. W. Taylor (CAN. ENT., Vol. XL, page 58), and his dictum must prevail, according to the rules. It is fortunate that he chose this species, for Dr. Hulst's description was evidently drawn from it, and fits exactly. Last year I received from Mr. Tom Spalding nine specimens like it, taken at Provo, Utah, all in good condition, as is the type. The wings are large and thin, with very indefinite markings, powdered with dusky atoms; and the inference which Mr. Taylor drew from its appearance, that it was beyond recognition, because "not in the best condition," as he puts it, is quite a mistake. All of my specimens are fresh, and resemble it exactly. His arbitrary selection of a common species from the Northwest, as representing *perfusca*, because of the imperfect condition of both types, as he states, is altogether unwarranted in view of the ease with which the real species can be determined, once we have the material at hand. I have deposited one of my specimens with the type in confirmation of my statements.

Tephroclystis acutipennis.—Type No. 3954 is a good representative, and even rubbed examples are easily identified by the broad brown lines bordering central field within and outwardly, at inner margin, running toward apex to centre of wing.

Selidosema lachryosum.—Type from Los Angeles Co., Calif., is the female of *Hulstina Packardaria* Hulst, which was described from four males. *S. homoferoides* Hulst, type a female, is already correctly placed by Dr. Dyar in his "List" as a synonym of *lachryosum*.

THE EDITOR will be glad to receive for publication short notes on the capture or occurrence of rare or otherwise interesting insects, particularly from Canadian localities. Details of habitat, manner and circumstances of capture, etc., will be appreciated, and such information will be acceptable, even when relating to captures, the bare records of which have already been published.

BUTTERFLY NOTES.

BY KARL R. COOLIDGE, HEREFORD, ARIZONA.

Euchloe lanceolata australis Grinnell.—Egg: Colour, when first laid, light whitish-green, but changing to orange and pale vermilion in several days' time; just before the larva makes its exit the colour is dirty brownish-yellow, particularly about the micropylar area; fusiform marked laterally with about sixteen raised vertical ridges, and finer cross veinlets between these; height about 1 mm. Emergence takes place in from four to seven days, the duration governed by weather conditions. On April 2nd, while collecting in Millard Canõn, near Pasadena, I observed a dilapidated ♀ *australis* ovipositing on a cruciferous plant, not yet determined, and carefully searching a number of these, I succeeded in collecting 31 eggs and 13 larvæ, the latter apparently all in the first instar. The eggs are variously placed as follows:

1. Eleven on under surface of leaves. In this case the eggs are seldom laid more than half way down the height of the plant, and are placed usually on the basal outer edge of the leaf, although in two cases I found them situated on the extreme edge.
2. On stem. Seven laid erect, at right angles with the stem.
3. Five on sepals of young inner buds.
4. Eight on various parts of the pedicel, but especially on the rachis.

I observed the ♀ oviposit three eggs on a single plant, but in different situations.

Young larva: Not distinguishable from the new-born caterpillar of *E. sara* or *ausonides*, Colour light orange-yellow, this becoming rapidly lighter; head small, almost black; dark coloured hairs scattered sparsely over the body. Length in motion, 1.1 mm.

Euchloe australis I would consider a good subspecies of *lanceolata*, differing at once therefrom in having the apical shading far intenser, and in the different coloration of the secondaries beneath. The size and shape of the apical bar, which Mr. Grinnell (CAN. ENT., p. 73, 1908) states in *lanceolata* is crescent-shaped, and in *australis* straight, has no taxonomic value, as in all our *Euchloids* this character is exceedingly erratic. The type locality of *australis* is Anoyo Seco Canõn and Millard Canõn, Pacific slope of the San Gabriel Mountains, Los Angeles County, California, and it ranges southward to Mexico.

E. lanceolata lanceolata flies as far north as Alaska. Its distribution through Oregon and Washington has not been apparently traced. Mr.

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Wm. H. Edwards gives Nevada and Arizona also, but I do not know any precise localities from either of these States.

Chrysophanus mariposa Reakirt.—I find in my note-book a brief description of the egg of this species, found adhering to the abdomen of a ♀ taken at Martina, Missoula County, Montana, in June, 1906. In this case, as I have occasionally noticed in various species, the egg was protruded while the ♀ was in the final pre-mortem state in the cyanide-bottle. The description may be transcribed to: Of the usual hemispherical form, marked with numerous, somewhat shallow, polygonal or semicircular depressions; colour a delicate creamish-green; it proved infertile. Lemberg has observed oviposition on the stalk and under side of leaves of *Vaccinium* in Yosemite. Strecker, in his *Lepidoptera, Heterocera Rhopalocera*, p. 91, 1874, writes of *mariposa*: "Lower California. I have seen no examples of this except the original types now in my cabinet." But Reakirt, in his description of *mariposa*, (*Proc. Ent. Soc. Phila.*, VI, p. 149, foot note, 1866), gives California as the type locality. *Mariposa* is a strikingly distinct species, and, to my mind, one of the daintiest of the genus.

Calpodus ethlius Cramer (*chemnis* Fab., *obynthus* B. L.).—Mr. Wm. Schröder, of Los Angeles, bred three specimens of this tropical species from larvæ found on Canna in July, 1906. *Ethlius* is essentially a southern species, not uncommon in the Gulf States, from Texas to Florida, and has been recorded from New York, where the eggs, larvæ or pupæ were probably carried with the food-plant. In South America to Buenos Ayres, Central America, Mexico and West Indies *ethlius* is said to be common. The occurrence in California appears to be accidental.

Eudamus proteus Linn.—This species must apparently be added to the already long list of butterfly emigrants to California. Prof. J. J. Rivers has recently recorded it (*Proc. So. Cal. Acad. Sciences*) from the vicinity of Santa Monica, and Mr. W. S. Wright (*Journ. N. Y. Ent. Soc.*, XVI, p. 166, 1908) reports it as being fairly common about San Diego. Mr. Wm. Schröder took a good series of *proteus* several years ago in the garden of the California Hospital at Los Angeles, and it is said by other collectors to be abundant in the bean-fields near that city. Still another specimen was taken in an alfalfa field at Porterville, in Tulare County, August, 1904, by Mr. W. M. Davidson, giving *proteus* quite an extended range in this State. The food-plants, as in the east, appear to be leguminous plants.

Mailed September 8th, 1910.