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The Canadian Entomologist.

VOL. XVII.

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No. 5

FURTHER MATERIAL CONCERNING THE HESSIAN FLY.

COLLECTED BY DR. H. A. HAGEN, CAMBRIDGE, MASS.

The third report of the U. S. Entomological Commission, Washington, 1883, contains an excellent paper on the Hessian Fly, by Prof. A. S. Packard, p. 195-248, and in the appendix, p. 3-49, the translation of German papers by Loew, Wagner, Cohn, Koeppen, formerly not known by the Professor; also a reprint of my paper in the CAN. ENT., Oct., 1880, "The Hessian Fly not imported from Europe." The Professor accepts now (p. 238): That the Hessian Fly had appeared in the Eastern U. S. before the Revolutionary War, and that it could not have been introduced by the Hessians. He was not able to find in the files of the Pennsylvania *Mercury* and Philadelphia *Packet* some reference to the earlier occurrence of the H. Fly (App. p. 3).

I have tried since my paper was published to make further investigations in the old American literature. Some startling discoveries will probably necessitate the modification of some of the conclusions of the Professor. But I have frankly to state that I found it very hard to investigate the older literature. The publications treating agriculturally are rare, and at least in the libraries to which I have access, mostly incomplete. Mr. A. Fitch made the same complaint forty years ago. He was not able to compare some very important papers, though his publications show clearly that perhaps no one has tried to bring together the literature with a similar care.

The Occurrence of the Hessian Fly in North America before the Revolution.

The American Philosophical Society of Philadelphia appointed, in 1791, a committee for the purpose of collecting, and communicating to the Society, materials for the natural history of the insect called Hessian Fly, as also information of the best means of preventing or destroying the insect, and whatever else relating to the same might be interesting to agriculture.

At a meeting of the committee, April 17, 1792, it was resolved, that for obtaining information of the facts necessary for forming the natural history of this insect, *before its entire evanishment from among us*, it be recommended to all persons whose situation may have brought them into acquaintance with any such facts, to communicate the same by letter, addressed to Thomas Jefferson, Esq., Secretary of the State to the United States.

Nine questions were proposed, on which information was particularly wanted. I quote here only the first.

“In what year, and at what time of the year, was this animal observed for the first time? Does it seem to have made its appearance in this country only of late years, or are there any reasons for supposing that it was known in any part of the United States previously to the commencement of the late revolution?”

The resolutions of this meeting are printed in full in Carey's *American Museum* (Philadelphia, 1792, vol. xi., June, pp. 285-287) by the committee.—Thomas Jefferson, B. Smith Barton, James Hutchinson, Caspar Wistar. The *American Museum* was discontinued after 1792. The last volume contains no report of the committee.

As is obvious from the first question, it was at this time not settled whether the insect had been observed here before the revolution, or not. Mr. A. Fitch quotes the publication in the *American Museum*, and stated that no report had been made by the committee. The importance of this question, and of a committee with Jefferson at the head, led me to ask Prof. J. P. Lesley whether the old minutes of the Philosophical Society contain any unpublished report, or anything else relating to the Hessian Fly. I received from Mr. Henry Phillips, jun., secretary of the society, the following answer, under date of March 28, 1884:—

At the request of Prof. Lesley, I have examined our old minutes in reference to the Hessian fly, and append on next page the results of my search. I know *positively** that before the revolution our newspapers are full of communications in reference to the Hessian Fly *eo nomine*. I cannot call to mind any one paper, but I remember perfectly frequently seeing these articles when reading for other purposes. I cannot find that the committee ever reported.

* The Italics are by Mr. H. Phillips.

Extracts from the Minutes.

1768, May 18. Com. on husbandry to consider whether any method can be fallen upon for preventing the damage done to wheat by the Hessian Fly. [*N. B.*—Mr. DuHamel has written on the subject.]

1768, June 21. Paper on the Hessian Fly read by Dr. Bond; ordered to be published. See No. 4, original papers.

1768, Oct. 18. Col. Landon Carter, Sabine Hill, Va. Observations on the fly weevil destructive to wheat; ordered to be published. [Is published in Vol. I. of the Transactions of the society. Cf. Harris, *Injur. Ins.*, pp. 502. Dr. H. A. H.]

1791, April 15. Jefferson, Dr. Barton, Hutchinson, Thomson and Dr. Wistar, a committee to collect materials for forming the natural history of the Hessian Fly, and the best means for its prevention and destruction. [Do not find this committee ever reported. H. P.]

1791, Aug. 19. Memoir on Hessian Fly by T. L. Mitchell, of Long Island, read.

Everybody conversant with our actual knowledge and the literature on the Hessian Fly, will acknowledge it to be excusable that I took the liberty to again ask Mr. Phillips if by chance the year 1768, together with the name Hessian Fly, was not a clerical error; the more so, as Mr. Morgan, in Dobson's *Encyclop.* (vol. viii., p. 491), states, "The name of Hessian Fly was given to this insect by myself and a friend early after its first appearance on Long Island."

I received from Mr. Phillips the following letter, dated April 1, 1884:—

1. 1768 is not an error. It occurs in the proper place in the old MS. vol., and there can be *no doubt* about the fact. *Similiter* the words *Hessian Fly*.

The term came in use in Pennsylvania from the early German immigrants long before the revolution. I am *sure* the term occurs in our Pennsylvania gazettes long prior to that period.

2. Cannot say if that paper (of Dr. Bond) was ever published. Possibly in some gazette *pro bono publico*. There is no clerical error as to the date and name.

Dobson is certainly incorrect in the statement you quote. [Mr. Morgan's pretension to have given the name Hessian Fly. Dr. H. A. H.]

At this writing it is not an easy matter for me to *verify* my own statement as to the communications which I have seen in the early Pennsyl-

vania gazettes before the revolution. I have had great use often in days past for historical researches, and the recurrence of the name of the Hessian Fly in these early days was a frequent matter of conversation with me and friends, friends of two generations older than myself. While I am perfectly convinced that my memory is accurate, yet a statement of that nature should be verified for historical use. I regret I have not the present opportunity of so doing; yet, in view of the minutes of 1768 bearing upon the matter, I don't doubt the accuracy of my memory, although it was *obiter*.

The importance of these letters is an excuse for their publication, which is done with the permission of the writer.*

April 11th, 1884.

The old minutes of the Philosophical Society are now in the way of publication, and as they contain two papers in 1768 about the damage done to wheat by the Hessian Fly, both delivered in the first half of the year, the fly must have been observed in 1767, if not earlier. Dr. Bond's paper, No. 4 of original papers, ordered to be published by the Philosophical Society, has not yet been discovered. Of course the old tradition of the importation by the Hessian troops is now effectually done away with, but some other papers never quoted show that even seventy years ago this tradition had been considered as not acceptable. The President of the Philad. Soc. for Prom. Agr., Mr. Richard Peters, in his Notices for a Young Farmer, etc. (Mem. of the Soc., 1818, vol. iv., p. xxix), says: "Its name (Hessian Fly) does not prove its importation; for that appellation was bestowed during our revolutionary excitements, when everything we disliked was termed Hessian. *In Hesse they have not this vermin to annoy their crops.*" The Vice-President of the same Society, Mr. James Mease, M. D., in his address on the progress of agriculture, Jan. 14, 1817 (*ibid.* p. lx.) says: "The wheat . . . was much injured by its old enemy, the insect absurdly called Hessian Fly." Mr.

* The proof sheet of the minutes of the Am. Phil. Soc. has, p. 15:—

The Com. for Husbandry reported a paper on the Hessian Fly by Dr. Bond, which was read, and Dr. Bond was requested "to prepare it for the press, that it may be communicated to the public without loss of time." See No. 4 of original papers. Mr. H. Phillips, jr., to whom I am indebted for being able to compare myself the proof sheet, remarks that Dr. Bond was one Dr. Thomas Bond (1712–March 26, 1784), or it may have been Dr. Phineas Bond (1717–1773). Neither was British Consul at Philadelphia.

A. Fitch (Hessian Fly, p. 19) complains that he was unable to find in either of the largest libraries of the State of New York the vol. v. of those Memoirs, and has for the same reason not seen vol. iv. The series in the Harvard Library was procured by the care of Th. W. Harris, but vol. iii. is wanting, as it could not be procured by the Society. Mr. Harris' correspondence is affixed to the first volume, and shows how difficult it was in 1845 to get those Memoirs.

The opinion given by Mr. R. Peters concerning the origin of the name Hessian Fly is corroborated by Mr. Bond's relation upon another insect (Encycl. Britan. p. 494). "This insect," says he, "is called in Maryland the Revolution Fly, by the friends of the British Government; but from all I can learn it is not the same insect which originated on Long Island and is called the Hessian Fly (by way of opprobrium) by those who favored the Revolution." Prof. Packard objects, p. 236, that the words, "before the arrival of the troops," in quoting Mr. Mitchell's statement—it (the H. Fly) was first discovered in the year 1776—are my own and not Mr. Mitchell's. If Prof. Packard had compared the Enc. Brit.,—he states that he had not seen it—he would have scarcely objected to my statement. The whole passage by Mitchell is interesting to be quoted in full: "As it (H. Fly) appeared *about* the time that the Hessian troops arrived, an opinion had gone abroad that they brought it along with them; but the Doctor (Mr. Mitchell) was of opinion that it is a native animal, nourished by some indigenous plant, but which then, for the first time, came among the wheat and found it proper food."

As it seems that the article, "Hessian Fly," in the Encycl. Britan., is not so well known as it merits to be, I have taken particular care to find out the editions in which it is contained. It appears first in the third edition, vol. viii., p. 489-495, in 1797, and exactly the same in Dobson's first edition, 1798, vol. viii., p. 489-495.* The only copy of the third edition I was able to find belongs to the Essex Institute in Salem, Mass. The fourth edition is rather rare; I have seen no copy, but Prof. W. B. Nichols has kindly compared a copy in the Brit. Museum; the title, Hessian Fly, in vol. x., 1810, is exactly identical with the third edition, and also with the fifth edition, 1817.

I was not able to see the sixth edition. In the seventh and eighth the article Hessian Fly is wanting, but in the ninth, 1880, appears a new one

* This edition is always quoted by me.

filling one page and a half. I cannot make out by whom the article in the third, fourth and fifth editions is written. It is not only interesting, but important, as it was largely used in the pamphlet printed by the order of the Parliament. I have not extracted the article in the Encyc. Britan., as the Dobson's edition at least is present in every library. But I shall quote in the Parliament pamphlet the letters reprinted or extracted in Encycl. Britan. The Encycl. Perthensis, vol. xi., p. 254-256, has the same article somewhat abridged.

In the three copies of the Brit. Parliamentary papers which I was able to consult, I found in the printed papers of the House of Commons that April 21, 1789, was ordered to be printed a paper entitled "Proceedings of His Majesty's Most Honorable Council, and Information Received Respecting an Insect Supposed to Infest the Wheat of the Territories of the United States of America." But the paper itself seems to be wanting in those three copies. Kirby speaks of a vast amount of material collected by the Council, which filled upwards of 200 octavo pages. As this paper contains several reports by Sir Joseph Banks and others, and as it seems to have been used only in the article of the Encycl. Britan., I was very eager to know something more. Prof. W. R. Nichols, of Boston, was so kind as to make in the British Museum the following index of the contents of this paper:—

This is a 4to pamphlet of 65 pages, and, of course, it would be too expensive a matter to have the whole thing copied without special directions. I will give you, however, a list of everything in the volume, and state just how long each portion is.

Contents of Paper Referred to.

1. Letter from Mr. Bond, Consul at Philadelphia, to the Marquis of Carmarthen, 22nd April, 1788; half page.
2. Letter from Sir Joseph Banks to the Marquis of C., 4th June, 1788; one page.
3. Order in Council forbidding any entry of wheat, etc., etc., 25th June, 1788; half page.
4. Minute of Council, 4th July, 1788; one and a half pages.
5. " " 5th " " " " (Containing statement by Sir Joseph Banks.)
6. Report of Sir Joseph Banks, proposing the mode of making experiment on the American wheat, 6th July, 1788; half page.

7. Order in Council directing the experiment to be made, 8th July, 1788; half page.
8. Further account of the Hessian Fly by Sir Joseph Banks, and a statement of the printed accounts published in America, 8th July, 1788; two pages.
9. Account of wheat imported into England, etc, tables; three pages.
10. " " " " Scotland, etc., table; one page.
11. Report of examination of cargoes of wheat from N. Y. (including half page report of Sir J. Banks, 17th July, 1788); two and a third pages.
12. General report of Sir Joseph Banks respecting the Hessian Fly and Flying Weevil, 24th July 1788; three pages.
13. Minute of resolution of the Lords of the Council, not to permit the entry of any wheat which, upon inspection, shall be found to have been infected; but that it might be expedient for government to purchase such cargoes, and Order thereupon, 5th August, 1788; half page.
14. Return from the principal officers of the Customs, etc., etc., 6th August, 1788 (contains 6 line report of Sir J. B.); two pages.
15. Letter from M. Broussonet to His Grace the Duke of Dorset, 3rd September, 1788 (containing Extraits des Registres de la Société Royale d'Agriculture du 28 Aout, 1788; three pages.
16. Letter from Mr. Ewart to the Marquis of Carmarthen, dated Berlin, 9th Aug., 1788; quarter page.
17. Extract of a letter from Sir John Temple to the Marquis of Carmarthen, with four inclosures (letters from America), dated New York, 4th Sept., 1788; six pages.
[This includes a reference to the American Philosophical Transactions published in Philadelphia, in 1771.]
18. Letter from Sir Robert Murray Keith to the Marquis of C., dated Vienna, Oct. 8, 1788; half page.
19. Extract letter from Mr. Walpole to the M. of C., Oct. 23, 1788; two-thirds page.
20. Extract letter from Mr. Mathias to the M. of C. (with two inclosures), dated Hamburgh, 19th Sept., 1788; one and a quarter pages.
21. Letter from Mr. Gibson to the M. of C., dated Dantzic, 29th Oct., 1788; two-thirds page.
22. Letter from Mr. Bond to the M. of C., with its several inclosures, dated Philadelphia, 1st Oct., 1788; fifteen pages.

23. Extract letter from Lord Torrington to the Marq. of C., dated Brussels, July 28, 1788; two and a quarter pages.

24. Letter from Mr. Walpole to the M. of C., with copies of two inclosures, dated Manheim, Feb. 21, 1789; two pages.

25. Extract letter from Mr. Heathcote to the M. of C., with two inclosures, dated Bonn, Feb. 16, 1789; one and a quarter pages.

26. Report of Sir Joseph Banks upon the above correspondence, and information, dated 2nd March, 1789; two and a half pages.

[He refers at the end to the following books: *Histoire d'un Insecte qui dévore les grains de l'Angoumois*, par MM. Du Hamel & Tillet, Paris, 1762, 12mo.; *Memoire sur l'accident que les Blés de la Recolte de cette Année ont éprouvé en Poitou, etc.*, par MM. Parmentier & Cadet de Vaux, Paris, 1785, 8vo. *On Root-worms*, by M. Bierkander, published in the Transactions of the Royal Academy of Sciences of Stockholm, 1777. *Della Malattia del grano in Erba*, del Conte Francesco Ginanni, Pesaro, 1759, 4to. *Mezzi per distrugerei Vermi che rodono il grano in Erba, etc.*, Abbate Bonaventura Corti. Printed in *Scelta di Opuscoli interessanti*, vol. 34, p. 3.]

27. Letter from Mr. Bond to the Marq. of C., with copy of inclosure, dated Philadelphia, November 3, 1788; one and two-thirds pages.

28. Letter from Mr. Bond to the Marq. of C., dated Philadelphia, Jan. 20, 1789; 1 page.

29. Extract letter from Sir Joseph Temple to the M. of C., with two inclosures, dated New York, Feb. 21, 1789; one and a quarter pages.

30. Extract letter from Mr. Miller to the M. of C., dated Charles Town, 12th Feb., 1789; quarter page.

I have compared with this index the statements given in the *Encycl. Britan.* (Dobson's Edit. is quoted) and have noted by the single numbers what I believed to be useful for a better understanding.

As of late years (E. B. p. 490) great quantities of wheat were exported from America into Britain, it became an object worthy of the attention of Government to consider how far it was proper to allow of such importation, lest this destructive insect might be brought along with the grain.

No. 1. Mr. Bond* informed that there was a design to export wheat from Philadelphia to England, that the fly had made great depredations,

* This Mr. Bond is not the Dr. Bond quoted before in the minutes of the Amer. Philosoph. Soc. I cannot find out anything more about him.

and that there might be danger of its thus being conveyed across the Atlantic. He added, it was not known where the eggs of the insect were deposited, though it was supposed to be in the grain (p. 490).

Nos. 2, 5, 7 and 8. Sir Joseph Banks mistook at first an insect called the Flying Weevil for the Hessian Fly. But in a little time he corrected his mistake, adding that the danger of importing this insect was much greater than that of the Hessian Fly. He proposed an examination of the corn already brought from America (p. 490).

No. 12. General report of Sir Joseph Banks. None of the grain which was examined showed any signs of the fly; but as some imported in August contained the chrysalis perhaps of the Flying Weevil, the cargo should not be suffered to come into the kingdom (p. 490-491).

No 15. Speaks of two insects infesting the wheat in France. The Royal Soc. of Agriculture remarked that the larva of one of them does not appear to differ from the American insect (the quotation of the Stockholm Memoirs leads to the supposition that this is *Oscinis*.—Dr. H. A. H.) The mischief which they do to the corn having never been considerable enough to attract the attention of the Government, the Society regrets not being able to say anything particular upon that subject (p. 491).

No. 17. Sir John Temple, at New York, the British Consul-general, gives the statements of Mr. Morgan quoted by A. Fitch (491-492).

No. 22. Mr. Bond gives good information, which is at some length reprinted (p. 492-493).

No. 26. From the whole correspondence on this subject, Sir Joseph Banks drew up a report for the Privy Council, which is also reprinted at some length, together with an appendix dated April 27, 1879 (p. 493-494).

No. 28. Mr. Bond's letter (p. 495).

As much as the Professor has, after the study of the German literature, changed his former opinions and conclusions, he will have to change the remainder of his conclusions after a closer study of the American literature.

"Now if the Hessian Fly (Packard, p. 239) had been indigenous many years before 1776 in the wheat fields of this country, some at least would probably have been carried in loads of grain to England." The discovery in the minutes of the Amer. Philos. Soc. makes this presumption untenable. The same is the case with the following supposition (p. 239): "On the other hand, it may have been imported into the French colonies in Canada from Southern France, by immigrants." But it is well known that the immigrants into the French colonies in Canada came all from the

north-western parts of France. There is nothing known about a trade between Canada and the Mediterranean ports of France; the trade was with the western ports. The first mention of the Hessian Fly in Canada in the chronological table of the Professor is 1805. The troops were sent by the way of Brest. To be sure of the facts I applied to the best authority, Mr. Fr. Parkman, who has kindly confirmed in a note the above given statements.

The fourth conclusion (p. 238) of the Professor reads as follows: "That it (Hess. Fly) has *from time immemorial* been an inhabitant of wheat fields on the shores of the Mediterranean, in Spain, at Toulon in France, at Naples, in Minorca and Asia Minor."

It should have been remarked that the statement *from time immemorial* in Mr. Dana's report applies *only* to Minorca and Spain. Such statements by agriculturists or peasants are to be taken for what they are worth, if not corroborated by reliable published reports. After all it is obvious that this statement states too much. The experience of a century has shown that the Hessian Fly has nowhere been from time immemorial the inhabitant of the same spot.

Concerning France, the letter of Mr. Broussonet (Encycl. Britan. and Parliamentary Report) proves directly that no mischief was done considerable enough to attract the attention of the Government. The specimens collected by Mr. Dana at Toulon are the only ones known from this part of France.

Concerning Italy, I know nothing except the few specimens collected near Naples by Mr. Dana; but I have taken steps to receive direct statements from Italy as well as from Spain. I have not yet been able to compare the two Italian publications quoted in the report of Sir Joseph Banks. The quotation of Asia Minor should have contained that Prof. Loew had not seen the fly, but had collected near the shore a larva and pupa on the straw, later recognized by him as identical with his *Cec. secalina*.

I believe that the value of the Professor's fourth conclusion is rather doubtful after the statements just given, and the value of the fifth conclusion, "that it probably originated in this (Mediterranean) region or farther east, the probable original habitat of the wheat and other cereals," is nothing more than a supposition of B. Wagner. But the statement that these cereals still live wild in Persia is not proved at all, and certainly neither the fly nor any record about any mischief done by it in the Orient has been found.

The sixth conclusion (p. 238) of the Professor is also an adoption of B. Wagner's views: "That it was introduced from Southern Europe, either Southern France or Mediterranean regions, perhaps Asia Minor, before the Revolutionary War." But Wagner speaks with more reserve and caution. Having felt the strength of the objections to an introduction of the insect by a longer voyage, he supposes that importation had been possible only from the nearest coast of France. But his assumption of the long-existing occurrence of the insect in Southern France is not corroborated by any fact whatsoever, beyond the few specimens found in 1834 by Mr. Dana near Toulon. Whether a large trade between the Mediterranean shores and North America existed before the Revolution, or not, I am unable to state. But some very interesting facts out of the memorandum book of his father, communicated by the late Mr. N. Silsbee, show that immediately after the Revolution an active trade from Salem, Mass., to Leghorn and other Italian cities, was kept up, principally bringing over American meal. It may therefore be supposed that this trade was not an entirely new feature, at least it was spoken of as a well known fact. Had not the difficulty, or perhaps better, the impossibility, of introducing the insect by trade been proved by the immense trade during all this time with England, where by the greatest care and attention the insect was never observed in the cargoes, it could have been assumed that the fly had been introduced just by American trade to all the places visited by Mr. Dana. At least there was the same chance for an introduction from Europe to America, as from America to Europe. Nevertheless just this difficulty makes it more plausible that the insect was indigenous here as well as in the Old World, a statement so well expressed a century ago by Dr. Mitchell (*Encycl. Britan.*, p. 494).

The *Memoirs of the Philad. Soc. for Promoting Agriculture*, contain in Vol. IV., 1818, p. xxix., Notes for a Young Farmer, etc., by Richard Peters, President of the Soc. :

It is not yet agreed what kind of wheats best withstand the Hessian Fly. . . . Good farming, manure and reasonably late sowing are certainly the best securities. It is most probably a native here. It never entirely leaves us, though it appears at irregular periods in numbers less scourging than at times when its ravages are more conspicuously destructive. [Here follows the passage concerning its name, as quoted before; and p. lii., a note of Say's description of the fly and its parasites.]

P. xl., Address on the Progress of Agriculture, January 14, 1817, by James Mease, M. D., Vice-President.

Wheat, barley and oats have been as productive as common, except where the first named grain was much injured by its old enemy, the insect absurdly called Hessian Fly; another proof that a cold winter has no influence in destroying that pest.

Further, in communications in consequence of the request of the Society, on the circumstances attending the season of 1816.

P. 200, Joseph Gibbons: Hessian Fly locally in Springfield.

Delaware Co.: Note by R. Peters.

P. 204, Henry Cox, London Grove, Pa.: Hessian Fly undisturbed.

P. 211, Richard J. Jones, Kinnerely, Md.: H. Fly very destructive.

P. 216, R. K. Meade, Virginia: H. Fly present.

[All these data are wanting in the chronological table.]

P. 224-226, a letter by Th. Say containing remarks on the H. Fly.

P. 236-237, a letter by Th. Say containing remarks on the H. Fly.

Vol. V., 1826:

P. 135-137. On the Hessian Fly, by John Linton, April 30, 1821. Description of a simple machine to brush the field with a branch of a tree to destroy the H. Fly.

A note on p. iv. of the contents states: "The implement mentioned by Mr. Linton has not been found to answer the purpose intended by it."

P. 143-153. Some Observations on the Hessian Fly; written in the year 1797 by Dr. Isaac Chapman; read August 14, 1820; at the end a note by Dr. M. (probably Mease).

This paper is one of the most important, based upon personal observations from 1786 to 1797. It has been used by Harris. The note at the end states that after the observations of Mr. Worth, there are certainly three annual generations instead of two, as stated by Mr. Chapman. Chapman's paper should be quoted as belonging to the literature of 1826.

An anonymous article, "The Hessian Fly," in the *Albany Gazette* of June, 1799, is reprinted in the *Agricultural Museum* (by D. Wiley), Georgetown, Ca., 1811, vol. 1, p. 39.

Memoirs of the Board of Agriculture of the St. of New York, Albany, 1821, vol. i., contains:

Featherstonaugh, G. W. An essay on the principles and practice of rural economy; chap. ix., metamorphoses of insects, p. 170, gives a short account of the Hessian Fly, "which has now greatly abated."

P. 62, a letter from Exc. George Washington, Mount Vernon, 15th July, 1797.

Our crop of wheat this year will be very short, owing to three causes, . . . and which is more to be regretted, to what with us is denominated the Hessian Fly, which has spread devastation more or less in all quarters.

[This year is wanting in the chronological table.]

Matth. Carey, *American Museum*, contains many communications and is largely used by A. Fitch. Nearly all authors quoted to 1792 are reprinted in full in the *American Museum*.

A premium was proposed by the Philad. Soc. for Prom. Agriculture for 1788 (Carey, vol. iii., p. 176) :

"8. For the best information, the result of actual experience, for preventing damage to crops by insects, especially the Hessian Fly, the Wheat Fly, or Fly Weevil, the Pea Bug, and the Corn Chinch-bug or Fly—a gold medal ; a silver medal for the second best."

The same premium was offered for 1789 (Carey, vol. v., p. 159), for 1790 (Carey, vol. vii., p. 271) and for 1791 (Carey, vol. ix., p. 170). But I find nowhere mentioned that the premium was awarded.

The remarkable, not to say extraordinary circumstance, that the excitement during the Revolution led to entire forgetfulness of the former presence of the Hessian Fly, makes it, as I believe, more important to follow up as carefully as possible the literature before and after the Revolution. I will be indeed very much indebted for the communication of every fact not yet recorded.

A. A. A. S.

The next meeting of the A. A. A. S. will be held at Ann Arbor, Mich., commencing Aug. 26th, 1885. The Entomological Club will meet at that place on August 25th, 1885, according to its by-laws ; exact locality not yet determined.

Will those members of the Club, or other Entomologists, who expect to be present, please notify one of the undersigned, and also send in the title of any papers they expect to read, and state the length of time they expect to occupy, so that a programme can be arranged? The exact place and hour of meeting, as well as the programme so far as fixed, will be published later.

Committee : JOHN B. SMITH, Brooklyn, N. Y., Chairman ; HERBERT OSBORN, Ames, Ia.; B. PICKMAN MANN, Washington, D. C.

NEW LIST OF THE NORTH AMERICAN DAGGER MOTHS.

BY AUG. R. GROTE, A. M., BREMEN, GERMANY.

The name "Dagger Moths" is given to a group of white and gray Noctuidæ, or Owlet Moths, which, in the perfect state, possess a certain similarity in appearance, but are often quite dissimilar as caterpillars, not only among themselves, but as compared with the other Noctuidæ, with which Family they are classified. The name itself alludes to a black mark which many of the species show near the internal angle of the fore wings, which resembles a dagger, or the Greek letter *Psi*. The caterpillars are often ornamented with curious hairs or bristles; several are shaggy in appearance, so that they look like *Arctiada* or *Dasychira*. This peculiarity is shared, however, by other genera such as *Platyserura* and *Charadra*, which I classify with them as a subordinate Group of the Noctuidæ under the name of *Bombycoidea*, or perhaps more properly, *Apatelina*.

The use of the generic name *Apatela* is sanctioned by Stephens, in every way a most excellent authority in this group of moths. It is first used by Hübner in his Tentamen, with the type *Auricoma*, and in a strict sense it must be retained for that section of the genus to which this species belongs. I refer to the Preface of the first part of my first Check List of the Noctuidæ for the grounds on which I use certain of Hübner's generic names. Also to a recent article of mine in "Papilio," wherein I show under what limitations I am now constrained to admit the validity of this author's generic titles. Harris uses *Apatela* for his species *Americana*, but this is not strictly congeneric with *Auricoma*, but falls under a distinct section which I have called *Megacronycta*. As a whole, the Dagger Moths have simple antennæ, the palpi are short with small third article and shortly haired. The eyes are naked; the body usually untufted on the dorsum; the legs unarmed. The hairy larvæ, somewhat arctiiform, construct a rather tough cocoon and usually appear in the spring as moths. Some species appear to be double brooded, others only so in the South. The limits of the genus are perhaps really overstepped in the case of the Californian species referred to the section *Merolonche*, and perhaps again with regard to the Eastern *Oblinita* and allies, the section *Eulonche*. Almost all of the writers who have written on our moths have given more or less attention to this interesting genus. Mr. Saunders was the first to

discover the larva of *occidentalis*; under the name of *Populi* Prof. Riley has given us a description and drawing of the larva of *lepusculina*; but perhaps more work with the best results has been performed by Mr. Roland Thaxter, who has proved himself a most conscientious student and kind personal friend to me. The present list supplements my former lists, the last of which is contained in "Papilio," and corrects certain inaccuracies which crept into them.

Genus APATELA Hübn.

Subgenus *Triaena* Hübn.

Type: A. Psi.

1. *Occidentalis* G. & R. "Western Dagger." Larva on apple and elm, (Saunders, Thaxter).
2. *Morula* G. & R. "Ochre Dagger." Larva on apple and elm, (Thaxter).
3. *Lobeliae* Guen. "Large Dagger." Larva on burr oak, (Coquillet).
4. *Hasta* Guen. "Smoky Dagger."
5. *Furcifera* Guen. "Forked Dagger." Larva on wild cherry, (Thaxter).
6. *Thoracica* Gr.
7. *Dentata* Gr.
8. *Grisea* Walk. "Pale Dagger."
Pudorata Morr.
9. *Tritona* Hübn. "Brown Dagger."
10. *Falcula* Gr. "Edged Dagger." Larva on hazel, (Coquillet).
11. *Parallela* Gr.
§
12. *Albarufa* Gr. "Red and White Dagger."
Walkerii And,
§
13. *Paupercula* Gr. "Small Dagger."
14. *Vinnula* Gr. "Olive Dagger." Larva on elm, (Thaxter).
§
15. *Quadrata* Gr. "Square Dagger." Larva (Dodge).
16. *Clarescens* Guen. "Clear Dagger." Larva on wild cherry, apple, (Thaxter).
17. *Harveyana* Gr. "Harvey's Dagger."
18. *Radcliffei* Harvey. "Radcliffe's Dagger." Larva on wild cherry, apple, (Thaxter).
19. *Tota* Gr.

Subgenus *Acronicta* Ochs.Type: *A. Leporina*.

20. *Lepusculina Guen.* "Poplar Dagger." Larva on poplar, (Riley).
Populi Riley.
21. *Felina Gr.* (an sp. præc.?) Larva on poplar, (Edwards).
22. *Vulpina Gr.* "Birch Dagger." Larva on birch, (Thaxter).
- §
23. *Innotata Guen.* "Graef's Dagger."
Graefii Gr.

Subgenus *Megacronycta* Gr.Type: *A. Americana*.

24. *Americana Harris.* "American Dagger." Larva on oak, (Coquillet);
also on maple, walnut, ash (Thaxter).
25. *Dactylina Gr.* "Fingered Dagger." Larva on alder and willow,
(Thaxter).
26. *Insita Walk.*

Subgenus *Merolonche* Gr.Type: *A. Spinea*.

27. *Spinea Gr.* "Spiny Dagger." Larva (Edwards).
28. *Lupini Gr.* "Lupin Dagger." Larva (Edwards).

Subgenus *Apatela* Hübn.Type: *A. Auricoma*.

29. *Brumosa Guen.* "Verrill's Dagger." Larva on birch, willow, poplar,
(Thaxter).
Verrillii Gr.
Fasciata Walk.
Impressa Walk.
30. *Distans Gr.*
31. *Rubricoma Guen.* "Red Dagger."
32. *Luteicoma Guen.* MS. Gr. "Plain Dagger." Larva on linden, ash,
maple, cherry, apple, etc. (Thaxter).
33. *Subochrea Gr.* "Bright Dagger."
34. *Perdita Gr.*
35. *Afflicta Gr.* "Dark Dagger." Larva on oak, (Thaxter).
36. *Noctivaga Gr.* "Black Dagger." Larva on poplar, (Thaxter).
37. *Superans Guen.* Larva on plum and hazel, (Saunders).
38. *Connecta Gr.*

Subgenus *Jochaea* Hübn.

Type: A. Alni.

- 39.
- Funeralis*
- G. & R. "Odd Dagger." Larva on hickory, (Thaxter).

Subgenus *Lepitorea* Gr.

Type: A. Hamamelis.

- 40.
- Ovata*
- Gr. "Oval Dagger."

- 41.
- Exilis*
- Gr.

- 42.
- Hamamelis*
- Guen. "Hazel Dagger." Larva on chestnut, oak, (Goodell, Thaxter).

- 43.
- Haesitata*
- Gr.

- 44.
- Increta*
- Morr.

- 45.
- Dissecta*
- G. & R. "Frail Dagger." The flimsiest, smallest species.

Subgenus *Arctomyscis* Hübn.

Type: A. Euphrasæ.

- 46.
- Sperata*
- Gr.

Subgenus *Mastiphanes* Gr.

Type: A. Xyliniformis.

- 47.
- Xyliniformis*
- Guen. "Sleepy Dagger." Larva on birch, blackberry, (Thaxter).

- 48.
- Pallidicoma*
- Gr.

- 49.
- Extricata*
- Gr.

- 50.
- Edolata*
- Gr.

- 51.
- Lithospila*
- Gr. "Streaked Dagger."

Subgenus *Eulonche* Gr.

Type: A. Oblinita.

- 52.
- Oblinita*
- A. & S. "Smear'd Dagger." Larva on button bush, etc. (Thaxter). Strawberry, poplar, (Saunders).

- 53.
- Lanceolaria*
- Gr. "Pointed Dagger." Larva on plantain, etc. (Thaxter).

- 54.
- Insolita*
- Gr. "Rare Dagger."

*Desiderata.*A. *Spinigera* Guen.A. *Telum* Guen.A. *Interrupta* Guen.A. *Longa* Guen.A. *Ulmi* Harr. Corr.A. *Pruni* Harr. Corr.A. *Salicis* Harr. Corr.

A. Aceris Abb. & Sm.

A. Hastulifera Abb. & Sm.

These species have not been identified satisfactorily by me. Harris' species are posthumous and founded on the larvæ alone. They cannot in any event disturb the synonymy of species described before Mr. Scudder's publication of Harris' Entomological Correspondence. For Abbot & Smith's *Aceris* the name *Acericola* has been proposed by Gueneé. If *Aceris* A. & S. is *Americana*, which I doubt, then both *Aceris* and *Acericola* fall away before *Americana* of Harris. The North American species of *Apatela* outnumber the European in the proportion of three to one.

DESCRIPTION OF MATURE LARVA AND CHRYSALIS OF NISONIADES ICELUS, LINTNER.

BY W. H. EDWARDS, COALBURGH, W. VA.

On 20th June, 1884, I found on edge of leaf of an Aspen, *P. tremuloides*, a young larva of species of *Nisoniades* unknown. A small bit of the leaf was cut on two sides perpendicular to the edge, folded over and stitched down. At a little distance from this shelter a hole was eaten in the leaf. Two days later the hole was enlarged and the larva evidently had left its nest and returned to it after feeding. On 27th June one moult was passed, supposed to be the first; on 5th July a second; on 16th July a third. This was the last moult, but I am not sure that one did not take place between the 5th and 16th. It is probable there were four moults, as *N. Lucilius* is reported by Prof. Lintner to moult four times. The larva was kept in a jelly glass, and being always concealed in a leaf, a moult might have escaped me. On 20th July, or 4 days after last moult, the description was as follows:—

MATURE LARVA.—Length $1\frac{5}{16}$, greatest breadth (in middle) $1\frac{1}{16}$ inch; obese, tapering either way from middle, the dorsum elevated and sloping towards 2 and 13 about equally; color gray-green, caused by fine whitish granulations on a pale green surface; over all the dorsal region a yellowish tint; a mid-dorsal dark line from 4 to 12; a sub-dorsal white stripe on either side; no other markings; segment 2 yellow (no black on this segment); whole upper surface covered by a fine gray down; head sub-cordate, deeply depressed, broader than high; color all light red-brown; the surface granulated, and covered with a fine down; the ocelli red-brown on a black demi-stripe.

On 30th July, the length was $1\frac{5}{16}$, breadth $1\frac{1}{16}$ inch; but excepting in increased stoutness, the appearance was just as described.

Before 30th July this larva had stopped feeding, and I expected pupation daily. But after a week or two of this, it seemed probable hibernation had set in, and I placed it in the cellar. At intervals I examined it and found it had not moved. On 19th Sept. I sent this larva with many others to Clifton Springs, New York, to be placed in the "cooler" of the Sanitarium, where the temp. all the year is kept at about 40° Fahr.

On 7th March, 1885, I received all the larvæ from Clifton. The Nisoniades was in a small paper box, and after it had left me (19th Sept.) it had stitched the paper cone it rested in by one end to the side of the box. The cone was laid loosely in the box when I sent it away, and came back fastened to the side, showing that at some time the larva had been sufficiently active to make its nest secure. This larva eat nothing after hibernation, and there was no evidence that it ever left its cone, but as I had frequently to break the threads that closed the cone in order to keep watch on the inhabitant, and always found the edges closed again, it was evident that the larva was not always soundly sleeping. On night of 27-28 April pupation took place.

DESCRIPTION OF CHRYSALIS.—Length $1\frac{5}{16}$ inch; breadth across mesonotum $1\frac{1}{16}$, across abdomen $1\frac{5}{16}$ inch; cylindrical, the abdomen conical; head case produced, rounded, and bent down, i. e., towards ventral side; mesonotum broad, rather high, rounded, not carinated; followed by a shallow excavation which is continued across the wing cases; surface smooth; color of head case reddish-brown; of wing cases less red, more brown, with a greenish tint; of mesonotum more yellow; of abdomen pale flesh color; the cremaster straight, small and short, fastened to support by a tuft of white silk; the surface of this chrysalis is covered by a fine short down, and about the head case are scattered short hairs.

The imago came forth 13th May, *N. Icelus*. To make sure of the species, I submitted it to Prof. Lintner. The description of the mature larva will answer as to color and markings for all the stages after first moult. The Aspen was brought from the Catskill Mts. I have formerly in one instance had the same larva here from English Filbert, but the imago failed to appear.

Very little seems to be known of the preparatory stages of the American species of this genus. Prof. Fernald says, But. Maine, of *N. Briso*, "The

larva is said to feed on oak and *Cynoglossum Morisoni*." Of *Persius*, "The larva, according to Scudder, feeds on willow, poplar and *Lespedeza capitata*." Of *Icelus*, "The early stages of this common species are not known." Mr. Scudder gives the food plants of three species, in "Butterflies." On p. 114 we read: "The caterpillars hibernate full fed, and only change to chrysalis as winter's icy bonds begin to break," and on same page is given a cut of larva and chrysalis of *N. Ennius*, a species unknown to me, and so far as I am aware, undescribed. Dr. Harris describes the caterpillar of *Juvenalis* as if he had seen it, but the chrysalis from one of Abbot's figures, and says: "Mr. Abbot informs us that in summer the skipper leaves the chrysalis in nine days, but the autumnal brood continues in the chrysalis state throughout the winter." For *Brizo*, he refers to Boisduval and LeConte's figures of caterpillar and chrysalis, and these are copied after Abbot. Abbot says of *Juvenalis*: "One of them spun itself up July 26th, changed 27th, and came out Aug. 5th. Some that enclosed themselves in Sept. and Oct. did not come out till the 22nd of March following." Abbot, in *Ins. Ga.*, figures no *Nisoniades* but *Juvenalis*. His larvæ behaved very differently from this of *Icelus*, or from the account given by Mr. Scudder. By the time *Icelus* was hibernating, the *Juvenalis* had pupated, and the late brood, Sept. and Oct., Abbot says, pupated and passed the winter in chrysalis.

The only satisfactory description of a *Nisoniades* caterpillar published is that of *Lucilius* by Prof. Lintner, *Ent. Cont.*, 4, 67. He in fact describes all stages, egg, four moults and chrysalis. His larva fed on *Aquilegia Canadensis*, pupated 6th August, and the imago came out 12th August. Two other larvæ pupated 8th and 9th August, and both gave butterflies on 15th of same month. Mr. Lintner says that there are two annual broods of the butterfly, and possibly a third. So far as I know, the references to the life-history of our *Nisoniades* above given embrace everything that has been published.

The behavior of *Icelus* is therefore peculiar to itself so far as anything is known of the genus in this country; the larva going into lethargy so early in the season, the last of July, and that when fully mature and when pupation might naturally be expected; spending eight months in that condition, eating nothing in the spring, but pupating several weeks after mild weather had come. There might have been an earlier brood than the one of July, but probably there was no later one, and the two, if there be two, must be the limit.