

## Entomology Before 1854

B. ELWOOD MONTGOMERY, Purdue University

It is the purpose of this introductory paper to discuss the status of insects and the history of Entomology before 1854, excluding any reference to Indiana which will be the subject of the second paper. As it is obviously impossible to cover the history of Entomology to 1854, even in the most cursory manner, within a reasonable time, I shall confine my remarks to two small and unrelated segments of this history. First, I shall examine briefly the place insects occupied in the life of ancient peoples, chiefly by a review of the references to insects in the Bible.<sup>1</sup> Then, I shall try to summarize the condition of economic entomology in America before 1854 by means of some tabulations of the papers published on the subject and of the insects mentioned.

Howard (1930) indicated that insects were little noticed and of little importance before the Revolutionary War:

"The crops of the early colonists in America apparently did not suffer seriously from the attacks of insects. The growth of agriculture was relatively slow. The opportunities for the introduction of new insects from other countries were practically non-existent. Apparently very few native insects changed their habits and took to cultivated crops."

Furthermore, he implied that insects received very little attention until long after 1854:

"It is interesting to note that from 1771 until 1880 there were only 60 men in the whole of North America who wrote worth-while notes or articles on injurious insects. Between 1771 and the outbreak of the Civil War there were only 23 such writers."

A contemporary observer also indicated that the colonists were little interested in scientific matters. Pehr Kalm, the Finnish naturalist who traveled in America during 1748-1751, while in French Canada, recorded in his diary on July 2nd, 1749:

"I found that the people of distinction had here in general a much greater taste for natural history and other learning than in the English colonies, where it was everybody's sole care and employment to scrape a fortune together, and where the sciences were held in universal contempt." However, Foster, the translator of the 1770 English edition of Kalm's travelogue, included a footnote, with a vigorous denial, "One need only cast an eye on Dr. Linne's new edition of his *Systema* . . . in order to be convinced that the English in America have contributed a greater share towards promoting natural history, than any nation under heaven, and certainly more than the French, though their learned men are often handsomely pensioned by their great Monarque: on the other hand the English study that branch of knowledge, from the sole motive of its utility." (Benson, 1937.)

---

1. The portion of the discussion dealing with insects in ancient times will be published elsewhere.

Kalm was able to assemble a very considerable amount of information about the natural history of the colonies, much of it gleaned from the colonists in spite of his opinion of their interest in the subject. His observations on insects were rather extensive and give us some idea of their importance in colonial life.

On December 9, 1748, writing his diary at Philadelphia, he recorded observations and information on a number of pests, including the 17-year cicada, caterpillars defoliating trees, "grass-worms" (army worms?), clothes moths, fleas, crickets, bedbugs, cockroaches and mosquitoes. Kalm was greatly impressed by the damage caused by the pea weevil, stating that peas were no longer cultivated in Pennsylvania, and to only a very limited extent in New Jersey and New York because of the damage by this pest.

About a century before Kalm's voyage to America, John Josselyn, an Englishman, had spent some time in this country on two trips, 1638-39 and 1663-71, and, in the account of his travels published in 1672, noted certain pests (Felter 1927). These included ticks, bedbugs, mosquitoes, black flies and deer flies.

Slingerland and Crosby (1924) quote a certain John Hull as recording in 1661, that "the cankerworm hath for four years devoured most of the apples in Boston, so that the trees look in June as if it were the ninth month."

Baird (1917) has traced some early outbreaks of the forest tent caterpillar, finding that Smith and Abbott, in 1797, reported it "sometimes so plentiful in Virginia as to strip the oak trees bare," and that there was a similar outbreak, probably of the same insect, in Vermont in 1791.

Parker (1954) refers to an early outbreak of grasshoppers. "In 1740 grasshoppers attacked the scanty crops of the Massachusetts Colony. The colonists armed themselves with bundles of brush, and drove millions into the ocean."

With the expansion of Agriculture, insects attacking garden and field crops also received attention, beginning about the time of the Revolutionary War. This interest increased gradually at first, but expanded rather rapidly with the extension of settlement westward, the introduction of new crops, the increase of commerce bringing new pests. A considerable number of men, mostly farmers or fruit growers, ministers, physicians, or teachers, had their attention drawn to insect problems and recorded their observations. Before the appointment of Fitch and Glover to official positions in 1854, several men who can rightly be called entomologists joined this group of writers.

The first paper on economic entomology to be published in America seems to have been one on the Angoumois grain moth by Colonel Langdon Carter in 1771.

The man who may be called the father of American economic entomology was William D. Peck, professor at Harvard College. He published his first paper on injurious insects, an article entitled "The Description and History of the Cankerworm," in 1795. He was the author of five more papers from 1799 to 1819, discussing the slugworm, the cankerworm again,

insects attacking the twigs of pear and pine, borers in locust, and, finally, the oak pruner and plum curculio.

Thomas Say, the great systematic entomologist, published papers on the Hessian fly, the peach tree borer and the cotton caterpillar.

T. W. Harris published his first paper (on the salt marsh caterpillar) in 1823 and continued to write until 1860, publishing 93 papers. Miss Margarette H. Morris published on entomological subjects from 1841 until 1860, writing 23 papers; Howard (1930) considered "Her writings . . . popular and not very well founded, although she was looked upon at the time as an authority."

To show the extent to which economic entomology had received attention at the time of the appointment of the first "official" entomologists I have tabulated the number of papers dated 1854 or earlier which are listed in "The Bibliography of American Economic Entomology" (Henshaw 1895, 1896). I find that 258 papers by 102 different authors are listed. Of these, 11 papers by ten authors were published before 1800, four by four authors from 1801 to 1810 inclusive, 24 by 18 authors from 1811 to 1820, 42 by 18 authors from 1821 to 1830, 32 by 22 authors from 1831 to 1840, 46 by 19 authors from 1841 to 1845, 74 by 28 authors from 1846 to 1850, and 53 by 12 authors from 1851 to 1854 (14 by seven authors during 1854).

In the papers published from 1771 to 1840 inclusive 48 injurious insects or groups of insects are discussed. (One paper published in 1762 and said to discuss the "cochineal insects that breed on the *Cactus opuntia* or Indian fig in South Carolina and Georgia" is listed in the Bibliography.) The ones mentioned most frequently are cankerworms to which there are 20 references (three each before 1800 and from 1811 to 1820, five from 1821 to 1830 and nine from 1831 to 1840), the Hessian fly with 13 references (four each before 1800 and from 1811 to 1820, two from 1821 to 1830 and one between 1831 and 1840) and the seventeen-year cicada with seven references (two during 1811-20, three 1821-30, two 1831-40). Six insects are listed five times each: armyworms (one each 1801-10 and 1811-20 and two 1831-40), cutworms (three 1811-20, one each 1821-30 and 1831-40), the wheat jointworm (four 1811-20, two 1821-30, one 1831-40), the rose chafer (all during 1821-30), the plum curculio (one 1801-10, two each 1811-20 and 1821-30), and bark beetles (two 1811-20, three 1821-30), and four others four times each: the Angoumois grain moth (before 1800, 1811-20, 1821-30, 1831-40), the locust borer (one 1811-20, two 1821-30, one 1831-40), the peach tree borer (one 1801-10, two 1811-20, one 1821-30), and the sheep botfly (all during 1811-20). Six insects received attention in three papers each—cotton leaf worm (21-3)<sup>2</sup>, tent caterpillars (11-1, 21-2), flat-headed apple tree borer (11-1, 21-2), round-headed apple tree borer (21-2, 31-1), leaf beetles on tree (31-2), and sheep tick (11-3), and in two papers each—grasshoppers (01-1, 31-1), wireworms (11-1, 31-1), oyster shell scale (01-1, 11-1), unidentified scales (21-2), woolly apple aphid (21-2), white pine weevil (11-1, 21-1), scarab leaf chafers (21-2),

2. In these tabulations the frequency of mention in each of the four periods, 1801-10, 1811-20, 1821-30 and 1831-40, is indicated following the initial years of the periods.

grape vine flea beetle (31-2), and the bee moth (31-2). Twenty insects were each mentioned once only in these papers: before 1800—a sawfly on beech and willow, 1811-20—codling moth, oak twig pruner and carpenter worm, 1821-30—white grubs, salt marsh caterpillar, pigeon turrex, fall webworm, apple worm, pear borer, pear slug, imported currant borer, squash vine borer, pea weevil, cabbage maggot, turnip butterfly, larder beetle and horse bot, 1831-40—chinch bug and antique tussock moth.

Webster (1892) has given us a summary of some of the early observations on insects, especially those attacking field crops. He warns entomologists that they must be careful in reporting observations as "new" since some early writer may have already described the insect and its damage and/or published figures. John Josselyn gave rather accurate descriptions of the appearance and the damage caused by white grubs. Jacob Cist, in 1824, published an illustration of a fungus parasite of this insect. In 1822, James Worth published descriptions of damage to wheat by several insects including the joint worm and the wheat stem maggot, and of aphids feeding on the roots of wheat, corn and young trees. In 1829, a Thomas Emory discussed an aphid affecting wheat noting, "I believe this insect is the same as that known by the name of the root-louse in corn, so frequently found in that plant," indicating that this insect was well-known at that time. Rather complete descriptions of the symptoms of Hessian-fly infested wheat and illustrations of several stages of this insect were published in 1822, and quite surprisingly, late sowing was recommended as a preventive measure against this insect in 1799.

In 1841, T. W. Harris published the first edition of his book on injurious insects under the title, "Report on Insects Injurious to Vegetation." It was reprinted the following year and a revised edition was published in 1852.<sup>3</sup> This work included compilations of most of the available information on all the important plant pests, and included remedial suggestions. However, Howard (1930) who reviewed the control recommendations for 50 such pests thought "Doctor Harris was not by taste an *economic* entomologist. . . . he did not know agriculture, apparently, except for occasional reading, . . . and he introduced, I think, no new ideas as to remedies." Nevertheless, the time from 1841 to 1854 may be considered, I believe, a period of "semi-official" entomology. Harris' book was "prepared and published by the Commissioners on the Zoological and Botanical Survey of Massachusetts, agreeably to an order of the General Court, and at the expense of the State." Furthermore, he received pay from the State for this work. (The sum of \$175.00!) Also from that date more and more of the literature on insects and insect damage came from the hands of professional entomologists. In addition to numerous entries under the names of Harris and Morris, new and familiar names as LeBaron, Fitch, etc., appear in the Bibliography.

Although most of the serious introduced pests of garden, orchard and

---

3. The edition most common is the revision by Flint published in 1862. It is stated that "No alterations have been made in the author's language, and the additional notes are enclosed in brackets to distinguish them from those in the former editions." However, the "wood engraving which themselves marked an epoch in that art" (Howard 1930) were new.

field probably reached this country after 1854, many pests had already been brought from Europe. Most of the grain and stored products pests, household insects and animal parasites probably arrived with the early colonists and their possessions. Kalm stated in 1749 that "*The common houseflies* were observed in this country about 150 years ago as I have been assured by several persons in this town (Montreal) and in Quebec." There are definite records of the Hessian fly, codling moth, pear slug and pea weevil before 1800 and of the diamond black moth, cabbage maggot, pear psylla, imported currant worm and elm leaf beetle between 1800 and 1850.

Two fields of economic entomology, apiculture and sericulture, were not considered in Howard's History and papers in these subjects were not listed in Henshaw's Bibliography.

The development of beekeeping in this country may be said to be somewhat parallel with that of economic entomology. A real revolution in beekeeping occurred at almost the same time as the beginning of official entomology. The honeybee was apparently introduced into Massachusetts in early colonial days but until about 1853 the beekeeping methods in use did not differ materially from those used in the Old World for centuries. In 1851 Langstroth discovered the "bee space" and invented the modern hive based on this principle. About this time Quinby, using primitive equipment (without smoker or movable frame hive) made honey production profitable by developing methods of obtaining the honey without destroying the bees. J. E. Hetherington (later Captain and also reputed to be the world's most extensive honey producer of his time) began beekeeping in 1852 at the age of twelve years. In 1853, L. L. Langstroth, "the Father of American (or Modern) Beekeeping," published his "Hive and the Honeybee" and Moses Quinby, "Father of Commercial Beekeeping," published "The Mysteries of Beekeeping Explained," entirely independently of each other. The principles set forth in these two books provided an almost explosive expansion of beekeeping. Three years later Quinby and his associates produced for the market ten tons of boxed honey and created a sensation which rocked the beekeeping world (and glutted the New York honey market!). In another two years, Hetherington, now seventeen, was selling his honey by the ton and building up apiary holdings which were, eventually, to reach 3,000 colonies.

Sericulture was also introduced into America by the early colonists, but in spite of many waves of enthusiasm, it never established itself on a firm basis anywhere. One of the waves of great interest in silk production was moving through the eastern states for several years after 1830. An examination of several issues of a silk culture journal<sup>4</sup> published during 1835 reveals that societies were being formed in counties and cities throughout the northeastern states, that there was a silk factory of considerable size in Hartford and others being constructed elsewhere, and that people in almost every walk of life were taking up the production of silk. However, this movement had apparently almost subsided by 1854, only to be repeated at intervals for the next fifty or more years, especially in Cali-

---

4. *The Silk Culturist and Farmer's Manual*, "published monthly by the Executive Committee of the Hartford County Silk Society at Hartford, Conn."

fornia where the first recommendation for state assistance in the production of silk was made in 1855.

### Literature Cited

- BAIRD, A. B. 1917. An historical account of the forest tent caterpillar and of the fall webworm in North America. Annual Report of the Entomological Society of Ontario (1916) 47: 73-84.
- BENSON, ADOLPH B. 1937. The America of 1750: Peter Kalm's Travels in North America. 2v., 797 pp. New York, Wilson-Erickson. (This is the first American edition of Kalm's book. It is based upon "the English version of 1770, revised from the original Swedish, and edited, with a translation of new material from Kalm's diary notes." Some of the notes by Foster, translator of the 1770 edition, are included.)
- FELTER, HARVEY WICKES. 1927. The Genesis of the American *Materia Medica* including a Biographical Sketch of "John Josselyn, gent." Bulletin Lloyd Library, 26: 64 pp. (Extracts from Josselyn's "An account of two voyages to New England," published in 1672.)
- HARRIS, T. W. 1841. A report on the insects of Massachusetts injurious to vegetation, published agreeably to an order of the legislature, by the commissioners on the Zoological survey of the State, 8+459 pp. Cambridge, Folsom, Wells and Thurston.
- HENSHAW, SAMUEL. 1895-96. Bibliography of the more important contributions to American Economic Entomology. Parts IV & V. 167, 179 pp. Washington, Government Printing Office.
- HOWARD, L. O. 1930. A History of Applied Entomology (Somewhat Anecdotal). Smithsonian Miscellaneous Collections, 84: 545 pp., 51 pls.
- LANGSTROTH, L. L. 1853. Langstroth on the hive and the honeybee, a beekeeper's manual. 384 pp. Northampton (Mass.), Hopkins, Bridgman & Co.
- PARKER, J. R. 1954. Grasshoppers: A New Look at an Ancient Enemy. United States Department of Agriculture Farmer's Bulletin 2064: 40 pp.
- QUINBY, MOSES. 1853. Mysteries of bee-keeping explained: being a complete analysis of the whole subject. 376 pp. New York, Saxton.
- SLINGERLAND, MARK VERNON, and CYRUS RICHARD CROSBY. 1924. Manual of Fruit Insects. 503 pp. New York, Macmillan.
- WEBSTER, F. M. 1892. Early published references to some of our injurious insects. Insect Life, 4 (5-10): 262-265, 323-326.