THE HERITAGE LECTURE

Entomology — In Days of Yore (Atlantic Canada)

by

Ray F. Morris*

A knowledge of the past helps us in charting our course for the future. Last year, Dr. Paul Riegert delivered the first of our Heritage Lectures when he spoke on Thomas Nathaniel Willing, Pioneer Prairie Naturalist. Today, I am honored to have been invited to deliver the second lecture.

This year I hope to share with you the life histories of some of the prominent early entomologists who established our discipline in Atlantic Canada. Some were the pioneers of economic entomology — hence this lecture is especially appropriate to our symposium theme "Entomological Perspectives on Resource Management". It is a tall order, but I hope I can meet the challenge.

In the short time available to me I have to consider early entomological development in four provinces: Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island. Fortunately, entomological development had a similar pattern in all provinces. This is not unexpected as all provinces having a somewhat similar climate and vegetation have common insect problems which are rather distinct from those of other parts of Canada.

Entomology in Newfoundland

Let us look at Newfoundland first, it is the oldest and, for obvious reasons, I know it best. The first study of Newfoundland insects was made by the wealthy young British naturalist, Joseph Banks, in the 18th century. Banks is best known for accompanying Captain Cook on his voyage around the world from 1768 to 1771, but, few people realize that he had made an earlier voyage of 4 1/2 months to Newfoundland and Labrador in 1766 collecting plants, animals, birds and insects. His collections were recorded in 1971 by Dr. A. M. Lysaght in a book entitled *Joseph Banks in Newfoundland and Labrador 1766, his diary, manuscripts and collections*. Many of the specimens now in the Banksian cabinets in the Entomology Department of the British Museum lack locality labels and it is possible that some of these could be from Newfoundland, but confirmation of this awaits the inspection of the specimens by someone with experience of the Newfoundland fauna.

Another early pioneer in Newfoundland entomology was the famous British naturalist Philip Henry Gosse, who observed butterflies on Carbonear Island between 1832 and 1835. In 1882, Gosse wrote to William Saunders, Editor of the Canadian Entomologist, informing him how he had studied the insects of Carbonear very intensively for three years. He had made careful drawings of nearly every species he found and these had been bound in a book called *Entomologia Terrae Novae*. He felt that American and Canadian entomologists might be interested in the Newfoundland insect fauna and he offered to send Saunders the book.

The records of the butterflies from Carbonear Island were published in the Canadian Entomologist in 1883. Unfortunately, Saunders was not interested in the other groups and they were not recorded. However, in 1930, Dr. F. A. Bruton of Somerset, England, published a paper entitled *Philip Henry Gosse's Entomology of Newfoundland*. Bruton describes Gosse's Book *Entomologia Terrae Novae* as a small book of 60 to 70 pages containing nearly 250 beautiful hand-painted illustrations of insects, larvae and pupae. Bruton had the insects identified and classified by the British Museum of Natural History and they are listed according to order in his paper.

Entomologia Terrae Novae is now in the National Museum, Ottawa. None of Gosse's specimens are known to exist today — they are believed to have been lost during Gosse's visit to Mississippi in 1835. For me it was thrilling to look through Gosse's book at Ottawa in 1975 and to select one of his paintings, the short-tailed swallowtail, *Papilio brevicauda* Saunders, as a frontispiece for my book *Butterflies and Moths of Newfoundland and Labrador — The Macrolepidoptera*. It was hard to believe that such colorful and accurate illustrations were nearly 150 years old.

Shortly after Gosse's visit to Newfoundland, Norwegian naturalist, Peter Stuwitz, was sent to Newfoundland in 1839 by the Swedish-Norwegian Government and he stayed at St. John's until his death in 1842. Although his main task was to investigate the fishing industry, he found time to collect insects as he travelled around the island. These insects were sent

*Research Station, Agriculture Canada, St. John's West, Newfoundland

Philip H. Gosse, while working as a clerk with a mercantile firm at Carbonear, Newfoundland, from 1827-1834, collected insects and published his Entomologia Terrae Novae *in 1835.*

back to Norway and are still preserved at the Zoological Museum in Oslo. They are labelled "Newfoundland, P. Stuwitz", but unfortunately the localities are not included.

The North American literature on Newfoundland insects is very limited. Early partial lists were recorded by Bates in 1875 and Edwards in 1883 and early collecting records for Labrador were given by Møschler in 1860, Packard in 1868, 1888 and 1891 and Scudder in 1875 and 1895. Most of these entomological works in the earlier days were in the collecting and classification of insects.

The first native born Newfoundland entomologist was H.A. Butler. Graduating from Macdonald College in 1921, Butler was Deputy Minister of Agriculture for Newfoundland from 1931 to 1934, and then from 1937 to 1949, when Newfoundland was governed by a Commission, he was "Insect Control Officer". It was during this latter period that "H.A." developed his great interest in entomology. While seeking advice on methods and materials to control vegetable, household and forest insect pests, he made many contacts with officials of the Entomology Division of CDA in Ottawa.

In 1949, when Newfoundland became Canada's tenth province, "H.A." organized the Field Crop Insect Laboratory at St. John's and was appointed Officer-in-Charge, a position he held until he retired in 1957.

Although "H.A." published very few scientific papers during his wide and varied career, he made a major contribution in entomological extension throughout the province. In addition, he obtained and distributed throughout Newfoundland several millions of parasites to

combat such important forest pests as the European spruce sawfly, the spruce budworm, the larch sawfly, and the satin moth. He also introduced a bacterial disease that helped to combat a serious infestation of the hemlock looper.

I started working with "H.A." in 1950 and remember him best for his theories on the probability that insect larvae become airborne in southern areas, then carried aloft by wind storms, and literally fall out over Newfoundland. He has reported larval fall-outs on several occasions and has even found larvae in fishing boats anchored off-shore. When I offered a possible explanation or an alternative solution, he would retaliate and say "but how do you explain that one time, as I walked along Water Street in St. John's, the larvae actually fell from the sky and landed on my hat."

A silvicultural forest research unit at St. John's was established by the Federal Government in 1949 with a summer field station for forest insect and disease research being established at Georges Lake, Western Newfoundland in 1950 and 1951. During this period research on insects and diseases was initiated by Joe Carrol and Bill Parrot, and in 1953

First Canadian Forestry summer field station established at Georges Lake, western Newfoundland, 1950-1951.

they assumed responsibility for the Insect and Disease Survey. In 1952, the field station became a year-round operation, with permanent forest entomology and pathology units being established at Corner Brook. Accommodations at Corner Brook were provided by Bowaters until a new laboratory was constructed in 1956. In 1966, the two federal forestry research units in Newfoundland was amalgamated to form the Forest Research Centre at St. John's, and the Corner Brook laboratory was closed.

Early Entomology in Nova Scotia

The rather slow beginnings of entomology in both Nova Scotia and New Brunswick had their origins in taxonomic interests of non-professionals. Though Taxonomy is fundamental to applied entomology, the science of taxonomy in the Maritimes has never received federal government support.

The early history of entomology in Nova Scotia has been well described by Pickett and Payne (1939). Prior to 1882, little attention had been paid to the study of insects in Nova Scotia except by a number of private individuals. An early collection of Nova Scotia insects made in 1830 by Lieutenant Redman were mostly Diptera, and these insects are now housed in the British Museum. Collections of Lepidoptera, Coleoptera and Homoptera were made during the next 50 years by a number of individuals—Belt, Jones, Bethune, Silver and Downes. In

1896, H. Piers reported on the Orthoptera of Nova Scotia, and recorded an outbreak of the migratory grasshopper, *Melanoplus sanguinipes* (Fabricus), on Sable Island that caused a shortage of food for the native horses. As a result, shipments of hay had to be sent to the Island—this is one of the earliest records of the economic damage that can be caused to forage crops in the Atlantic Regions by insects.

Lord, F.T (1983) records three important insect collections in Nova Scotia:

(1) The collection of Professor H.W. Smith, started at Truro after 1886, was intended for student use. This collection continued to grow, particularly after the Agricultural College was founded in 1905. It was a fine, well-referenced collection under the direction of H.G. Payne, but unfortunately was lost in the tragic fire of 1946.

(2) The second important collection of N.S. species was also built up over many years at the Annapolis Royal Entomological Laboratory. Owing to the interests of G.E. Sanders, the collection contained some 3,000 specimens by 1919, and since then it has been greatly expanded by F.C. Gilliot and H.T. Schultz. The collection was moved to the new Science Service Laboratory at Kentville in 1951 and now contains approximately 10,000 specimens.

(3) The largest and best known collection in Nova Scotia is maintained in the Nova Scotia Museum of Science in Halifax. It was begun shortly after 1899 when Harry Piers, an orthopterist of note, became curator of the museum. In 1918, the museum collection consisted of 2,000 fully described specimens. The collection of Lucy C. Eaton and A.H.C. Richards had been purchased in 1906 and 1909. During the period 1934-1946, J.H. McDunnough, Chief of the Division of Systematic Entomology in Ottawa, collected Lepidoptera in Nova Scotia. From 1946 to 1965 the museum collection was further expanded by D.C. Ferguson. Barry Wright assumed responsibility for the collection in 1965 and added his large private collection of Paleoarctic and Nearctic Coleophoridae. By 1981, the museum collection had expanded to 325,000 specimens.

Economic Entomology in Nova Scotia

In 1865, the Provincial Government of Nova Scotia initiated the Nova Scotia Journal of Agriculture which continued publication until 1885. This provided a vehicle for dissemination of agricultural information to farmers, and some interest in insect control was promoted. The remedies contained in the N.S. Journal of Agriculture are perhaps more interesting as a record of control concepts than of successful remedies. As an example, here is a portion of an article concerning the turnip fly, *Delia floralis* (Pallen).

> "This insect attacks the infant plant as soon as it expands its cotyledons and sometimes destroys whole fields. Various remedies have been proposed, such as: burning the stubble; application of odorous manure distasteful to the fly; mixing seeds with sulphur; excessively thick sowing in the drill to provide for the insect and have a crop left; steeping the seeds in water to promote rapid germination; sowing hot lime over the young plants; watering every other day—five or six times if necessary; catching flies in tarred cloth; fumigation by burning rubbish to the windward of the field; drawing freshly painted boards over the field; an application of worm-wood; powdered sulphur strewn over the seed bed; snuff; and heavy rolling."

Although the practical value of these suggestions would not have been great, they do provide an excellent picture of the interesting remedies offered to farmers. However, the article contains one of the earliest known references to the use of sulphur as an insecticide in Nova Scotia.

The discovery in 1881 that the Colorado potato beetle had gained entry into Nova Scotia was a startling development for farmers and it prompted government authorities in Nova Scotia to take an active part in organizing the control of this very important pest.

The following excerpt is taken from the reports of the Central Board of Agriculture to the Provincial Secretary in 1882, p. 34.

> "During last year the so-called Colorado or Potato Beetle, which has been so destructive to the potato crop in other parts of America, has begun to show itself in Nova Scotia. The Board has collected information as to the best means of destroying it, which will be diffused among farmers at the proper season. Persons in whose neighbourhood the insect may appear are invited to apply to members of the Board for circulars or advice."

This and a further reference to the Colorado Potato beetle the following year appear to be

the only references to insects in the annual reports during the 21 years of the Board's existence (from 1864 to 1885). Since the Board reported on all matters dealing with agriculture, it is apparent that no severe outbreaks of insects occurred during this period. Losses from insects in those earlier years must simply have been accepted as unavoidable and natural.

The first instruction in Entomology was given in 1885, when Professor H. W. Smith was appointed lecturer in Agriculture at the Provincial Normal School in Truro. In 1888, a farm to be operated in connection with the school of Agriculture was purchased at the site where the NSAC is now located. In a report of the activities of the school for that year, Professor Smith specifically mentions entomology as one of the courses being taught, "Entomology is taught without any apparatus whatever to use: This is an important branch in this Province. A little assistance here would be a great help." In that year, twelve students were registered at the school.

In his 1892 report, Professor Smith made the following recommendations:

> "There is need for a good entomologist for the province, who would devote his time and energy to the fruit growers and farmers of the province. If employed as Prof. of Entomology in the Provincial School, he could visit local schools, conduct experiments and show farmers how to combat their numerous insect enemies."

However, it is worthy of mention that this recommendation was not acted on till 20 years later.

Smith reported on the prevalence and life histories of the cabbage maggot, wheat midge and wireworms in 1892, and two years later the Nova Scotia Secretary for Agriculture reported on the finding of scale insects attacking plums, peaches and gooseberries.

A course in economic entomology constituted part of the prescribed studies in the N.S. School of Horticulture, established at Wolfville in 1893. The Wolfville School of Horticulture, operated by a Board appointed by the N.S. Fruit Growers Association, was discontinued in 1904 and the work transferred to the College of Agriculture, Truro.

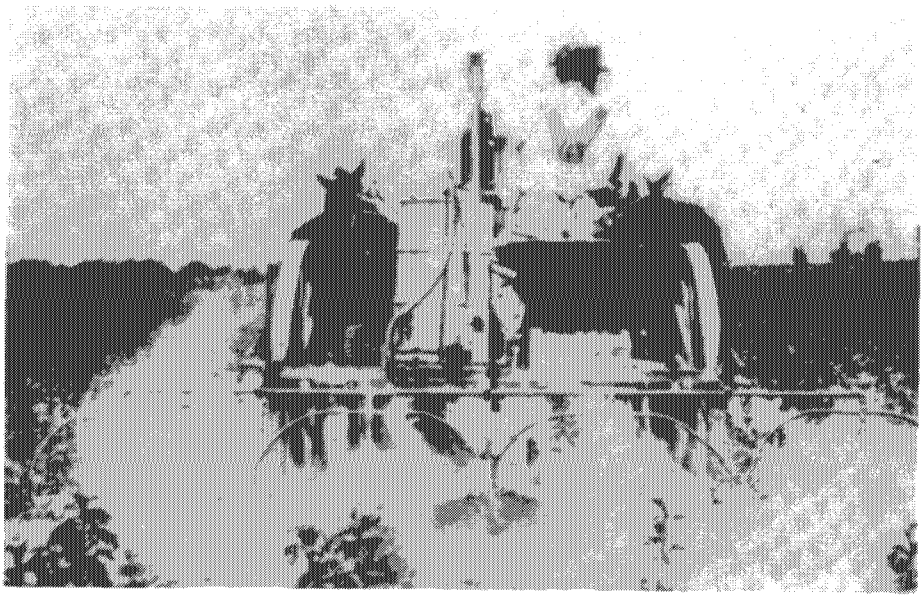
This was not the only activity of the Nova Scotia Fruit Growers Association. Organized in 1883, the Association provided a main source for distribution of information on insect control to growers. A trained entomologist was invited to speak to the fruit growers and in 1886 the address was given by Dr. James Fletcher, who was then Dominion Entomologist. This proved to be the beginning of a mutual liaison between farmers' experience and the research of plant pathologists, entomologists and chemists. Fletcher emphasized to growers *firstly*, the importance of using measures based on knowledge of the life history and habits of pests; *secondly*, knowing how to recognize them; *thirdly*, being aware of the best spray materials; *fourthly*, selecting sprays on the basis of feeding habits; *fifthly*, finding ways to make the poisons safe to use; and *sixthly*, having some idea of the role of parasitism, etc. We could not improve on this advice today.

Fletcher as Dominion Entomologist from 1884 to 1908 laid the foundation for entomology in Canada. He organized the Insect Intelligence Service, with 400 observers across Canada who reported periodically on noxious insects and remedies for their control. Thomas Nathanial Willing, the subject of Dr. Riegert's Heritage Lecture last year, was one such observer. Fletcher had many observers in the Maritime Provinces.

The report of the Director of the School of Horticulture for 1900 includes the results of experiments on the control of the forest ten caterpillar on apples by the use of Paris green. The report of the Principal of the School of Agriculture, Truro, for the same year announced the erection of a new building with special laboratories for the study of science subjects, including entomology.

The threat posed by the brown-tail moth, *Nygmia phaerrohoea* Don., led to increased activity in economic entomology during the early part of this century. Although the first brown-tail adult moth had been taken at Digby in 1905, this find was not noted at the time and it was not until April 1907 that the presence of this insect was first called to the attention of the authorities. For the decade following the brown-tail moth's appearance, extensive reports were given each year on this pest. Initially, control work was undertaken by provincial authorities, but they were soon joined by officers of the Dominion Entomological and Fruit Branches and the work of eradication was carried out on a co-operative basis. At first a bounty was paid for the winter nests but this was later substituted by spraying in infested areas and the gathering of winter nests by government officers. It may be of interest to note that although as many as 24,156 nests were taken in the winter of 1913-14, the numbers gradually decreased until the winter of 1926-27, which was the last year in which winter nests were taken.

In 1911 the *Injurious Insect Pest and Plant Disease Act* was passed by the N.S. Provincial Legislature and in July of the same year Regulations declared the following insects subject to the Act: San Jose scale, brown tail moth, gypsy moth and woolly aphids. In his report the same



Spraying potatoes for Colorado beetle control with one of the earliest potato sprayers, about 1919.

year, the Secretary of Agriculture urged the establishment of a laboratory by the Dominion Department of Agriculture in the Annapolis Valley for the study of the brown tail moth and other insects.

In October 1912, Dr. Robert Matheson was appointed Provincial Entomologist and Professor of Zoology at NSAC, Truro. It is believed this was the first provincial entomologist to be appointed in any province of Canada. Matheson resigned as provincial entomologist in October 1913 and was succeeded by W. H. Brittain who was to remain in Nova Scotia till 1929. Two important discoveries were made in 1912 and 1913, the San Jose scale being discovered in Nursery Stock in 1912, followed by the first official record of the apple maggot in 1913. Under the energetic direction of W.H. Brittain, investigations on the control of these and many important insect pests, including apple sucker and the green apple bug, were undertaken. Brittain became internationally famous for his pioneer studies on the cabbage maggot and on apple pollination.

There was little change in the manner in which the entomological work was carried on until 1926. In that year, Dr. Brittain severed his connection with the College of Agriculture and became Professor of Entomology at Macdonald College, McGill University. However, he continued to hold the position of Provincial Entomologist for a further three years, spending the summers in a study of fruit insects of the Annapolis Valley.

Another leading entomologist in Nova Scotia was Arthur Kelsall, who for many years was the dominant spirit behind the control of orchard insects in the Annapolis Valley.

In 1939, Kelsall became Superintendent of the Kentville Experimental Station and A. D. Pickett went to Annapolis Royal.

Another well known Entomologist was Allan Gordon Dustan. Born at Halifax, 1892, Dustan was educated at NSAC, OAC and Macdonald College. He was to serve for ten years in both Nova Scotia and New Brunswick before transferring to Ottawa in 1925 in charge of truck crop insect investigations. In 1915, he began his 37 years with the Entomology Division of CDA, then the Entomological Branch. He was appointed Assistant Field Officer at the Annapolis Royal Laboratory, under Mr. G.E. Sanders, and worked on orchard insects, particularly fruitworms and bud moths.

In 1928, Mr. A. D. Pickett was appointed Assistant Provincial Entomologist, and in 1929 he was appointed Provincial Entomologist following Dr. Brittain's resignation from that position. During the following decade, entomological work concerned itself with the establishment of a comprehensive spray service involving practically the whole of the fruit growing areas of the Annapolis Valley. In 1938, there were over one thousand fruit growers taking advantage of this service.

Entomology in New Brunswick

The Natural History Society of New Brunswick was organized in 1862, but most members were geologists and ornithologists. It was not until about 1884 that the first collection of insects was presented to the Society by Mr. H. E. Goold, who can be considered the pioneer entomologist of New Brunswick. A few years later, a Mrs. C. E. Houstis made a collection of insects near St. John and presented it to the Museum. About 1895 Wm. McIntosh began making a general collection of insects of New Brunswick and by 1918 it numbered about 19,500 specimens. The University of New Brunswick at Fredericton purchased the Preston collection which consisted of ten trays containing Coleoptera, Lepidoptera and Odonata, both native and exotic. The Dominion Entomology Laboratory at Fredericton, established in 1912, had a collection of Diptera in which the New Brunswick forms were well represented.

Many of the early leaders in Entomology in Nova Scotia and New Brunswick came from the Motherland and among these was John D. Tothill. He was born in London in 1888 and came to Canada as a young man to study at the Ontario Agricultural College where he specialized in entomology and botany.

Although Tothill's researches laid the foundation for biological control of insects and plant pests in Canada and also led to the establishment of the Forest Biology Laboratory in Fredericton, he was in the Atlantic Region for only 10 years, from 1912 to 1922. In 1911, he had been selected by the Dominion Entomologist, Dr. C. Gordon Hewitt, to direct the introduction of parasites of the gypsy and brown-tail moths into Canada, and was appointed a field officer of the Division of Entomology with headquarters at Fredericton, New Brunswick.

J. D. Tothill organized and directed the brown-tail moth survey and eradication program in New Brunswick, which was taken over by Dr. L. S. McLaine in the fall of 1913. In the spring of 1912, Tothill set up the first entomological laboratory in New Brunswick, on the campus of the University in a two-room wooden structure 6 × 15 ft.; this served as the centre for Natural Control Investigations, of which he was head, until a larger permanent brick laboratory was constructed under his direction in 1915-16.

J. D. Tothill was an exceedingly keen researcher and most inspiring and helpful to the staff under his direction. His work was always well organized and he was meticulous in making observations and recording data, a habit for which he gave credit to the Comstocks and Needhams, under whom he had studied at Cornell.

During the ten year period 1912-22, he organized and directed intensive research on natural control of the fall webworm, tent caterpillars, the spruce budworm and several other insect pests. He published a complete account of his work on the natural control of the fall webworm in Canada, but much of the wealth of information obtained during this ten year period remains in notes and unpublished reports. Throughout this period he continued research in taxonomy of Diptera and described a number of new species of parasites.

First entomology laboratory, a two room structure measuring 6 × 15 ft., established on the campus of the University of New Brunswick, Fredericton, by Dr. J. D. Tothill, 1912.

His studies on the spruce budworm, of which only reviews were published, and knowledge gained from an extensive survey of the damage caused to New Brunswick forests led to his efforts to develop official and public interest in planned management of the forests with biological control of pest insects as an integral part. This interest in biological control had been stimulated by his earlier researches on dipterous parasites of the Gypsy Moth and was to lead to the publication of his classic *The Coca Nut Moth in Fiji*, which followed from his secondment to Fiji in 1924 from Ottawa. From 1926 he was to work ouside Canada, mostly in Africa before retiring to Scotland in 1953.

Another outstanding New Brunswick entomologist was Raymond Paddock Gorham. A born naturalist from Gorham's Bluff, near Kingston, N.B., in 1885, Gorham received his B.Sc. at Macdonald College, McGill University, in 1911. During employment with the New Brunswick Department of Agriculture, in 1911-12, he co-operated with the Federal Entomology Service on the campaign to eradicate the brown-tail moth. During 1913-18, he was horticulturist at the Dominion Experimental Station, Fredericton, and assisted in planting the first arboretum there, (remnants of which still exist). After a short period at the University of Maine as a horticulturist, and as a Natural Science Teacher at the Provincial Normal School, Fredericton, N.B. he joined the Entomology Branch in 1919 to work on the spruce budworm study team at Nictau, N.B. Interestingly enough, his notes of that time comment on the hazards of *"unbalance associated with chemical control of forest pests."* Leaving N.B. in 1921, he joined the staff at Annapolis Royal, N.S. where he participated in the brown-tail moth work and fruit insect and insecticide studies for the next three years. Returning to N.B. as Officer-in-Charge of the field crop and garden insect section of the Dominion Entomological Laboratory at Fredericton in 1925, he remained there until his sudden death in 1946. He initiated agricultural entomology in New Brunswick, beginning the potato insect investigations that laid the groundwork for later studies on virus vectors in N.B. He also served as an extension entomologist when there was none on the Provincial Staff.

Gorham had a very great variety of interests, ranging from a fascinating fund of knowledge of Maritime history, especially agriculture, to almost an encyclopedic appreciation of animal and plant life of N.B. in particular. He was a prolific writer and a list of his manuscripts, published and unpublished contains 281 titles. He was a collector of plants and animals (including insects), Indian relics, and early editions. His intense interest in such a wide range of subjects often led to feelings of frustration and depression. In his lighter moments, he was a fascinating companion and story teller. In his death, at age 61 years, Canada lost another of the rapidly vanishing race of observant naturalists.

Following the death of Gorham in 1946, Jean Adams headed up the Field Crop Entomology Laboratory with a team of researchers that included: Ellen MacGillivray, Pond, Bradley and Dione. Adams studied aphid transmission of mosaics and leaf roll of potatoes and their impact on potato breeding and seed production. At the same laboratory, Charlie Maxwell and George Wood made significant contributions to our knowledge of insects of the lowbush blueberry crop and tree fruits.

Alfred Briggs Baird, a pioneer entomologist and an earnest architect of biological control in Canada, was born at Lake Stream, N.B. on October 11, 1891. A graduate of NSAC, OAC and Cornell, A.B. Baird began his career in 1911 as a seasonal assistant to Mr. G. Sanders on the brown-tail moth survey and in the following year (1912) he worked under Dr. J.D. Tothill in the newly established entomology laboratory at Fredericton.

After graduation from OAC in 1916 he was appointed field officer at Fredericton, where he continued working with Dr. Tothill on parasite introduction and the natural control of native pest insects. In 1918 he was transferred to Agassiz, B.C., where he did extensive research on natural control of the spruce budworm, the fall webworm, tent caterpillars, and the oak looper, all under rather primitive conditions and often with harrowing experiences. On his first trip to the budworm-infested area at Lillooet, B.C., he was mistaken for a revenue officer and for protection had to spend a night hidden behind the counter of the general store.

In 1921, after attending Cornell University, Dr. Baird returned to Fredericton where he studied parasites of the larch sawfly and the larch case-bearer, preparatory to the introduction of natural enemies from England. Leaving Fredericton in 1929, Baird became Officer-in-Charge of the new permanent laboratory for biological control work at Belleville, Ontario, and in 1948 transferred to Ottawa as Head of Biological Control, where he remained until retirement in 1956.

As a pioneer, and as a leader for over 40 years in the biological method of insect control in Canada, Dr. Baird never lost sight of the applied interests of his profession and to this end he maintained and greatly extended the work started by Dr. Tothill.

Entomology in Prince Edward Island

Between 1911 and 1919, entomology laboratories had been established in all provinces except Prince Edward Island. For years, entomology work in P.E.I. was the responsibility of R. P. Gorham of the Fredericton Laboratory and A. Kelsall of the Annapolis Royal Laboratory. However, since they had a full roster of duties in their own provinces they were not able to spend a great deal of time in studying insect problems on Prince Edward Island.

The year 1937 was a key year on the national as well as the local level. In that year, the Federal Department of Agriculture underwent the first of many major reorganizations, and Prince Edward Island was deemed by the Department to be in serious need of an entomology research unit.

Fred M. Cannon, a Prince Edward Islander who was studying medicine at Dalhousie University, and had spent his summers working as a potato inspector for the Seed Inspection Unit, was asked by the Science Service to consider studying entomology at Macdonald College to prepare for a career with the proposed unit at Charlottetown. Cannon accepted this offer, completed his B.Sc. at Macdonald in 1937, and obtained his M.Sc., in entomology in 1939. He was enlisted to organize the P.E.I. Division of Entomology in 1937 and remained there until his retirement in 1970.

Cannon surveyed the province to determine which pests posed the most serious threat to island agriculture. He conducted research into the control of the strawberry weevil, a particularly active fruit pest at that time. Screening a number of chemicals to control the pest, he finally demonstrated cryolite dust was the most effective product available. Soon, the chemical came into wide usage for this purpose in P.E.I. and Nova Scotia. Cannon also investigated the barley jointworm, potato insects, and root maggots, among other insect problems. He was often called upon to advise farmers on insect control, and this was an especially important service because at that time there was no one in the province's Department of Agriculture to answer such questions. Unfortunately, the old Science Service Building, which housed the Staff of Entomology and Plant Pathology as well as the insect collection, burned to the ground and the valuable collection of insects was lost.

Other Major Contributors

Mention was made earlier of the first Dominion Entomologist, James Fletcher, who held this position from 1884 to 1908, and who had a considerable impact on entomology in the Atlantic Region. Much of the expansion of the economic entomology services took place during the tenure of Charles Gordon Hewitt who served as Dominion Entomologist from 1908 to 1920. In this short period he developed the Canadian entomological service from a small division, attached to the Experimental Farms Branch, to an important separate branch of the Department of Agriculture. Through his initiative, the divisions of Field Crop and Garden Insects, Forest Insects, Foreign Pests Suppression, and Systematic Entomology were formed. He also established field laboratories at Annapolis Royal, N.S., Fredericton,

The old entomology laboratory, established in 1915, at Annapolis Royal, Nova Scotia. One of the first centres of insect studies in Atlantic Canada.

N.B. and in all other provinces across Canada. Dr. Hewitt was well endowed with character, foresight, ability and drive. He was a lucid speaker and writer and his charming personality and thoughtfulness endeared him to his officers and friends.

Tribute should also be paid to two other notable contributors to entomology in Atlantic Canada, Drs. A. D. Pickett and R. A. Balch. Pickett, following Brittain in 1929 as Provincial Entomologist for Nova Scotia, was an outstanding extensionist, teacher, researcher, director of research, and above all an early promotor of modern pest management systems. Pickett organized a team approach to orchard pest problems with researchers Patterson, MacPhee, Herbert, Lord, Butler, MacLellan, Sanford, Specht, Neilson and Chisholm.

R. E. Balch not only administered the Forest Entomology and Pathology Laboratory at Fredericton, N.B., for thirty years (1930-60), but had a distinguished scientific career. The strength of this Research Centre must be credited to Dr. Balch's sound judgment in recruiting young scientists, and to his innate ability to start a research program at precisely the right time, e.g. the Green River project with such notables as Morris, Miller, Watt, Wellington, Holling, Stehr and O'Brien.

Maine State University

Working as our neighbour to the South, I must mention two scientists at the University of Maine, Edith M. Patch and G.W. Simpson, both leading aphidologists whose work impacted upon Maritime Agriculture. Edith Patch, who started work at the University of Maine in 1905, was a prolific writer with 80 scientific papers, 40 popular articles on science and entomology, 100 works for juveniles on nature and insects, and 15 books. G.W. Simpson, a distinguished teacher, researcher and administrator, worked on aphids and their relation to the field transmission of potato viruses in N.E. Maine.

Acadian Entomological Society

No lecture on entomology in Atlantic Canada would be complete without a mention, however brief, of the Acadian Entomological Society—our host for this year's meeting.

Sixty-nine years ago, on August 3, 1915, a meeting was held at 2:00 p.m. in the Assembly Hall of the Normal College at Truro, N.S., to organize a society to be known as the Nova Scotia Entomological Society. It would constitute a branch of the then Ontario Entomological Society. The aims and purposes of the society were set before those present by Dr. W.H. Brittain, and a number of papers were also presented. Before the meeting closed, an election of officers took place. In 1920, Arthur Kelsall, then Secretary-Treasurer of the Society, had visions of a rapidly expanding group. In 1921, the name of the Society was changed to the Acadian Entomological Society and the first meeting outside of Nova Scotia was held at St. John, New Brunswick. With the reorganization of the ESC in 1950, AES was expanded to include all persons interested in entomology in Atlantic Canada and the state of Maine. Early history and development of the AES is fully described by Jean B. Adams (1965) in an article entitled: "Golden Anniversary, Acadian Entomological Society."

So started what is today the Acadian Entomological Society. This year's meeting also forms part of the Province of New Brunswick's Bicentennial Celebrations of 1984. ESC is pleased to help New Brunswickers celebrate this historical event, with the theme for this meeting "Entomological Perspective in Resource Management." I welcome the opportunity that this heritage lecture has given me to reflect back on the birth of Atlantic entomology, to a time when our developing provinces faced the problems of introduced insects without the professional skills and the chemical resources we now have available.

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