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Editorial – Four Men and a Moth

Of the 4000 or so species of Noctuidae occurring in North America, few are of any great economic importance. Most are unknown to the man in the street and even to the farmers they are most likely to influence directly. Yet we know a lot today in comparison with what we knew in 1911 when it first became apparent that the interests of the white man in North America were also the interests of one of these species, the pale western cutworm, then known as *Porosagrotis orthogonia* (Morrison). Most of what we know was discovered by as grand a quartet of entomologists as a single insect species could ever hope to attract: E. H. Strickland, William C. Cook, H. L. Seamans, and Larry A. Jacobson: the sequence is chronological; to distinguish between these men on any other basis would be improper. How little we knew of the pale western cutworm was exemplified by the disastrous recommendation to farmers by the Canadian government, to cultivate out all weeds before moth flight. This cutworm lays its eggs in loose soil, not, like some other noctuids, on the leaves of plants. But all this, and more, comes out in Jacobson's able, though modest review.

All these four men were primarily interested in the whole life-cycle of the whole insect; in its relationship to its environment, and in the problems it set for the farmer. In pursuit of these interests they, like the pale western cutworm, ignored the forty-ninth parallel. All four were men of strong views, given to speaking their minds. None who knew them would expect them all to agree on anything, let alone on such complex problems as this insect presented. Yet this very diligence in disagreement was the source of their strength as a group, for each sometimes proved another right; sometimes one suspects, by trying to prove him wrong.

Strickland, working from a Canada Department of Agriculture Field Station at Lethbridge, Alberta, when the trouble first started was quick to provide interim recommendations to farmers for control with insecticides. At the same time he was busy accumulating data on predators and parasites with a view to a more basic solution to the problem. Cook, assistant state entomologist for Minnesota, worked from there and at the Montana Agricultural Experiment Station. His major interest in the effects of weather and climate on insects conferred upon us the ability to predict outbreaks from weather data. Back in Lethbridge, Seamans applied Cook's findings in forecasting, developed practical methods for cultural control, and laid the foundations of our knowledge of feeding habits, rearing methods and nutrition. Jacobson, following Seamans at Lethbridge, took Cook's interest in the influence of weather into the laboratory and quantified the influence of several factors to yield a more definitive life history. He also developed the first effective chemical control, followed up on the work of Seamans on rearing, and contributed much on the behaviour of adults in the field and the laboratory. Jacobson, in this review, assesses the considerable contributions of others.

There have been times when superficial consideration of problems like that presented by the pale western cutworm has seemed to suggest that studies of the kind conducted by these four men are outmoded and redundant. The development of new and superior insecticides and technology for their application, of radio-sterilisation and plant breeding techniques seem to encourage such thoughts. But time has shown and will continue to show that there is no substitute for a knowledge of the biology of the insect and of the plant or animal on which it feeds. There will always be a place in applied entomology for the naturalist, for the man with a flair for revealing those features of the life of an insect which permit some finesse in our attempts to control it. Indeed I see this as the central function of an applied entomologist; as that which distinguishes him from a chemist and an engineer.

Despite what has been accomplished, it cannot be said, sixty years later in 1971, that the pale western cutworm problem has been solved. Though the value of crops saved exceeds by many times the cost of research done (none of these men made fortunes or even drew large salaries), the problem is still with us. And so it must be, for just as we select strains of insects resistant to our insecticides merely by using them, we also select strains of insects which damage our crops merely by growing them. And insects evolve so much faster than we do.

No better example of the dependence of applied entomology on basic entomology could be found than the pale western cutworm. The mistakes of 1911-1912 could be repeated at any time should our use of land change in favour of any of the other 3999 species of noctuid moths. We are very nearly as ignorant about the lives of most of them today as we were about the pale western cutworm in 1911; it would pay us to study them now.

It is a pleasure and a privilege to publish, on the eve of the 50th anniversary of the Department of Entomology at the University of Alberta, a paper which reflects so much credit on the founder of the department and on one of his students.

Brian Hocking