

### Wider aspects of a career in entomology. 8. The bug book and bug bottle

Hugh V. Danks

*This series of articles outlines some ancillary aspects of my entomological career, for the potential amusement of readers. It reports the sometimes unexpected challenges of working in new places and in the real world, an approach that serves also to expose some conclusions about research activities and some information about insects and their environments—although this article stems from a foray into popular entomology rather than from research work.*



In 1985, I agreed to write the text of a children's book on insects, provided I could remain involved in the project rather than simply submitting a manuscript. The venture included a collecting vessel<sup>1</sup>, and was initiated by Somerville House Books of Toronto. Later stages, including layout, printing and marketing, were carried out by Workman Publishing, a larger company in New York City. The first edition of the "bug book and bug bottle" (Figure 1) was published in 1987.

This article outlines my involvement, both for the general interest of entomologists and as a possible resource for anyone contemplating a similar effort. Even such an apparently simple book for children has many elements.

#### Concept

Young children are fascinated by "bugs" and would readily engage with a lively text, especially one that encouraged a hands-on approach. The entomological content was developed on this basis, but with a number of other goals. Overall, I wanted to take an overwhelmingly positive approach to arthropods and to introduce their ecological importance.

The taxa depicted would be relatively common so that the average child might encounter them, and would bring in striking details and other information of particular interest to the audience. I chose the taxa



Figure 1. The bug book and bug bottle (1987). Page size 5 x 4.5 inches [12.7 x 11.4 cm]. All pages copyright.

<sup>1</sup>The idea was well received, and led to many other packages, such as the bird book and feeder, and the beach book and bucket.

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also in support of another aim, to weave into the text a range of features often minimized for young readers because it is difficult to avoid unfamiliar technical words. Instructive elements would include diversity; basic traits such as the exoskeleton and the different developmental stages of metamorphosis; specializations of locomotion and vision; camouflage and other defenses against predation; behavioural features like stridulation; and the wider themes of interspecific interactions, sociality and migration.

In particular, too, the text, illustrations, and any ancillary materials had to be accurate as well as relatively easy to understand. I do not subscribe to the view, apparent in some products for children, that factual shortcuts are needed to simplify information for younger audiences.

It was important to make effective use of the “bug bottle”. Recommended activities not only had to be interesting but also fully feasible, so that projects could be completed without disappointment.

Safety was of special concern to the Canadian firm. Therefore, a “do not touch” icon was used to show not only arthropods that bite or sting, but also innocuous species that children might confuse with harmful ones. (The same icon also marked fragile insects that would be damaged by handling.)

### Writing and organization

Writing a text to deliver on these concepts was challenging. One key understanding, reinforced by my own family, was that an age level is not as closely circumscribed as might be thought, because children too young to read easily profit from a little help, and they comprehend a great deal when read to. Furthermore, still younger children could participate in the activities if given significant support by an adult.

In liaison with the Canadian company, the material was broken up into easily digested pieces to make it accessible. A separate page was devoted to information about each of 24 kinds of arthropods (e.g., Figure 2).

The pages were organized into four habitats, with six taxa each, to encourage outdoor activities. Arthropods that could be found in field habitats (Figure 3), on leaves, in ponds, and on the ground, were introduced.

Specific bug-bottle projects (e.g., Figure 4) were associated with a number of these pages. The projects were based on my own field experience with insects, including activities during childhood.

Some additional insects were mentioned on pages that treated biting flies (Figure 5), ants,



Figure 2. Sample page of the bug book, showing the leafhopper.

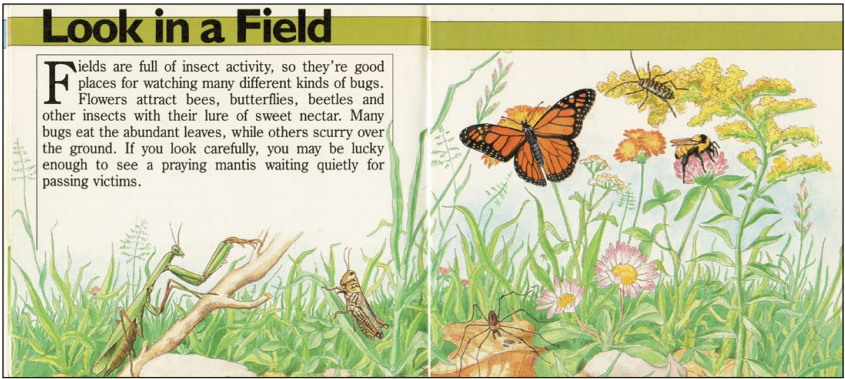


Figure 3. Introductory pages for the field habitat.

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## BUG BOTTLE PROJECT

**L**isten to the grasshoppers sing while they're in the field—they may not do so in your bottle. Many kinds sing by rubbing their wings and legs together. They sing best in warm sunshine.

**W**hen you see a grasshopper jump or fly through the air, watch where it lands. Stalk the insect, catch it in cupped hands and place it in your bottle. You'll find it easier to be a successful hunter on a cool, cloudy day, when grasshoppers are less active.

**W**atch the grasshopper produce a black or brown liquid from its mouth when it's disturbed. This liquid won't hurt you, but it does irritate the small animals that prey upon the insect.

**E**xperiment with several different types of grasses or other plants if your grasshopper is a fussy eater. Start with those that were around the grasshopper when you caught it. Watch how its jaws move from side to side when it eats, not up and down as ours do.

**P**lace the grasshopper in a large empty box and watch it jump. For their size, grasshoppers can jump as far as a man leaping the length of two football fields!

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Figure 4. Sample project page, for the grasshopper.

and remarkable facts (such as information on fireflies, and how the bottle could be used to observe them for a short time). Other pages gave background information: the importance of arthropods, the different major kinds, the nature of metamorphosis, and tips for using the book and bottle. A few selected words were listed as “bug terms”. The text used as many familiar words as possible, in relatively

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simple sentences, whilst trying for an active feel. Most unfamiliar and technical terms were avoided or reworded, although selected terminology was introduced deliberately. Therefore, every section required substantial redrafting and editing before the manuscript was submitted. This process took as much work as for the comparable stage of any of my scientific papers!

Figure 5. A page referring to biting flies.

## Bugs That Look for You!

**Y**ou won't need to search for some bugs. Instead, they'll come hunting for you! Female mosquitoes, black flies, horse flies and midges seek you out so they can take your blood, which they need in order to develop their eggs. Some kinds of

**D**id you know that flies land on you so they can drink your perspiration?

antennae to home in on your smell and to detect the warmth and moisture of your body. Their mouths have thin needles that pierce your skin to draw out the blood.

bugs, found mainly in the tropics, infect people with yellow fever, malaria and other dangerous diseases.

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A prototype of the bottle was also tested (Figure 6). The promoter wanted large air holes in the lid because purchasers would expect them, even though they would not be necessary for the recommended short-term uses. However, the diameter of the holes was reduced to hinder the escape of smaller occupants. A useful discovery was that a ventilated container steamed up less than a sealed one when leaves or other substrates had been added with the captures.

### Editing

The submitted text was checked by an editor chosen by the Canadian company. We disagreed about many things, through several iterations. Proposed changes simplified the language as if for very young children (below the age range I had targeted), bent the rules of grammar, included slang, and adopted a cutesy approach that seemed to me to talk down to the children. In addition, some local edits altered the meaning, and others changed the emphasis.

Unworkable activities were added because they would be “exciting”. For example, having learned that ground beetles can run rapidly, the editor put in a project where beetles belonging to different children would race each other, like racehorses—but then was reluctant to believe that the beetles might not run in a straight line when required, let alone in parallel. After having to delete a number of misguided alterations, I pointed out that neither facts nor activities can be invented just because they would be useful. Eventually, I even wrote: “... if you don’t know, don’t change it!”

The editing stage therefore took an inordinate amount of additional work as I strove to offset flawed editorial changes. Once, I even felt the need to comment that keeping a qualified author with a Museum affiliation would be a valuable selling point for the publisher!

Following these efforts, the “final” version was entomologically sound. The English too was more or less acceptable, although I was not fond of the language in places. Fortunately, the last word belonged to an editor with the New York publisher. Even before I knew of that editor’s role (although possibly she had seen my earlier comments), she returned the language towards my original style, eliminating most of the unwelcome changes.

### Illustrations

Featured species were illustrated by an artist who had not previously drawn insects. Therefore, his initial pencil sketches prompted many detailed comments. For example: typical antennal segments do not resemble a string of sausages, but each one has a narrower insertion at the base and then broadens; structures such as tarsal segments cannot be generalized, and nor are they necessarily identical on adjacent legs; impressionistic renderings of wing venation are inaccurate; insects look alive only if the wing position is correct. I had suggested appropriate species for the individual pages, and later sent on images of species and key structural details. The artist made excellent use of my comments, and moreover visited the Royal Ontario Museum to examine specimens.



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Figure 6. Paul Danks testing a prototype of the bug bottle in 1987.

One thematic illustration that had been drafted featured an attractive caterpillar on an attractive leaf, but the exclusively tree-feeding notodontid caterpillar did not belong on a ground-hugging plant rosette! My response to the editor's assertion that "no one will know" was that *I* would know.

At one stage the Canadian group came up with the idea of using black-and-white illustrations to reduce costs. I was happy when my belief prevailed, that the book would not be worth producing in this way because the item simply would not sell in competition with books illustrated in colour.

### Layout and page design

An attractive appearance for the book was created by designers at Workman Publishing, who developed the schemes exemplified in preceding figures. For example, text was neatly bounded by vertical rules, the different habitats were distinguished by header bands of different colours, and a bug-bottle enclosure highlighted each project. The bug bottle itself was labelled emphatically on a striking green lid.

### Cover

The publisher controls all features of a book cover to tailor it to a marketing concept. A major aim is to entice potential readers to pick up the item in the first place. Typical inducements are familiar: a well known *author* will be emphasized in bold lettering; the *title* will be carefully chosen to attract the target audience, or at least to be clever, cute, or otherwise engaging; the *design (including art)* will be appealing, and might represent the genre or echo the publisher's branding; *cover text* adds details about the content; *author qualifications*, or praise for earlier books, may be highlighted; and any *packaging* will be attractive. Here the title—The Bug Book and Bug Bottle—crisply revealed the concept. It was reinforced by cover text, and the book was neatly packaged inside the bottle.

The publisher chose to show cartoon-like images on the front cover (see Figure 1). I did not like them, and for a second edition (see below) a more insect-orientated cover with realistic-looking children was designed. Nevertheless, that cover was later returned to a cartoon style, because the original edition had been successful.

### Promotion

Workman Publishing did an outstanding job of promoting the book. Among other efforts, it was introduced at an important book fair in New York, and many copies were sent to appropriate publications for review. An effective carton was designed to display multiple copies in bookstores.

A major initial focus was a 2-week promotional tour arranged for me in the United States. I was first invited to New York, presumably so that, before investing in a tour, the team there could check that I was coherent! I took a taxi from my hotel to meet the publicist at a street corner near her office, and approached the person standing in the designated place, but was ignored. Extreme measures were necessary to attract her attention. "Oh sorry", she said, "I had my street face on." She explained that making eye contact with strangers on the streets of New York City can lead to trouble. In keeping with this introduction, we entered the office building through a lobby with security guards and locked barriers.

Later, during the tour, a driver stated that he could not help to unload materials, because an unlocked car left unattended downtown for the briefest moment might be driven off by someone waiting nearby for just such an opportunity. I appreciated Ottawa still more, with its lower crowding and less fraught conditions.

A major component of the tour was a series of "bug book" events. The publicist identified places interested in holding these affairs, and we developed a package with an introductory talk, a

game with the children, and a “bug hunt” in a suitable outdoor setting nearby.

My talk illustrated selected features of arthropods and amazing facts about them, emphasized their importance in the world, and explained how to find them and catch them in the bottle. Everyone who attended received a full-page participation certificate from the author, large numbers of which had to be signed in advance!

The game “bug bingo” followed the talk. It featured illustrations from the book, which were projected on to a screen as I called out each name. Participants would mark corresponding images on their game sheets (Figure 7), until someone completed a line and could call “bingo”. Winners came up to receive their prizes, which were various arthropod “species” made of plastic. The level of excitement increased as more and more children won, often simultaneously. Other game sheets, on which arthropod names could be matched with information or illustrations, were also available.

The subsequent field component encouraged children to look for specimens, capturing them if feasible. They would then ask me about them, prompting identifications and further information.



Figure 7. A sheet for the “bug bingo” game. Five different arrangements of illustrations were distinguished by paper colour.

Major events were held at the New York Botanical Garden, the Audubon Society of Portland, the Natural History Museum of Los Angeles County, the Field Museum in Chicago, and the Franklin Institute in Philadelphia. Most of them had substantial audiences. A newspaper in Portland reported that I had taken “about 170 excited children and 60 slightly less enthusiastic adults” on the bug hunt.

Thanks to the publicist, there was significant media coverage. The event in New York City attracted teams from major television stations and newspapers. It was repeated on the following day with another group of children. Many of the latter were unduly excited because they had seen coverage from the day before. Staying calm was even more necessary than it had been on the first day among the throng of camera crews and reporters.

Many journalists studied the book and bottle, spent time observing and filming the activities, and interviewed me to learn background details. Informative and positive pieces were aired on several different newscasts, and daily papers published articles.

There was one striking exception. As we entered the area in the New York Botanical Garden that served for the bug hunt, a gentleman came up to the gate. The staff informed him that the program was restricted to the children who had subscribed to it. His loud response was heard across the area: “You don’t know who I am?! ... I’m Chauncey Howell, ABC News, New York!” I had not seen him at the indoor activities, but he joined his camera crew for the bug hunt.

I was talking to a young boy about an insect he had found when Chauncey Howell, off to the side with the camera running, said to the boy “Say ‘Yuck!’”. The boy looked over and did so. “Why did you say that?”, I asked him; “Because he asked me to”, he responded. Neither our conversation about the insect nor his response to my question were shown in the broadcast, which began with a series of individual children, including the young boy, saying “Yuck!” “Yuck!” “Yuck!” “Yuck!” “Yuck!” “Yuck!” Evidently, this is how the broadcaster had chosen to gather information about our activities. He then intoned: “Cockroaches! They are probably inside your television set watching you right now!” The “news” item concluded with more gimmicks and many more words, although few of them were relevant to the event.

The publicist had been reluctant at first to send me to Portland, Oregon (“That area has only a million people”, she said!), but the Audubon Society was so keen that an event was held there anyway and was rewarded with great positive energy. Moreover, four television stations and two newspapers provided coverage. Apart from the ABC crew (which recorded some video early on by interviewing one of the local members, and then left), the teams stayed to the end, seeking information from me and compiling good footage around the pond that served as a focus for the bug hunt—despite the difficulty of preventing competing crews from appearing in their videos...

Similar activities on a smaller scale were organized in bookstores in several cities. However, the field component was often replaced with a book-signing.

The tour also included interviews, live and taped, on local radio and television stations. Nearly all of the hosts believed that they had to generate constant excitement, and seemed anxious to prevent more than a tenth of a second of silence. This hyperactivity, together with attempts to keep everything “lite”, made it difficult to ensure useful content. Beyond discussion of the book and how it could be used, I tried to refer to the importance and benefits of insects, and expose some striking facts.

One interviewer started by playing a recorded sound, and asked me what bug had produced it. I could not identify the kind of insect ... and then learned that the sound track had actually been assembled by combining the noises of bees, grasshoppers, and other species. The interviewer was pleased to be able to hype up such a good joke! It was helpful to remember the adage “any publicity is good publicity”.

Given the frenetic pace of the shows, most of these interviews were short. It was therefore especially worthwhile to participate as a guest on a 30-minute segment of a syndicated show for

young children, Kids America, then carried on national public radio. With careful preparation, positive professional hosts, appropriate pacing, and phone-ins by children asked to identify insect sounds for the prize of a bug book and bottle, the segment was popular with listeners.

In addition to my publicity tour, Workman Publishing distributed materials to promote active use of the product. Parents were encouraged to hold a “backyard bug party” with games and other activities, and bookstores were briefed on how to arrange their own “bug day”. Nevertheless, one chain of bookstores decided not to stock the book, declaring that because of the bottle it was too troublesome to shelve.

### Reception

The book received favourable reviews in publications for children and for their parents. It earned the highest rating from the Canadian Toy Testing Council, and a special “Get in Touch with Nature” award, for example.

This acceptance was reflected by excellent sales, and the book was reprinted many times. The bug book and bug bottle joined the ranks of the 200 best-selling children’s paperbacks of all time in about 1999, when U.S. sales exceeded 1.6 million copies.

Many children told me they had enjoyed using the book and collecting with the bottle. One comment from an adult recalled how heavily he had used it. Another praised “the clear, honest and generous way it had presented the world of insects to children.”

A message from a young child asked for an identification. However, the specimen had simply been dropped into an ordinary envelope and mailed, whereupon it was processed into small pieces by the postal service. Fortunately, the remaining fragments of cuticle were enough to show that it had been a bald-faced hornet.

A notable communication read: “My four year old daughter latched onto a copy of your bug book and now sleeps with it. She will not part with it even to let me read it to her ... I was able to get it away ... a few seconds before she got it back, but what I saw looked very valuable. In sum, your book is loved by someone who cannot read and has impressed someone who has read it for 5–10 seconds. Take it as you will, it is meant as a compliment.”!

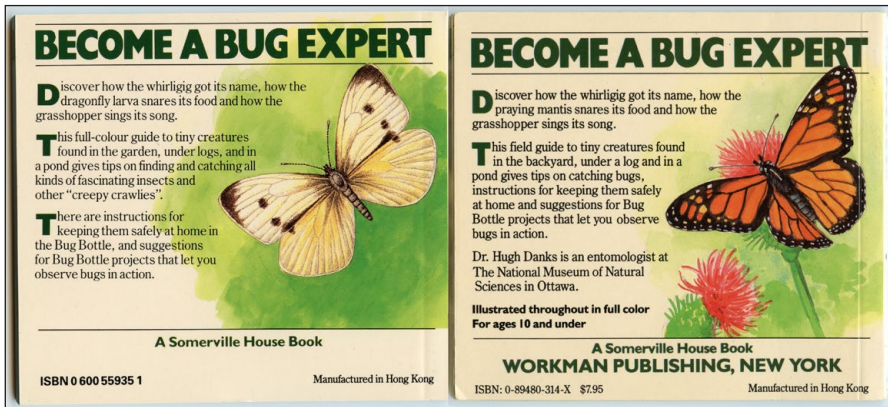
The book was used in schools, and sometimes a whole class sent me letters. One day the teacher of one of my sons brought in a copy, and asked questions based on the content. Obviously, she expected to provide most of the answers, but had not noticed that a pupil bore the same name as the author. My son was familiar with the material, and told me that he had answered the easy questions quickly before others could do so, but waited out the more difficult ones until others had failed, whereupon he could supply the information. After this exercise, the teacher, clearly frustrated, demanded to know “How come you know so much about bugs?”, giving him an opportunity he had anticipated. “Oh”, he replied, “my father wrote the book.” I hoped he had used a tone of voice that did not add to the teacher’s frustration.

An entomologist colleague once said to me that perhaps the widely used bug book had more impact than my more narrowly distributed scientific publications. I might not have wanted that to be true, given the efforts required for the latter—and after all, my scientific contributions did elicit some “fan mail” too!

### Foreign editions

Following the success of the book in North America, editions were produced in the United Kingdom, Austria, France, Sweden, and Australia, usually with minor adjustments to take account of different faunas. For example, although the monarch butterfly is well known in North America it is a rare vagrant in Europe, and was replaced in the U.K. edition with the common “cabbage white” (Figure 8). An antlion and other distinctive species appeared in the Australian edition.





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Figure 8. Back covers of the United Kingdom edition (L) and the North American edition (R) to show the change in one of the featured species.

I was unable to evaluate the translations into German or Swedish, but “translations” into Australian were familiar (and amusing) because my wife Thelma comes from Australia! Presumably to take account of the target audience, the text of that edition was simplified. Also, more complex ideas were eliminated, such as my deliberate mention of the fact that scientists claim more than one possible explanation for some features.

**Related activities**

The success of the book led to invitations to participate in other activities aimed at non-entomologists. I spent several days in the United States finding and “wrangling” insects to help with an insect video, and acted in a sketch about insects for a television station in Toronto. I was special adviser for two short videos produced by the National Geographic Society. One was aimed at older children, based on a story about the adult emergence of a butterfly. The video for younger children gave information about a variety of species through a rap song.

Work on a number of other productions revealed that consultants often have limited influence on content. In particular, many camera operators (notably for television) did not want to film anything “small”. The majority, who meant “anything smaller than a monarch butterfly”, had limited options.

**Second edition**

Many years later, Workman Publishing invited me to prepare a revised and substantially expanded version, catering to the human generation after the one that had used the first edition. That book (Figure 9), published in 2009, contained 110 rather than 64 pages. It covered nearly twice as many species (e.g., Figure 10), with flowers and woods as further habitats.

New information pages added details about several earlier themes, such as a section on the environment (covering beneficial species, environmental changes,



Figure 9. The revised and expanded edition of the bug book and bug bottle (2009). All pages copyright.

and helping the environment). Pages were developed on the terrestrial adults of aquatic species (Figure 11), bites and stings, nocturnal activity, social insects, and insect traces (feeding damage, galls, webs, nests, frass, and exuviae), as well as a project on species found indoors. Nine pages were devoted to guidance for a number of collecting activities (Figure 12), and more words were added to the list of selected terms.

Scale bars (both metric and imperial) were inscribed on the lid of the bottle, and inside together with the book were a bug journal (to record observations), a chart showing the taxa (facilitating identification and allowing those found to be checked off), and a magnifier (Figure 13).

Care was needed to finalize both text and artwork, as with the 1987 version. I interacted directly with a Workman editor to tune up the text. We differed temporarily when she introduced a few Americanisms, but I had to admit that most of the target audience was American! The artist prepared the illustrations through expert use of computer software, facilitating subsequent modifications. Again, I submitted images of suitable species and relevant structures, and commented on the drafts.

The added components were carefully considered. For example, choosing a magnifier required compromises to balance the size, power, focal length, optical clarity, and construction material with cost, quality, and ease of use by children. The feasibility of “amateur” versions of some of the collecting methods was tested (e.g., Figure 14).

That edition also won acclaim, such as the Gold Award of Parents’ Choice Foundation. However, I received relatively little direct feedback because most opinions and reviews appeared online instead. Some people noted that they had used the first edition as children and were happy

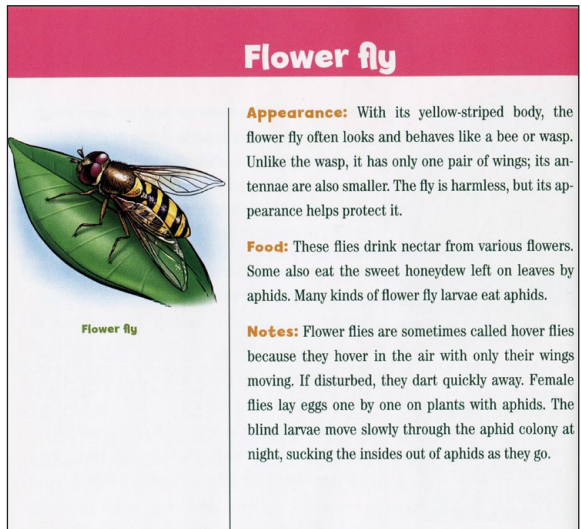


Figure 10. Sample species page from the revised edition, showing the flower fly.

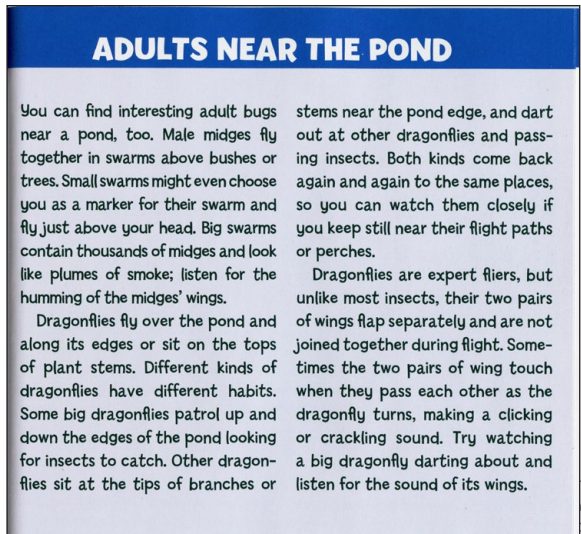


Figure 11. Sample information page, showing the first part of “Adults near the pond”.

## Collect Like an Expert

Entomologists catch insects in many different ways. Here are some tools and tips on how to use them, including the best ways to catch bugs that you might normally have trouble collecting. The first projects are easy to do by yourself, but the later ones may require special tools or help from an adult.

### Sifting

Sifting helps you separate many kinds of bugs from their habitats so you can get a closer look.

#### SUPPLIES

- A small white plastic tray or dishpan

#### DIRECTIONS

1. Spread some dirt, dead leaves, old grass clippings, or other material from the ground on the tray.

2. Shake the tray gently from side to side, and the bugs will move across it—making it easier for you to see and catch them.

To find pond bugs, do the same with bottom debris from a pond, but also add an inch of water.

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Figure 12. Start of the section about collecting methods, describing sifting.

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Figure 13. The items enclosed in the bottle for the revised edition; and a magnified image.

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to be able to buy the second one for their own children.

Many comments were gratifying because they confirmed not only that the book provided enjoyment and entertainment to children, but also that my overall concept (for both editions) had been appreciated. For example, one comment said “Author does not ‘talk down’ to the reader. Explanations are clear with excellent pictures”; another noted that the book was “clever, informative and fascinating” and “gives kids all the tools they need to become a bug expert, and in the process, develop a genuine understanding and respect for the natural world.” A reviewer wrote “As an educational tool, this is certainly a superior product ... easy to understand and not overly technical; just the right balance to encourage and inform, but not overwhelm or bore young minds.”



Figure 14. Author Hugh Danks testing a set-up for sheeting at night.

### Other benefits

Although my work on the original edition was done outside office hours (given my other commitments), an employee of the national museum could not be paid directly. The Museum agreed that the modest author’s revenue would be held in a trust fund earmarked for my research and other professional themes. A comparable avenue no longer exists, as administrators have sought to capture all revenues of this sort, a constraint that has reduced the willingness of some scientific staff to participate in wider activities. Fortunately, management could not retroactively change the agreement with me despite several attempts to do so.

The trust fund allowed me to support research with some other Canadian entomologists, contributing to a few joint publications. Also, donations to the ESC’s Scholarship Fund provided much of the capital for the student scholarship established on behalf of the Biological Survey of Canada.

Revenue from the second edition accrued to the Museum. However, that version was begun mainly during work hours and completed after my retirement.

An additional benefit of the ongoing success of the bug book was its contribution to public education themes favoured by my employer. Consequently, pressure to invest undue effort in other public programmes was reduced.

### Final comments

I enjoyed preparing both editions. It was very satisfying to develop products that were accurate, attractive, easy to understand, and content-rich, with activities that were appropriate and feasible. Every stage—planning, writing, editing, verifying illustrations, promotion, and feedback—brought valuable experiences beyond my scientific research. The marked success of the work, and the other activities it generated, were encouraging too.

Of course, such an endeavour depends on many people apart from the author, because a range of expertise is needed to ensure that the content is realized as an attractive product of high quality, and then marketed successfully. I was fortunate that members of the team at Workman Publishing, and the artists, were so skilled and effective.



I appreciated the variety of comments that children and their parents, as well as former children, sent to me over the years. Many people who had enjoyed using the book retained a positive attitude towards insects. Some kept a more active interest and involvement, and a select few pursued careers in entomology.

My experiences confirm several generalizations that are well known to most entomologists. Children are curious about the world and are fascinated by insects, but by the time they reach adulthood their enthusiasm may have been replaced with dislike or disgust because of ill-informed peers or parents. These negative attitudes are reinforced because some journalists do not try to provide genuine information, but in its place emphasize prejudices (“Yuck!”), use easy headlines (“Are you bugged by bugs?”), or repeat tired tropes (eccentric butterfly collectors and absent-minded professors).

Non-entomologists have a different perspective in any case. Many people have limited general knowledge about science, and so cannot grasp the context of much of the specialized information that is available. One non-entomologist’s response to my detailed monograph on insect dormancy, published the same year as the first edition of the bug book, was “Oh no. Not another of these big red books we can’t understand ... but this bug book is great!”

As a result of their lack of knowledge about science, many people fail to appreciate the complexity of the natural world and the need for precision in describing it. Their knowledge of insects may be confined to a few pests and conspicuous species. Unfortunately, some of the individuals charged with communicating the information (more than a few journalists, public programmers, and editors) have limited understanding too.

Given this setting, all scientists should try to encourage science literacy among the general public. For entomologists, the challenge has always been: how can we focus and maintain the positive attention of people of all ages on the fascinating diversity and natural history of arthropods, and on the global prevalence and importance of the group? I hope that the bug book helped with that wider aim.

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