

Forensic entomology is another choice in the crime-scene technician's bag of tools

An exclusive *Evidence Technology Magazine* interview with
Neal Haskell, PhD

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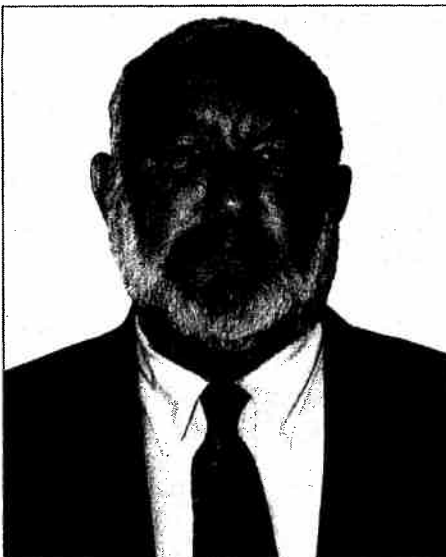
Dr. Haskell's interest in insects began during a 4-H science project when he was 11 years old. Over the years, this interest became (in his own words) an obsession. Today, he is totally involved in entomology and how it can be used to further the objectives of forensics. In our conversations with Haskell, we were primarily interested in how his expertise with insects can help those who routinely work crime scenes.

EVIDENCE MAGAZINE: *There are not too many experts in the discipline of forensic entomology. So what kind of advice would you have about this topic for crime-scene technicians?*

HASKELL: When the technicians go out to a homicide crime scene, they are faced with a tremendous task. Not only do they need to be looking for a gun, a knife, fingerprints, trace evidence, and blood...but now everybody wants them to look for bugs! My hat is off to them. They do a remarkable job with a small number of people.

EVIDENCE TECHNOLOGY: *What about the bugs? Any tips? What should they do...or not do?*

HASKELL: Well, if they have scattered skeletal remains or buried remains, the best people they can call are the forensic anthropologists because they are really skilled in that sort of thing. Most law-enforcement personnel have not had the training or the background for recovery or exhumations. So let the



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anthropologists do it. Just stand back, watch, and take notes.

EVIDENCE TECHNOLOGY: *That's it?*

HASKELL: Well, when I come in, it is not quite like that. I like to work with the technicians. I might say, "Look at this over here. I think there might be something bug-wise going on." I will do whatever I can to help. And when it is time to start collecting bugs, then we start collecting bugs together. But if a technician is all by himself, it's just more work. I've heard them say, "We do everything else and now they want us to collect bugs, too?"

EVIDENCE TECHNOLOGY: *How did you get started in this line of work?*

HASKELL: I had an early interest in entomology back in the 1960s. I went to college and majored in entomology—but I returned to the family farm and raised cattle and soybeans. While I was doing that, I was also active with the sheriff's department as a special deputy. I got involved in a lot of things, including firearms training and death investigation.

EVIDENCE TECHNOLOGY: *But how did you get back to forensic entomology?*

HASKELL: In the 1970s, there was a whole generation of farmers that went out of business. I was one of them. So I went back to Purdue University and asked my old professors what I could do to help in the way of entomology. One of them said, "You're involved in crime fighting, aren't you? Why don't you do forensic entomology?" And I thought, "Why not?" I could take my academic training and fight crime! That was the start of a wild ride and it just keeps getting better. It gets more exciting with every turn!

EVIDENCE TECHNOLOGY: *And did the family farm go away?*

HASKELL: No. We're still there. We have 800 acres. It's been perfect for my entomology pursuits. My next-door neighbor raised 20,000 hogs per year for the market. As far as research was concerned, anytime I needed a dead source, I had it right next door. If I wanted to do research, we would buy pigs that had something medically

A brief look at the background and experience of Dr. Neal Haskell

Neal Haskell earned a BS degree in Entomology from Purdue University in 1969. After farming for 15 years, he returned to Purdue and earned MS and PhD degrees in Forensic Entomology—the first such degrees to be awarded in the United States. Since that time, Haskell has assisted law-enforcement agencies around the world in nearly 800 cases which have had questions regarding insects. Haskell has also given hundreds of scientific lectures, seminars, and training classes to coroners, medical examiners, death-scene investigators, and others who could benefit from

valuable information and insights into entomological evidence that can be found at death scenes or on corpses. He is currently a Professor of Forensic Science and Biology at Saint Joseph's College in Rensselaer, Indiana. He is available as an independent consultant in forensic entomology for law-enforcement agencies across North America and Europe. He is a Board Certified Entomologist and is one of twelve Diplomates of the American Board of Forensic Entomology. To learn more about Haskell, go to: <http://www.saintjoe.edu/academics/biology/haskell.html>

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wrong that made them almost worthless on the market...and I could buy them cheap. We would sometimes put the dead pigs in the field as if a person had been murdered. Or if I just needed to put something out to do collections on insect fauna or to do training, the dead pigs were perfect. The insects are attracted to them.

EVIDENCE TECHNOLOGY: *And so you used your family farm for research?*

HASKELL: Right. We had a perfect place for research. Our first question when we started was: What kind of flies come to dead stuff? We didn't even know the answer to that question. We had some basic data, but nothing specific on a seasonable basis. That was the first thing we had to do: Determine what kind of insects we had in the area and whether there were seasonal differences. There were, of course. And our research back then gives us even more reliability today when we are estimating how long somebody has been dead. That is important because in some cases, I may be working on a seasonal basis rather than on a very short timeline. There are some very precise calculations with regard to growth development of insect larvae and adult insects.

EVIDENCE TECHNOLOGY: *Did your background in law enforcement help when you were getting started?*

HASKELL: Oh, yes. I was fortunate in two ways when I was getting started. First of all, I had been running my own business as a farmer for 18 years...so I knew how to get started on a job and how to get the job done. Second, I had been in law enforcement for years as a deputy sheriff and all the local law-enforcement officers knew me. There was one group that I needed to hook up with, however: the state coroners. And that's where I started.

EVIDENCE TECHNOLOGY: *What next?*

HASKELL: Well, I contacted the group of forensic pathologists at Indiana University and convinced them that forensic entomology could be a very useful tool for them in establishing how long somebody had been dead.

Entomological evidence can confirm or refute other elements of evidence found by crime-scene technicians. It pays off when the case goes to court.

They were interested. So we started building a database from coroners.

EVIDENCE TECHNOLOGY: *You built a database of homicides...?*

HASKELL: It wasn't the murder cases that we started with. In the beginning, I was studying known-time-of-death cases like this: Grandma goes to the store, gets her medication, comes back to her house, has a myocardial infarction and dies. But the grandkids don't find her for a week or so. And when they do, there is Grandma with maggots all over her face. In cases like that, we could chart the known time of death with actual humans and then correlate it back to what we were seeing with the dead pigs out there on the farm.

EVIDENCE TECHNOLOGY: *Okay...*

HASKELL: We were able to build a pretty good database. And I got a lot of experience that way. I think before I did my first real murder-case analysis and testimony, I had something like 35 or 40 cases under my belt, plus almost two years of research.

EVIDENCE TECHNOLOGY: *When was your first actual case?*

HASKELL: I had my first forensic entomology case back in June of 1981.

EVIDENCE TECHNOLOGY: *What are the chances that our readers might work with a forensic entomologist?*

HASKELL: Well, I work cases across North America and around the world. And no matter where the case is, I rely on these folks for their observations, their evidence-recovery abilities, and their reliability. They are my eyes and ears on a crime scene. There are not too

many of us out there who specialize in forensic entomology. There are fewer than a dozen that are really active.

EVIDENCE TECHNOLOGY: *Really?*

HASKELL: Yes. We have 14 people in our certified organization, the American Board of Forensic Entomology. There are three or four others out there who are not certified. And of the certified folks, probably only five do more than one or two cases a year. They are not really very active on a regular basis.

EVIDENCE TECHNOLOGY: *If there are so few forensic entomologists out there, how do you cover all the cases?*

HASKELL: I can't get to every crime scene in a timely fashion, so I have to rely on the crime-scene investigators who work the scenes. And let me tell you: There are some really good technicians out there who are very detailed in their observations, recovery, labeling, and chain of custody. Their documentation is critical.

EVIDENCE TECHNOLOGY: *Are you able to give them any orientation in bugs?*

HASKELL: I try to give them a little background on entomology. Sometimes, I give a two-day maggot school...

EVIDENCE TECHNOLOGY: *A what?*

HASKELL: A maggot school. We have a great time examining the dead things out in the field. We do a lecture and then go out in the field and do hands-on examinations. As a matter of fact, I have a maggot school scheduled here in Rensselaer, Indiana on June 3 and 4.*

EVIDENCE TECHNOLOGY: *Go on...*

HASKELL: The maggot school helps the technicians get oriented so they can recognize what is the important stuff and how to get it to me in the right condition so I can do the best possible job for identification. Sometimes, the identification can be quite intensive. If the crime-scene technicians do everything right, there will be less chance that something gets muffed up. I rely on them highly. I do manage to get to my fair share of death scenes—maybe 10 or 15 a year—and I will personally do the collections on those cases. But the technicians usually do it.

EVIDENCE TECHNOLOGY: *This sounds like it could get complicated...*

HASKELL: Here's what the technician must know: Entomology is not magic. It is just simply another forensic tool. But it is a tool that can set some very important and very specific timelines: How long has the person been dead? Or has the person been moved? Or has the person been taking drugs? All of those questions can be answered from an entomological standpoint. Actually, it can work in interesting ways. For example: Let's say there is a suspect who is saying, "I didn't do it. You can't prove it." But then we come along with the entomological evidence that has an independent timeline—and suddenly, the suspect says, "Okay, let's make a deal. I'll spend the rest of my life in jail, but don't kill me." That has happened numerous times. Look at it this way: It is entomological evidence that can confirm or refute other elements of evidence that crime-scene technicians have pulled together. It pays off when the case goes to court.

A survey showed that 92 of 100 cases over a ten-year period involved blowflies as the primary indicator species.

EVIDENCE TECHNOLOGY: *Specifically, what kind of bugs are we talking about?*

HASKELL: We have some very specific insects that most of your readers will recognize. It is a group of flies called *blowflies*. They are easily recognized by their shiny metallic green-and-blue coloration. There are about 90 different species of blowflies in North America, of which 40 to 50 species have come up in forensic investigations, depending on what part of the country you are in. There are western blowflies, eastern blowflies, northern blowflies, and southern blowflies. We have some blowflies that start off in the south and

come north during the summer—and then the cold temperatures kill them. We have some blowflies that are found only above 5,000 ft. in the Rocky Mountains. And then we have other blowflies that are found ubiquitously across the United States. Generally speaking, blowflies are what you see around the dead animal that got clobbered out on the highway. And after a couple of days in 85°F temperatures, it is nothing but a mass of maggots—which are the blowfly larvae.

EVIDENCE TECHNOLOGY: *Interesting...*

HASKELL: Those are the flies that we are usually dealing with. There are others, of course. But blowflies are the most important. I did a survey of 100 cases over a ten-year period. And 92 of 100 cases involved blowflies as the primary indicator species.

EVIDENCE TECHNOLOGY: *How quickly do the maggots or larvae appear?*

HASKELL: One of the nice things about blowflies is their predictable behavior. If the environmental conditions are favorable—above 50°F but primarily in the 70s, 80s, or 90s—a dead body will have blowflies on it within 20 to 30 seconds after death. Basically, the female blowfly is checking out the fresh dead body to see if this is where her young ones can grow. There will be egg masses piling up within the first hour. It all happens very quickly. Blowflies are specifically attracted to dead, decomposing animal carrion, the soft tissues of vertebrate animals. And humans are included in that category.

EVIDENCE TECHNOLOGY: *And this all happens within minutes of death?*

HASKELL: Blowflies will usually be laying eggs within minutes after the creature dies. Now, there can be some delays. If it is 30°F or below, you will not have blowflies coming around. Or a cool rain can suppress egg-laying activity. And they don't go out at night. They stop activity at sunset and come out again sometime after sunrise.

EVIDENCE TECHNOLOGY: *What other kinds of bugs are there?*

HASKELL: Well, we have other groups of flies that will be attracted to a dead body. There is a group called *coffin flies*... sometimes called *scuttle flies*.

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They are little gnat-like flies. And they are interesting, too. I had a case where a victim was killed and put into a plastic garbage can and the garbage can was put into a rental storage shed. Two and a half years later, the remains started to drip out of the can. The owner of the rental facility smelled the odor, opened up the shed, and saw liquid coming from the garbage can. He opened it up—and then called the cops because he could see the remains. The suspect in this case was a family member who admitted that she had put the victim into the garbage can...but that she had had nothing to do with the victim's death. The prosecutor in the case sent me samples of the bugs they found in the body. They were coffin flies. Only coffin flies...nothing else. To me, this indicated that the body had been placed in the garbage can immediately after death. Why? Because if there had been a delay, then there would have been signs of blowflies. But coffin flies are so small that they can get in almost anywhere, even into a closed garbage can. This evidence contradicted what the suspect had claimed. It indicated premeditation. At trial, the suspect was found guilty.

EVIDENCE TECHNOLOGY: *What else?*

HASKELL: With bodies that are left out-of-doors, there are a lot of different insects that can get involved. Beetles come in and eat the fly eggs and maggots. Other beetles come in to eat the actual bodily remains. There is a regular procession of insects to the body as the biochemical composition of the body changes: the acidity changes, the pH changes, all sorts of biochemical changes take place over time...and different insects exploit the food source at different times. There is a progression of decomposition and associated changes in the types of insects that you will see at any given time.

EVIDENCE TECHNOLOGY: *What about a buried body?*

HASKELL: The burial provides a barrier, of course, thereby excluding most of the critters. But the body is usually exposed to some type of insect colonization before the perpetrator finishes the burial—so we will probably find something on or in the remains. Other

times, the bad guy will bury the body in a very shallow grave—and rain and erosion will open up the grave, providing access for insects and animals.

EVIDENCE TECHNOLOGY: *Where are these insects usually found?*

HASKELL: The primary areas for the initial egg-laying are nose, mouth, and eyes. That's because we have moisture in the eyes and we have the gasses or odors coming from the mouth and the nose that attract the flies. So buried bodies are interesting. They will often have some sort of insects on or in them. There was once a case where the body was buried 7 ft. deep with a backhoe. One of the perpetrator's buddies ratted him out or else the body never would have been found. The perpetrator's defense was that he killed the guy and was so scared that he immediately buried him. But upon examination, we found traces of blowflies and other insects—and that told us that the body was exposed above ground for several hours. Burial was not instantaneous. I

only got four bugs from that body. But two of them were blowfly larvae. We could identify the season of the year: It had to be July or August based on one of the bugs. And then there had to be three to four hours of above-ground exposure for the other bug to place eggs. We didn't expect to find anything when we first started the case. But you want to look. You may not find anything—but what happens if you do? It is called *thoroughness*. You've got to be thorough.

EVIDENCE MAGAZINE: *Do you have any final comments to share with us?*

HASKELL: I would like to repeat that the crime-scene technicians I have met are exceptional people. The challenges they face are almost insurmountable because of the pressure they get from the media and the public. Just tell your readers to keep up the good work—and when they do, forensic science will keep getting better and better!

EVIDENCE MAGAZINE: *Thank you for speaking with us today.* ☺☺



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