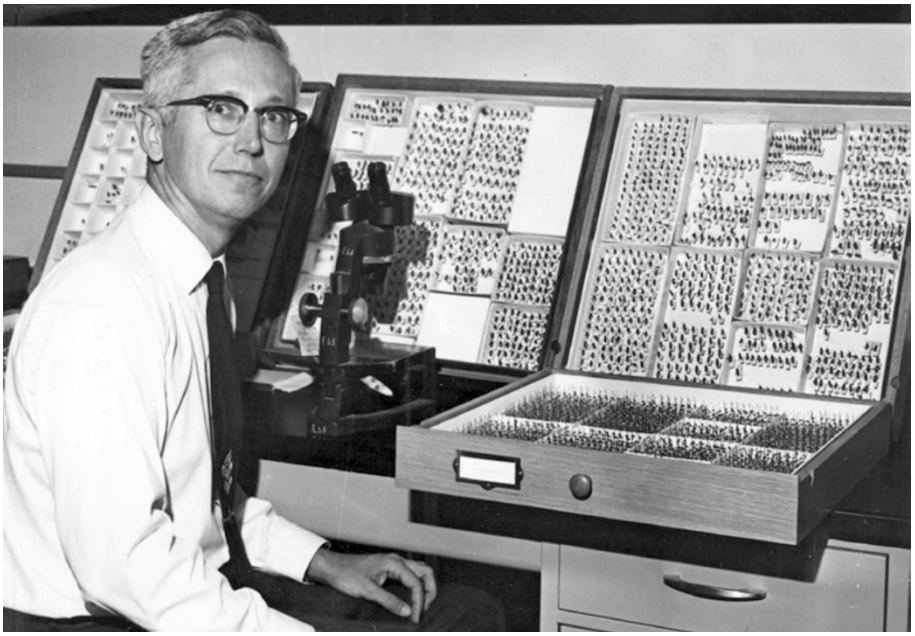

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Q&A Charles Michener
A life with bees

Charles Michener has been studying bees for more than 80 years, and, although he has seen many changes in the field, his interest in these insects has not diminished. Now aged 96, he contributes to bee research as a Watkins distinguished professor emeritus at Kansas University in Lawrence.

What sparked your interest in bees?
I was brought up in Pasadena in southern California, where I spent hours studying wildlife. I drew as many of the native flowering plants in bloom as I could. At about age ten, I ran out of new plants to draw, so I started collecting and drawing insects. I made more than 1,200 sketches, many of them of various types of bee. There was one bee in particular that probably lead to my fixation. It was a minute *Perdita rhois* Cockerell, a beautiful yellow-and-black insect that was attracted to the daisies in our yard every summer.

How did you turn your childhood fascination into a research career?
After completing my PhD in North American bee genera at the University of California, Berkeley, I spent several years studying other creatures. In 1942, I was hired by the American Museum of Natural History in New York to work on Lepidoptera — butterflies and moths. However, my supervisor liked the fact that I had my own interest, and so allowed me to continue researching bees and to publish my findings. He had previously worked on bees, which probably played some part in allowing me to continue, but I suspect that even had I been working on beetles, he would have welcomed my study.

In 1943, I volunteered for the Army Sanitary Corps. My first assignment was in Mississippi on mosquito-borne diseases. After a year I was sent to Panama to study the chigger mites (Trombiculidae) that were transmitting scrub typhus in the Pacific and hurting the US war effort by taking people out of action. As I travelled, I continued to collect bees and even publish papers — including one of the first papers on bees in Mississippi. While I was in Panama, I saw stingless and orchid bees everywhere — it was my first experience with neotropical bees and lead to the publication in 1954 of *Bees of Panama* (Literary Licensing).

When you left the service, what attracted you to Kansas?
I realized that to undertake bee biology studies, I needed experience in wild-bee behaviour and nesting habits. The University of Kansas offered this opportunity, so I moved to the state in 1948 and have never looked back. My work there enabled me to contribute to finding solutions for pollination problems, especially in alfalfa seed, which has a particular connection with bees. Without bees, alfalfa produces little seed. In the presence of honeybees, alfalfa produces some seed — but nowhere near optimum. The maximum yield is produced when native bees — bumblebees and leaf-cutter bees — pollinate the plants. Our solution was to provide nesting materials in the fields for the native bees. For bumblebees, this meant small boxes in which they could establish colonies. This is now the standard method for farming alfalfa seed.

What are the biggest changes you have seen in bee populations and in bee research?
In earlier years, people rarely collected numerical data on populations. They noted when a bee species was abundant or scarce, and that was about it. So to show any change over the years is difficult because initial data are not there.

People are still discovering new species of bee. In some cases this may be the result of a species simply migrating to a new area, but usually there is no way to know. Bees are highly susceptible to changes in the natural environment. The geographical range of various species will have to be tracked more carefully, which will be difficult to do.

In terms of research, there have been a host of changes within studies of social behaviour and understanding of caste determination, that is, among workers, drones and queens. But the biggest change is the ability to relate everything to systematics — the organization of bees into families, genera and species based on morphology and now on DNA. For example, honeybees nest in large families; leaf-cutter bees nest alone in burrows in the ground or in wood. Every feature of bee behaviour, physiology and ecology helps to reinforce the classification based on morphology.

How has the perception of bees changed throughout your career?
People have a better understanding now of the economic value of bees, because researchers like me are talking about the importance of bees for crops. And it is not just about the honeybee, of which there are only nine species. There are hundreds of other bees that have an impact through pollination on agriculture and natural vegetation, which were previously under-appreciated.

What are the main challenges faced by bees?
The biggest problems are ecological, such as the destruction of natural vegetation. More and more studies indicate that human interferences in the environment — such as through climate change and spraying pesticides on flowering crops — are strongly influencing the decline in abundance or the extermination of various bees.

It has been 80 years since the publication of your first paper. Will there be any more?
Yes. I have a paper in press, due to be published this year, about a new species of bee in Thailand discovered by my collaborator and former graduate student, Natapot Warrit. ■

INTERVIEW BY JULIE GOULD