Wider aspects of a career in entomology. 4. The high Arctic continued

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.

My fieldwork in 1969 as one of a group of entomologists and vertebrate zoologists at Polar Bear Pass on Bathurst Island (see the previous article in this series [ESC *Bulletin* **50**: 115]) continued as winter came to an end. Eventually, the temperature rose above freezing. Acclimatized to the cold as we were by then, some of us pranced around in shirtsleeves rejoicing in the +4°C warmth. Even so, the weather remained unpredictable. Snow, rain, and sunshine could be seen simultaneously across the horizon on more than one occasion. Entomologist Bob Byers and I continued to explore, whatever the conditions, as we tried to collect more arthropods.

The winter snow had been redistributed and packed hard by the fierce winds, so that it was not possible to distinguish between a shallow layer of snow, as in a slight depression, and a deep accumulation in a watercourse. However, the hard-packed snow softened rapidly as the weather warmed up. In these circumstances, snow that was firm enough to support the weight of a hiker on the outward journey might suddenly give way during a return later in the day. It was therefore possible to drop thigh-deep into the snow that had collected in creek beds. I liked to carry an ice axe during that period, because it would provide useful leverage to get back out. The wish to avoid being stuck there for long was reinforced by a realization that lying on the snow like a seal would not be the ideal pose for an encounter with a polar bear.

In fact, polar bears often passed through between inlets on the east and west coasts of the island—hence the name Polar Bear Pass. Mammalogist David Gray was alone on ridges for long periods while he observed muskoxen, and had brought a husky dog to accompany him. The dog would provide an alert about approaching bears, and help to distract one if it came too close. (A rifle would be used only as a last resort.) The husky was generally tethered at its station just outside the hut whenever it was not out on polar-bear duty. It spent most of its time there on two activities apart from sleeping. First, it could amuse itself by watching the numerous lemmings, which were at their population peak. Not uncommonly, a lemming track could be seen on the snow but would end suddenly just where the dog was at the limit of its tether. A second, longer-term, activity of the husky (perhaps because it was not used to being the only dog) was howling. Later, it proved to have been pregnant.

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Fig. 1. Meltwater flowing through the top part of the snowpack above a creek (27 June 1969).

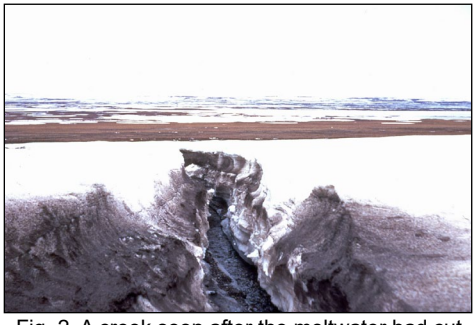

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Fig. 2. A creek soon after the meltwater had cut down to the bed (30 June).

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Fig. 3. Lower part of a creek flowing into the sedge meadow, with lake beyond (4 July).

In due course, the softened snow in creeks melted further and water began to flow in the top part of the snow pack (Fig. 1). Within a few days it had cut down to the streambed (Fig. 2). Such creeks supplied water to the wetland (Fig. 3).

On a few occasions a Single Otter aircraft came to the camp (Fig. 4), for example to pick up two members of the group who left before the others. Normally, the plane landed into the wind near the end of the camp ridge and was stopped almost instantly by the powerful breeze, coming to rest just beside our accommodation. One day, however, the plane arrived when it was unusually calm. We indicated this to the pilot with a "windsock", but perhaps he did not see it and landed in the usual place. After touchdown, the aircraft ran on and on without stopping. It passed the end of the ridge and started down towards a place where taking off again would be very difficult. Moreover, below the ridge-top the terrain was still wet from the thaw and hence soft enough for the wheels to dig in, which would have led to disaster. Just in time, the pilot gunned the engine and the plane staggered back off the ground and dropped into the valley. Before it reached

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Fig. 4. Single Otter aircraft coming in to land on the camp ridge.

the bottom, it had gained enough airspeed to generate the lift needed to climb back up. The pilot then circled and circled, and circled again before touching down, to make certain that he had an exceptionally long landing strip...and perhaps to recover his composure! Many local flights in the Arctic are made possible by pilots with a high tolerance of risk.

The severe conditions and remoteness of arctic areas make all operations there relatively risky, of course. Therefore, field camps were instructed to make scheduled radio contact every day with personnel from the Polar Continental Shelf Project at Resolute. That radio link was sometimes tenuous, in which case our scheduled contact was made through a field camp of geologists on another island who could exchange somewhat clearer transmissions with both Resolute and us. Often, I was the one trying to make contact because my voice was deemed to transmit effectively. When I was told (both then and later) that my voice is distinctive, I hoped that a compliment was intended!

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Fig. 5. Snow on 11 June above the main study pond, which is delineated by wooden stakes; the scale is suggested by the rolled-up surveyor's metal tape, about 30 cm in diameter.

Bob Byers and I carried out research on insect cold hardiness in addition to our general collecting. Bob worked under difficult conditions mainly to prepare and embed tissues for later cytological examination. I studied especially the larvae of chironomid midges in a shallow pond, the same sort of habitat I was studying farther south. In the Arctic, such ponds are frozen solid during the winter, unlike my recent discoveries near Ottawa that many habitats remain unfrozen then. While the pond was frozen (Fig. 5), a steel ice chisel (illustrated in article 2 of this series [ESC *Bulletin* **50**: 50]) served to gain access to the pond bottom. On the first such occasion, I pushed aside the snow and struck a firm blow with the ice chisel, using the full width of the blade and a nearly upright orientation, just as in temperate conditions. However, the arctic ice was so cold that it was as hard as concrete; the first blow jarred my hands painfully but made virtually no impression on the ice. I had to invent a different technique using the corner of the blade, although fortunately the ice gradually became less hard farther from the surface because it was less cold. Access to the substrate allowed me to remove completely frozen samples that contained chironomid larvae. The samples were placed in a large cooler so that they would remain frozen until they could be shipped back to Ottawa.

As the season advanced, the pond started to melt (Fig. 6a) and then thawed completely (Fig. 6b). Habitat temperatures were monitored in spring and early summer with a thermograph powered by a battery pack (visible in Fig 6a). This shallow pond thawed relatively quickly, but

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Fig. 6a. The main study pond on 20 June, partly thawed; the thermograph and battery pack can be seen across it.

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Fig. 6b. The same pond on 19 July, fully thawed.

after the thaw the substrate a few centimetres below the surface, adjacent to permafrost, was much colder than the topmost layers. Chironomid larvae could develop rapidly only in the most superficial zone. The first adults emerged from this pond less than two weeks after the thaw, although the largest species took longer to complete development, beginning emergence just before we left in the third week of July.

Once most of the snow had melted, the rate of run-off diminished and it became feasible to ford the river (Fig. 7). The place to do this had to be chosen carefully, because the current was still very strong. Fast rivers are hazardous even at surprisingly shallow depths, especially when substrates are unstable or slippery, and the detailed features of this channel were not yet known to us. Moreover, a river passable on one day might be very difficult to cross less than a day later, just like the softening snow in creek beds noted above. As the saying goes: "you never step into the same river twice", because so many variables are in play.

After crossing the river we explored creeks and other habitats that were previously inaccessible. We had wandered well away from camp to collect in these new areas when a large, white animal suddenly appeared in the distance, and then moved steadily closer. We stopped collecting and, pursued by the animal, hurried back to the safety of camp, crossing the river at the maximum speed that might be considered safe. We rushed up to the top of the ridge and deployed the telescope. As the pale fur of its underside caught the light, we saw that it was not a polar bear but a caribou. These animals are curious, and will approach to see what is going on.

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Fig. 7. A reach of the Goodsir river after the peak flow had subsided (10 July).

It would soon be time to leave the research station. Some additional photographs were taken (e.g., Fig. 8), and I donated the necktie I had worn in the Arctic (for warmth and out of habit) to decorate the shielding around the camp sanitary facility! Our transport landed on the camp ridge without incident, and took off again with us aboard. The flight to Resolute was likewise uneventful, although the land we flew over was strikingly barren and rocky (especially compared to the "arctic oasis" of Polar Bear Pass), rather than merely white with snow as it had been on the journey to camp six weeks previously.

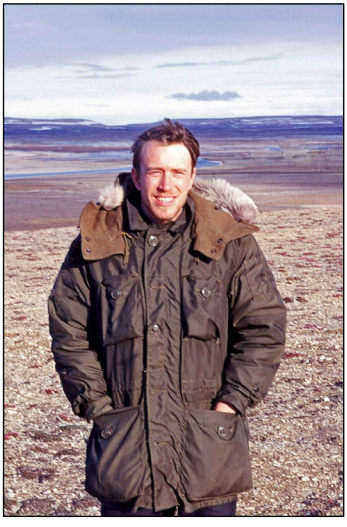

Fig. 8. Author Hugh Danks on Bathurst Island in July 1969.

The rest of our journey home would not be so smooth. Fog set in as soon as we arrived in Resolute, and the aircraft that would carry us back south could not land. These conditions confirmed the relatively sunless climate of the region, responsible for the particular impoverishment of the insect fauna there.

The cloud and fog persisted. I started to worry about the state of my frozen samples in the cooler, despite the relatively low temperatures and the dry ice that had been added in Resolute. It was possible that the weather would clear at any time, but in the end we were held up in Resolute for almost one week. This delay confirmed the lesson that it is not wise to plan strict timelines for research in these regions.

We stayed at the relatively basic (but expensive) accommodation available at Resolute, and soon noticed that ropes had been strung between every hut, even closely adjacent ones. Everyone was required to hold and follow these ropes at all times during conditions with very low—including zero—visibility due to blowing snow. Such blizzard conditions are very dangerous. Without the rope guide, people only a few inches from a hut can get lost and freeze to death.

We took short trips around the airfield, for example to the hill above Char Lake (Fig. 9), and to the boulder shore behind the community. However, we had to stay close by in case an aircraft was able to land. Seeking something else to do, Bob and I decided to get a haircut from the local barber. Apparently, his main role was to trim the hair of members of the Canadian Forces at the Resolute base, a fact that should have alerted us to what would happen when each of us tried in turn to indicate what sort of haircut we would like. I was reminded of Henry Ford's declaration

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Fig. 9. Char Lake at Resolute, and the hill above the lake; the thawed edge of the ice-covered lake can be seen on the near side (21 July).

about the earliest mass-produced cars: “any customer can have a car painted any color that he wants so long as it is black”. In Resolute, a person could have any haircut that he wanted so long as it was so short that it looked like all the others.

Also trying to find something to do was an older German tourist, who spoke virtually no English. He had come in response to somewhat misleading advertisements from the airline that offered these scheduled flights (Nordair, which no longer exists). The promised short visit would allow travellers to experience the land and its people, see polar bears and other wildlife, perhaps admire the northern lights, and take in the spirit of the Arctic. Instead, the tourist was stranded on a small fogged-in patch of land for nearly a full week, with few facilities, and with almost nothing to divert him from his growing frustration. He talked mostly with the only person who could readily communicate with him, the German-speaking wife of one of the scientists who was in transit through Resolute. For the whole time, she bore his increasingly vociferous complaints with admirable grace and fortitude, although the intensity of his grievances was evident even to those who did not speak German!

At last the weather started to clear, and we were asked to be ready for departure at 5 a.m. Several postponements followed, because the aircraft would take off from Baffin Island—beginning a flight of more than 1500 km—only if its chances of landing at Resolute were good. Nevertheless, we were able to depart soon after noon. A long layover in Frobisher Bay (now Iqaluit) followed as the plane made another round trip to Resolute, carrying in supplies while the weather remained suitable, before it continued to Montreal.

Our journey resumed in late evening. Acclimatized to the arctic cold, we were jolted in Montreal by an air temperature above 80°F (26°C) and a relative humidity above 80%, produced by the incursion of an air mass from the Gulf of Mexico. Moreover, the last flight to Ottawa had just left. After an uncomfortable and sleepless night on airport seating, we finally boarded our flight. Even then, because of air-traffic delays, the plane circled Ottawa airport for an additional trying 40 minutes before landing. At long last I reached my apartment and fell into bed, nearly 30 hours after rising soon after 4 a.m. in Resolute to pack. Exhausted from being awake that long, I slept uninterrupted for more than 12 hours, by far the longest sleep of my life.

The following day, I returned to the laboratory to start work, most urgently on the material inside the cooler, which was now in a walk-in freezer. Still frozen solid, the chironomid larvae were used for further studies, including continuing exposures to subfreezing temperatures. Most undamaged larvae recovered on thawing, although some species survived much less well after an additional 12 weeks at −18°C.

Subsequently, the general collections of arthropods brought back from Bathurst Island were identified, through the cooperation of many taxonomists at the Canadian National Collection. These identifications led to a characterization of the local fauna that was summarized in the previous article in this series.