OIL BIOLOGY

In troubled waters

Palmer Station

In January 1989, shortly after the Argentine supply ship *Bahia Paraiso* hit the rocks and spilled 250,000 gallons of diesel fuel into the water near Palmer Station, something happened to all the skua chicks nearby: they died. That much is sure.

But whether it was the effect of fuel oil on the colony that killed the fledgling seabirds, or simply malnutrition, remains the subject of a long-running scientific battle, pitching two graduate students against members of the avian biology establishment. As one of the only examples of a wildlife population that was extensively studied both before and after an oil spill, the case of the skuas is hardly academic. A resolution of the dispute may shed light on the ability of natural populations to recover from unnatural disasters, and suggest priorities in handling the environmental effects of future spills.

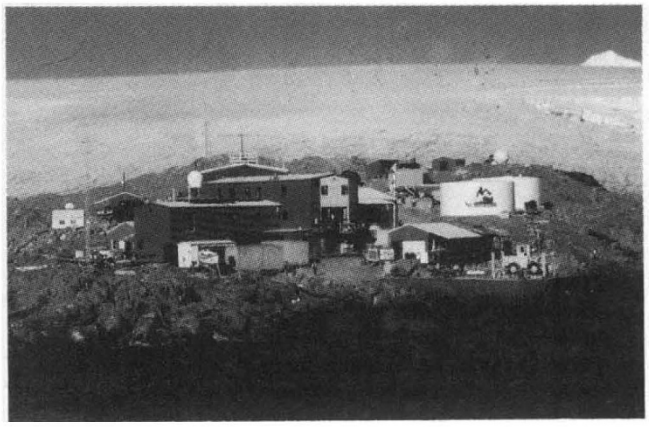
In the upstart corner are Zoe Eppley and Margaret Rubega, who were studying skuas around Palmer at the time of the spill and who are now finishing their graduate degrees at the University of California at Irvine. They argue that the hundreds of skua chicks that perished after the spill were killed by other skuas when their oil-weakened parents neglected the nests.

Opposing them are Wayne Trivelpiece and William Fraser, two long-time avian biologists who are now with the Old Dominion University Polar Oceans Research Group after a long tenure at the Point Reyes Bird Observatory. Trivelpiece and Fraser say that their studies of skua chicks show that the Palmer birds were 'starving' at the time of the spill, and would have died anyway.

The dispute, fought out in the pages of *Nature* (**340**, 513; 1989 & **345**, 211; 1990) and in a *Science* news article last summer, seemed impossible to reconcile. Trivelpiece and Fraser, using data from several skua colonies in the same summer, said that poor nest attendance is not uncommon among skua adults, especially during food shortages of the sort they observed that year. In the *Science* article (**249**, 243; 1990), Trivelpiece was quoted as saying "by 21 days, their birds are 600 grams and ours are 1,100. They're obviously starving."

Faced with such a challenge, Eppley went to the books. She found that previous studies on skua growth showed weights at three weeks of between 470 and about 700 grams for chicks that eventually survived to adulthood. Her chicks had averaged somewhat over 500 grams at that age — on the light side of the spectrum, but probably not starving. "True, they weren't growing like gangbusters, but there are plenty of instances of birds that weighed what my birds did, and went on to survive", she says.

Still, that does not explain how Trivelpiece's birds could have weighed nearly twice as much as the same age. At the request of a reporter, Trivelpiece reexamined his data. He found that the 1,100 gram weight was actually the average weight for 30-day chicks; average 21-day chicks weighed between 750 and 785 grams in his studies — at the other end of the spectrum from Eppley's 500 gram chicks, but no longer unbelievably so. The error had cropped up as a misunderstanding in a telephone interview with the *Science* reporter, he says.



Palmer Station: a contrast to new buildings at McMurdo (page 299).

An argument over the effect of weather on the skuas seems to be going the same way. Fraser believes that a storm, which occurred soon after the oil spill, was responsible for many of the deaths, both at Palmer and at Trivelpiece's colony on King George Island. Eppley has also investigated that possibility. Using meteorological records, she found that storms usually do correlate with the deaths of skua chicks.

But in the 1989 season, records show that the suspect squall struck after the chicks were already dead. "I think Bill is going with his memory on that one", she says.

The bottom line? Trivelpiece still says the Palmer skua chicks were starving and Eppley continues to maintain that they would have lived had not oil forced their parents to neglect the nests. But with the data converging, the argument now appears to be a matter of interpretation, rather than disputed facts. Eppley suggests that the difference in chick weights at Palmer and King George Island, 250 miles away, is likely to be more a function of the varying conditions and bird types at the two sites than an indication of serious malnutrition at Palmer. It is likely that the Palmer skuas were not getting as much food as they should, she agrees. But it was still the oil that pushed the colony over the edge.

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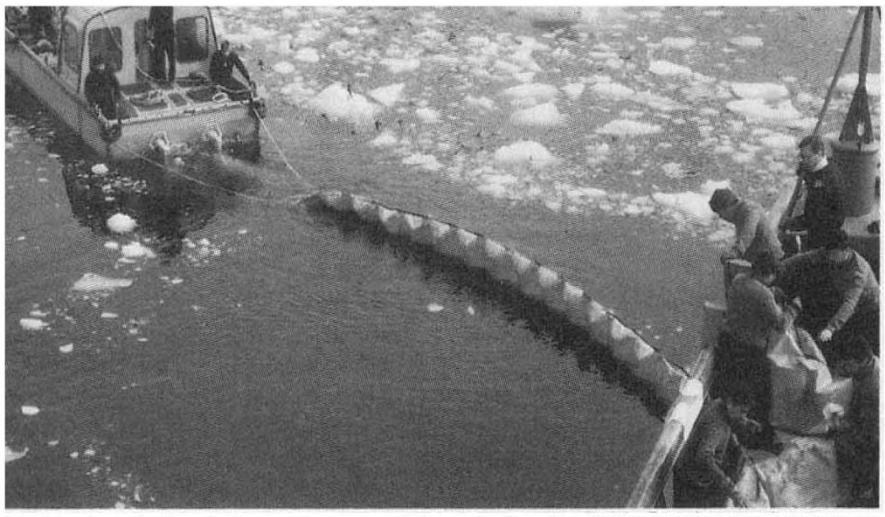

Upside-down in the shallow waters near Palmer Station, the *Bahia Paraiso* can be seen at low tide, a reminder of an ever present environmental threat. The Argentine supply ship, which grounded and capsized in an accident two year ago, still holds some 70,000 gallons of fuel oil. Should the ship break up in a storm, that oil could be released, soaking hundreds of penguins and skuas as it did in 1989.

Debt-ridden Argentina cannot afford to salvage the vessel, but the country has taken the responsibility to do what it can. Last month, the Argentine Navy and Palmer personnel staged the first joint oil-spill drill in Antarctica — a full-speed simulation of the planned response to a severe oil leak at the wreck. Crews from Palmer and an Argentine warship encircled the exposed hull with floating containment booms and practised deploying absorbent materials and a small oil skimmer. US oil-spill experts monitored the operation.

Although NSF had hoped to have the wreck contained within an hour or two, practice showed that an Antarctic spill response is more difficult than similar operations elsewhere. Crews found that even small icebergs tend to drag the booms with them, and much of the time was spent fighting off threatening ice floes with pikes and small Zodiac inflatable boats.