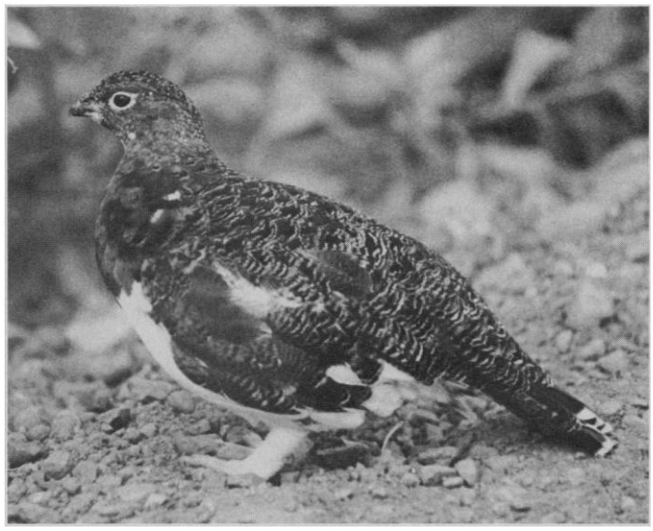
Feathers Fly in Grouse Population Dispute

Researchers have competing theories about what causes the periodic catastrophic declines in red grouse numbers

IN MID-DECEMBER, a covey of ecologists, parasitologists, and ornithologists descended upon Silwood Park, Imperial College's rural outpost near the famous English racecourse of Ascot, for a most unusual meeting. Flushing the researchers from their labs was an acrimonious dispute that has had population biologists all aflutter for several years now. The topic of the twittering: the rise and fall of the red grouse.

Many populations of red grouse fluctuate dramatically from year to year. After soaring, numbers can plummet to the verge of extinction—declines of 97% have been recorded. To explain the periodic declines, two angry breeds of ecologist have taken to—what else?—grousing at each other like competing crowds of ravens.



Len Rue, Jr./ Animals Animals

Bankruptcy protection. *Grouse hunting provides needed income for upland estates.*

Each has decried the other's work. "They don't see what we see, and we don't see what they see," squawks Peter Hudson, the leader of one flock.

The flap is partly theoretical; it deals with issues critical to understanding population control in the wild. But it is of even more practical concern—to landowners and lairds in the uplands of northern England and Scotland. The grouse is often all that stands between their estates and bankruptcy. People will pay 60 to 75 pounds ($95 to $115) to shoot a brace (pair) of red grouse, and such "sporting income" can provide as much as 85% of an estate's revenue.

Now comes perhaps the oddest aspect of this ornithological cockfight. Both camps of researchers—though implacably opposed on scientific grounds—have been working to devise ways to diminish the periodic crashes in red grouse populations. Yes, animal rightists, the grail of this grouse work is to assure enough birds to keep hunters happy and thereby prevent financial catastrophe for estate owners.

And that can prevent ecological catastrophe as well. Landowners, if deprived of their hunting income, may plow the moors and plant them with conifers, producing a much more barren environment. Preserving the grouse—albeit to be shot—preserves the moors and all the other plants and animals that depend on them.

Appealing to their common goal, the British Ecological Society and the Royal Society for the Protection of Birds brought the two disputing bands of researchers together under a common roof—and behind closed doors—in an attempt to reconcile their differences.

Carrying the banner for the traditionalists were long-time grouse watchers Adam Watson and Robert Moss of the Institute of Terrestrial Ecology at Banchory outside Edinburgh in Scotland. They believe that grouse numbers have what Watson calls "an inherent tendency" to go up and down. Birds become more aggressive and defend larger territories when numbers are high, says Watson, and only territory holders survive the winter. That means fewer birds get the chance to breed, thus reducing their numbers. When numbers are low, more birds breed, thus leading to a population increase.

The revisionists were well represented by Hudson, head of the Scottish Grouse Research Programme of the Game Conservancy, a charitable trust that sponsors research, and his colleague Andrew Dobson, an ecologist who is about to migrate to Princeton University. They assert that a parasitic nematode worm (*Trichostrongylus tenuis*) causes the population cycles.

Hudson and Dobson find that on some upland moors every single grouse is infected and a single bird can carry more than 30,000 worms. Microscopically small, the worms burrow deep into the lining of the birds' appendices, causing bleeding and inflammation and almost certainly interfering with the grouse's ability to nourish itself. Worse, as far as population cycles are concerned, infested birds produce far fewer chicks than worm-free birds.

Watson and Moss don't buy the idea that the parasites cause the population declines. They say that they are at best of only secondary importance. As traditionalists, they would solve the problem by improving management of the heather that sustains and protects the grouse. Better heather would not stop the populations from cycling, but it would increase the average number of birds. Unfortunately, the modern management techniques used on the moors are more sensitive to short-term economic considerations than the needs of the grouse, who end up with nothing to eat and nowhere to hide from their predators.

Hudson and Dobson say that improving the heather is pointless because parasites are the problem. They advocate dosing the birds with an anthelminthic to kill the nematodes. Hudson prefers medicating the grit that birds eat to aid their digestion—a process he has patented. However, Dobson thinks it may be wiser to sneak up on adult birds at night and dose them directly, cutting the risk of causing the selection of drug-resistant parasites.

In the end, though, while participants reported that the conclave did not achieve a complete meeting of the minds, it did manage to smooth a lot of feathers. "It was not as contentious as we thought it was going to be," one witness to the face-off told *Science*. "They mapped out areas where there is uncertainty in the data and where experiments need to be done."

Indeed, a rather simple, and elegant, solution to the squabbling seemed to emerge among the participants of the session: a feeling that perhaps parasites are the key on some moors and heather on others. That would leave both flocks their own territories and plenty of food for thought.

■ JEREMY CHERFAS