Conservation biology

Justifiable killing of birds?

Jared M. Diamond

A BITTER debate has been triggered in Australia by the recent death of a leading ornithologist, Julian Ford, after his arrest for alleged illegal collecting of birds. The affair provokes the question of whether scientific collecting of birds is at all justifiable today, when wholesale destruction of habitats for timber and agriculture is already drastically reducing populations.

One answer is that all decisions about conservation, wildlife regulations and creation of new national parks are based on faunal and floral catalogues defined by the information that specimens provide about species and races, their geographical variation and distribution. For instance, collectors in Queensland recently described five new bird species (see figure), several of them very local and endangered, but all so similar morphologically to widespread related species that they would never have been established as separate species without comparisons of series of specimens. Only when these species had been recognized could conservation measures for their protection be initiated.

The other answer is that specimens are essential for understanding many basic questions of biology. No one denies that collecting can be misdirected or that it should be regulated. But much of our biological knowledge still rests on evidence from specimens, particularly of birds, which have contributed uniquely to our understanding of evolution. It is no accident that Galapagos finches were central to Darwin's grasp of evolution, and that only when his specimens had been brought to England did he realize that the finches comprised many species whose origin required explanation. Those specimens that Darwin shot continue to be important to modern biologists (Lack, D. *Darwin's Finches,* Cambridge Univ. Press; 1947; and Grant, P.R. *Ecology and Evolution of Darwin's Finches,* Princeton Univ. Press; 1986).

It is often assumed that Darwin solved the main problems of evolutionary biology, and that collection of more specimens is unnecessary. But evolution is full of unsolved questions. What role do peripheral isolates play in speciation? Does selection against hybrids sharpen reproductive isolation? Do ecological niche differences appear before or after reproductive isolation? Adequate series of bird specimens from carefully chosen localities provide material for addressing these questions. Australian birds are particularly important because past cycles of rainfall in that country caused populations to expand and contract and hence become isolated, re-encounter each other and hybridize or diverge. Julian Ford excelled at identifying critical isolates and hybrids, and at combining statistical analyses of bird morphology with field observations of bird behaviour. He wrote classic papers on the evolution of quail-thrushes and other bird groups, and on the origin of Australia's distinctive desert and mangrove avifaunas (*Emu* **74**, 161–186, 1974; **82**, 12–23, 1982; **83**, 152–172, 1983; and **86**, 87–110, 1986).

Female Eclectus *parrot, confined in Australia to Queensland's rain forests. The emerald-green male looks so different from the female that they were thought to be of different species.*

To place Ford's death in perspective, consider the following facts. On the one hand, he was charged with collecting 600 bird specimens, but on the other, a square mile of rain forest supports around 10,000 birds, most of them belonging to species that cannot survive outside rain forest and are doomed if their habitat is destroyed. Yet governments that stringently police collecting not only fail to stop the felling of trees, but grant logging concessions on enormous tracts of land, thereby trading short-term economic gain for long-term loss, as the areas of rain forest throughout the world are shrinking rapidly. Why such zeal to prevent a few birds from being collected for science, while killing millions of birds without contributing to knowledge?

There are four reasons why, throughout the world, governments indifferent to conservation like to be tough on scientific collecting: first, it takes thought to realize that habitat destruction kills birds as surely as do guns; second, ornithologists are few, impoverished and politically impotent compared with large industries; third, the reasons for scientific collecting make duller newspaper reading than do the arguments of animal-rights lobbies; and finally, harassing scientists offers a cheap way to feign concern for conservation. If authorities really want their conservationist zeal to be efficacious, they could begin by protecting their natural habitats. □

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Supernova 1987A

Hard X-rays imply more to come

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THE recent detection of hard X-radiation from the supernova 1987A, reported and discussed by several groups in *Nature* on 19 November[1–5], raises expectations that γ-ray lines from radioactive ^{56}Co may soon be detected. Low-energy (soft) X-rays have been detected from other supernovae (although not[3] from SN1987A), but hard X-rays and γ-rays from supernovae have never been observed. Astrophysicists have hoped that they will be seen, so that the details will help explain the origin of the elements.

Hoyle initiated the theory of nucleosynthesis in stars in the decade following the Second World War. It was a correction during 1967–68 of an important detail of his initiating paper[6], on the origin of the iron abundance peak (the equilibrium or e-process), that led to the conviction that the numerous ^{56,57}Fe nuclei were ejected explosively from stars as ^{56,57}Ni radioactive progenitors rather than as the stable daughters[7,8]. The following year we realized[9] that γ-rays emitted during the radioactive sequence $^{56}\text{Ni}\rightarrow{}^{56}\text{Co}\rightarrow{}^{56}\text{Fe}$ should be detectable. But those of us involved held faint hope of an appropriate supernova in our lifetimes, which makes SN1987A seem a little like Christmas.

The first two positive detections of X-rays emerging from the expanding gases were reported in *Nature* on 19 November by international collaborations using two new space astronomy facilities: the Soviet space station Mir and the Japanese X-ray astronomy satellite Ginga[2]. Ginga, consisting of a set of proportional counters with an effective area of 400 cm^2 and a field of view of 2° × 4°, made its first detections in early July[2]. The measurements are of importance in that they document the steady growth of the X-ray luminosity in the 10–30-keV band during the summer,