agent causing the extinction of a species (albeit that the original decline was due to other causes).

What do these reports tell us about the impact of disease on endangered and threatened species? Because the nature of the amphibian epidemics are consistent with the introduction of a pathogen into a naive population, the findings suggest that a new pathogen introduced to a previously unexposed and fragmented population (factors augmented by a shrinking habitat) can lead to decimation from which the species cannot recover. Perhaps the lesson to be learnt here is that in the modern world, with the movement of humans into once pristine habitats and the introduction of alien parasites (a form of 'pathogen pollution'), local outbreaks of disease can become epidemic or even pandemic (Halliday, 1998), leading to local or perhaps global extinction.

Both papers provide evidence to suggest that tipping the balance in the parasite–host dynamic equilibrium can have serious consequences for wild and captive populations. In the case of amphibians, we have evidence for multi-species mortality forming part of a network of global population declines possibly threatening a class of animals. However, perhaps the most important message comes from the *Partula* study – that in this altered world, there may be no limit to a parasite's impact on the population of a host species. The precedent has now been set: extinction by infection.

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Extinction by assumption; or, the Romeo Error on Cebu

One of the most challenging of all species conservation projects is currently being taken on by FFI on the Philippine island of Cebu: the target is a tiny remnant patch of forest (3 sq km) called Tabunan, the only currently known locality for the Cebu or four-coloured flower-

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pecker *Dicaeum quadricolor* and several other forms endemic to the island. There turns out to be an extraordinary history to this circumstance which is worth recounting for the way it illustrates an unsuspected danger inherent in the uncritical acceptance of pronouncements and assumptions of extinction.

Cebu has long been notorious for its deforestation, at least among ornithologists. Over a century ago it was noted that 'the small amount of forest remaining on the island is rapidly being cleared away' (Bourns and Worcester, 1894), and a decade later almost exactly the same comment was made: 'the little forest remaining along streams and on steep hillsides is rapidly disappearing' (McGregor 1907). So it was that, when Rabor (1959) began his collecting and survey work on the island in 1947, even with the aid of aerial survey he was 'unable to find any patches of original forest, and the best place we found was the newly developed forest near Buhisan Dam'.

Rabor's testimony, with its ominous title, was a turning point. Being a Cebuano himself, he may well have sensed the devastation of his native island long before he began professional surveys of it. At any rate he cited McGregor's problems in finding forest back in 1906, failed to find any native growth himself and, unsurprisingly therefore, failed to find more than one of the 10 bird taxa – two species and eight subspecies – endemic to the island. Although he admitted that 'some might persist in second growth we did not find', he used the past tense in his accounts of these nine missing endemic taxa, and the clear impression his paper gives is that these forms were by then effectively, if not actually, extinct. Unfortunately – and by a process that cannot be blamed on Rabor, who was recently and justly described as 'the father of Philippine conservation' (Kennedy and Miranda, 1998) – this impression was converted into a pronouncement from which some of the birds in question appear to have enjoyed no reprieve.

In 1959 Rabor was several years into a fruitful collaboration with S. D. Ripley, which resulted in many significant papers on Philippine birds between 1955 and 1968. In 1958 Ripley had become President of the International Council for Bird Preservation, and in 1962 the Council's *Eighth Bulletin* (with Ripley a member of the editorial board) reproduced Rabor's Cebu paper in full. Presumably Ripley regarded this item by a colleague as too relevant to ICBP to let pass; and assuredly this second round of publicity proved decisive. By turns Vincent (1966–71), Gonzales and Alcala (1969), King (1978–79) and Dickinson *et al.* (1991) all included Rabor's nine missing forms in their preambular lists of extinct taxa, and influential writers like Diamond (1984) and Wilson (1992) picked up on the 'Cebu story' to illuminate their own perspectives on the global conservation crisis. In retrospect it is apparent that after *c.* 1960 Cebu was effectively written off the biological map, with no ornithological interest other than shorebird counts and P. M. Magsalay's work on Rabor's one known forest survivor, the black shama *Copsychus cebuensis*. The seeming irretrievability of the situation was, I suspect, enhanced by the way that the year of last sighting placed beside the presumed extinct taxa in Vincent and King's lists easily transmutes in a reader's mind into date of extinction; and for the Cebu taxa, apart from a single 1892, the date is 1906 – far away and long ago.

Credit for the rediscovery of the Cebu flowerpecker, and therefore indirectly for that of certain other 'extinct' endemic taxa of the island, belongs to a visiting birdwatcher and biologist, R. J. Timmins, who in 1992 scoured the centre of the island in search of any sort of forest. From a high point near Mt Manung-gal he descried the tiny patch now known as 'Tabunan', made his way down to it, and there encountered cover in which, to date, four of Rabor's nine missing taxa have been found to survive (see Timmins, 1992; Dutson *et al.*, 1993; Magsalay, 1993; Brooks *et al.*, 1995; Magsalay *et al.*, 1995).

The fact that prognostications of extinction proved to be wrong in this case is not a particularly unusual circumstance. The first of three real twists to this story is the recent discovery by FFI project staff that, because of its forests, Tabunan was the main base of the Cebu resistance in World War II, and was subsequently celebrated in a locally published book

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The crash site of President Magsaysay's plane above Tabunan in 1957, 2 years before the island of Cebu was pronounced devoid of native forest. Note the forest also covering hilltops in the background. Photograph reproduced by courtesy of the Ramon Magsaysay Awards Foundation, through the kind help of Ms Angelina de la Torre.

(S. Pendry, pers. comm. 1998). I have been unable to uncover more than this, but the consideration in any case is merely that one might have expected the existence of Tabunan to be common knowledge among Cebuanos in the post-war era. It is clearly a pity that Rabor did not know and was presumably never told the story when he began his surveys in 1947.

The second and rather more startling twist lies in the fact that Mt Manung-gal is the site of the aircrash that killed President Ramon Magsaysay, a well-loved Philippine leader, in March 1957. When I visited Tabunan in 1996 to help promote its conservation, I was told that Magsaysay's plane had struck the ridge immediately opposite and above the forest, and that rescuers had experienced extreme difficulty in getting to the site. Nobody seemed to be sure what had caused this difficulty, but one guide thought that the main problem had been dense forest.

A check of contemporary sources by colleagues at the Haribon Foundation shows that this was indeed so. The day after the crash, the *Manila Chronicle* (18 March 1957) reported that 'residents of Mt Manung-gal said it was not possible to determine if there were any other survivors because of the thickness of the forest in the area', and the Mayor of Cebu City, Sergio Osmeña, was quoted as saying the forest there was so dense 'you can hardly see 10 ft away'. The following day the same paper reported the thwarting of a paramedic airdrop by 'reduced visibility, the thick jungle and tricky winds'. A year later, Bernad (1958) visited the site and remarked: 'At one time this entire mountain range must have been thick forest. Now the mountain sides are all denuded and either cogon land or planted to corn. The undulating ridges however are still densely forested. The Mt Pinatubo crashed upon one of these ridges ...' More tellingly, Bernad (1958: 70-71) published a photograph of 'the eastern end' of Manung-gal, which, from the map he provided, appears to line up on the area where the Tabunan patch is found today: several fairly extensive swathes of closed-canopy forest stretch across the middle and further distance. Unfortunately, this photograph cannot be reproduced here, but another, taken from the air and depicting the crash site itself a short time after the disaster, gives at least an impression of the extent of forest that might then have been present.

The extraordinary thing about all this is simply that Rabor, a distinguished university professor writing a paper probably little over a year (it was published in January 1959) after the death of his country's president, appears somehow totally to have missed the details of the disaster. Equally bizarre is that during his aerial surveys in search of forest – assuming of course that at least one of them took place after March 1957 – his own pilot was not sufficiently mindful of those details to mention them. Moreover, in 1957 the Manila Observatory had produced maps of forest cover on Cebu, showing two small but by no

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means insignificant areas in the middle of the island, one of them exactly covering the area where Tabunan survives today (P. Walpole verbally to J. C. Lowen, 1997). How so energetic and dedicated a researcher as Rabor happened to pass all this information by is, today, anyone's guess, although his presence at Yale for part of the period 1957–58 may well have contributed; but in any case his pronouncement of Cebu's total deforestation had the effect of unwittingly shutting a cat in a shed – the 1957 and 1958 photographs strongly suggest that the amount of forest then present at Tabunan might easily have supported all 10 endemic taxa.

The third twist in the story, and the greatest irony of all, is the fact that Tabunan lies in the middle of a protected area called the Central Cebu National Park, established as long ago as 1936 and originally intended to protect an area of forest some 140 sq km in extent, although at the time of gazetting this was reduced to 110 sq km (E. Arregadas and A. Mapalo, pers. comm. 1996). Unfortunately, this appears always only to have been a paper park, and the local branch of the Department of the Environment seems never to have been allowed a budget to post a single guard to protect it. It is still rather mystifying that Rabor should not even have mentioned it, but he clearly had no inkling of any forest there (otherwise, scourge as he was of any conservation backsliding, how little would he have spared his pen!); possibly the gazettement was so much a paper transaction that only a handful of civil servants ever knew it existed. On the other hand, Rabor was convinced that World War II had taken such a heavy toll of Cebu's timber that no native stands remained, so he may have assumed that this applied within the national park too (although of course today the first thing biological surveyors tend to do is identify a region's protected areas and start there). At any rate, the plane crash was apparently the spur to some local rescuers to clear land more intensively, in the genuine or self-excusing belief that this was the wish of the authorities (E. Arregadas and A. Mapalo, pers. comm. 1996): indeed for a time the site became a place of pilgrimage for the president's mourners, and 10–20-year-old documents held at the World Conservation Monitoring Centre indicate that the park's post-1957 tourist function remained the principal one it served. Certainly by the time Timmins made his momentous discovery the place was all but a wasteland. I know of no comparable case where a national park has experienced such utter erasure with such utter public and official obliviousness.

One might have hoped that the preservation of the remnant forest at Tabunan, now its existence and exceptional biological value have been established and publicised, would entail no more than the final (after 52 years) enforcement of park regulations, and elicit the first proper government investment in the conservation of the site. However, settlers' rights are very strong in the Philippines and, as in some other parts of the world, title commonly falls to those who first clear the land of trees. By 1997, despite 5 years of effort by P. M. Magsalay to encourage local recognition of the value of the area, there were four families settled inside the forest and around 20 on its fringes, posing an immediate threat to the site and a major logistical and financial challenge concerning alternative arrangements (S. Pendry, in litt. 1998).

Over the past few decades there have been enough rediscoveries to warn us against overhasty assumptions of extinction (which may, I suspect, sometimes derive from simplification of the CITES (Convention on International Trade in Endangered Species) criterion of 50 years without a record). However, it seems fairly doubtful in this instance whether more than one or two of Cebu's six still missing avian taxa can have any better future than to serve as warnings of how such assumptions can become self-fulfilling. This is all the more disturbing for Cebu being an Endemic Bird Area (Stattersfield *et al.*, 1998): one of the theories behind the EBA concept is that endemism in birds predicts endemism in other life-forms, and if indeed future study reveals that Tabunan harbours such creatures (a lump of mud off the boot I wore on my visit proved to contain an as-yet undescribed dictyostelid slime-mould), there will always be questions

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about what other forms may have become extinct on the island, especially in the fateful period since the late 1950s.

Phrases such as 'living dead', 'basket cases' and 'committed to extinction' are rather frequently used to describe the plight of species in what are perceived to be irremediable circumstances. My hope is that FFI, in taking up the challenge of Tabunan in the face of desperate odds, will prove such phrases to be more colourful than true. At any rate, I prefer Soulé's (1987) view of things – 'there are no hopeless cases, only people without hope and expensive cases' – and while it is too soon to reckon how expensive the saving of Tabunan may be, it is particularly encouraging that FFI has already won Darwin Initiative support from the UK government for plans to manage and reforest the area (although, as FFI is aware, it still remains to be proved that Tabunan is the only patch of native forest left on the island). Perhaps the only real kind of 'living dead' and 'commitment to extinction' in this world are the products of those accidents when we declare species extinct too soon, sealing them off from further investigation and only realising our mistake when evidence like Bernad's emerges from some unexpected quarter.

I have commented before that the new IUCN criteria require rather black-and-white judgements about extinct species, and have preferred to maintain a list of such forms for which hope of survival may legitimately linger (Collar *et al.*, 1994: 210). A protocol is currently being developed to ensure that more than one authority 'signs off' on the categorization of species on the IUCN Red List, and it seems to me important that this requirement should be extended to include those forms classified as extinct; indeed, we may even need an 'Apparently Extinct' or 'Provisionally Extinct' category simply in order to prevent any repetitions of the Romeo Error that overtook the avifauna of Cebu in 1959.

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Questioning new conservation approaches

The opinions and arguments developed in the guest Editorial and News and Views of the April issue (**32** [2]) of *Oryx* were interesting and important. Conservation is changing and we have to face new situations. I would like to express some personal comments.

If we are to deal effectively with biodiversity conservation, i.e. keeping the greatest biodiversity possible on Earth, then we need to know 'why' it is necessary. The 'why' question is of great concern, as can be seen from the elephant and whale issue. Sustainable development and sustainable conservation may prove to be different. To link conservation to commercial use is dangerous if it means that only species with a known commercial value have to be protected. It should be looked at from a different perspective. If a species is well protected and population numbers are sufficiently high, then commercial and sustainable uses can be considered. However, the proof of this situation has to come from those wishing to exploit the species, and independent scientists, like those of IUCN/SSC specialist groups or any other independent organization, should evaluate any proposition. The exploitation of some species will be ethically difficult or questionable (apes are a good example, but by no means the only one).

The situation of the North Atlantic cod *Gadus moruha* is quite relevant in this context. With no real 'save the cod' lobby or non-governmental organization, a no-catch quota in the North-West Atlantic was agreed recently. Nobody can argue that this species is not of real economic importance for human consumption, and that its 'sustainable' use has to continue. But the current level of exploitation is just not sustainable. If we can bring such a species to a level of near economic extinction, then the same can happen to any other species. The idea that any species has to pay (to human kind) for its survival represents a great misunderstanding of biology and of evolution. Every individual of every species already has to work hard for its own survival. The argument that each species has to pay us for its survival makes humans 'racketeers'. This means that we are asking all other species to pay a life-tax. I understand and admit that sustainable use is something quite different.

Why should we try to protect biodiversity? Perhaps we should ask first, is there any reason not to protect it?

Another question is the difficult discussion about traditional uses of endangered species or resources. The danger is that 'traditional' may represent very different situations. How far back in time (1, 10, 100 or more years) must we go in order for the term 'tradition' to be used for any exploitation or claim? Is the hunting of 'traditional' species with modern firearms the same as hunting with traditional weapons? Is it in the spirit of tradition for local produce and traditional ways to be open to the world market through the World Trade Organisation (WTO), when the scales and the rules are so different? Traditional practices used to exploit local resources for global markets, whilst providing short-term profits, run the risk of destroying the resource base. Real traditional use is certainly possible, if also sustainable, but the word 'traditional' needs to be clearly defined.

To the questions 'why' and 'how' to protect species, immediate answers are essential. If not, we may soon lose many species. There may be large, short-term profits for some indi-

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