

Big fish threaten Africa's great lakes

Fisheries experts are warning of impending ecological disaster in East Africa's biggest lake—Lake Victoria—as a result of a development experiment that went wrong 15 years ago.

The introduction of the Nile perch *Lates niloticus* into the lake in 1960 has led to a drastic drop in the numbers and kinds of other fish that live there, according to a report by a team of Netherlands scientists from Leiden University. The results of their 10-year study show that losses include many important fish species of high market value as staple and speciality foods, dozens of rare species much prized as ornamental aquarium fish, and at least one kind that helps control the human killer disease schistosomiasis (bilharzia) by preying on the water snail that carries it.

The Nile perch can grow to a weight of 100 kg or more. The idea that this enormous predator could coexist with species native to the lake has proved tragically faulty. The carp are now cannibalizing their own kind, having reduced populations of most of the lake's 300-plus other species to a fraction of their pre-1970 size. There is no reason to suppose that this trend will ease before most of Lake Victoria's native fish species, many of which are endemic, have been wiped out.

Introducing this huge fish into East Africa's many large inland waters offered promise of a new, high-yielding protein source for the region. A pilot project, backed by—among others—the UN Food and Agriculture Organization (FAO), was set up and stocks of the fish were held ready for introduction in ponds near the northern (Ugandan) end of Lake Victoria in the late 1950s. At the last moment, scientists and local observers voiced serious doubts about the wisdom of the project. They feared that introducing the Nile perch might upset the capacity of the lake to support a varied range of species and that the economic impact could turn out to be counter-productive. But even while the debate continued, some of the fish somehow escaped—or were prematurely released—into the lake. For nearly 10 years their impact seemed hardly worth worrying about. But by the early 1970s more and more astonished fishermen found themselves face to face with Nile perch, bigger than themselves, in the few moments before their nets

broke. As the fish spread to other parts of the lake, thought of a food bonanza faded: large-scale fish are not necessarily good news for small-scale economies.

The Leiden report maintains that the Nile perch is gradually robbing the East African economy of a major dollar-earner in the ornamental fish trade and is generally restricting market diversity—a must for the survival of small-scale economies. The market glut of the new fish, which many local people will not eat, means that a kilogram of Nile perch is now selling for as little as one Kenya shilling (0.3 of US\$1). When other species are available, they fetch 30 shillings per kg.

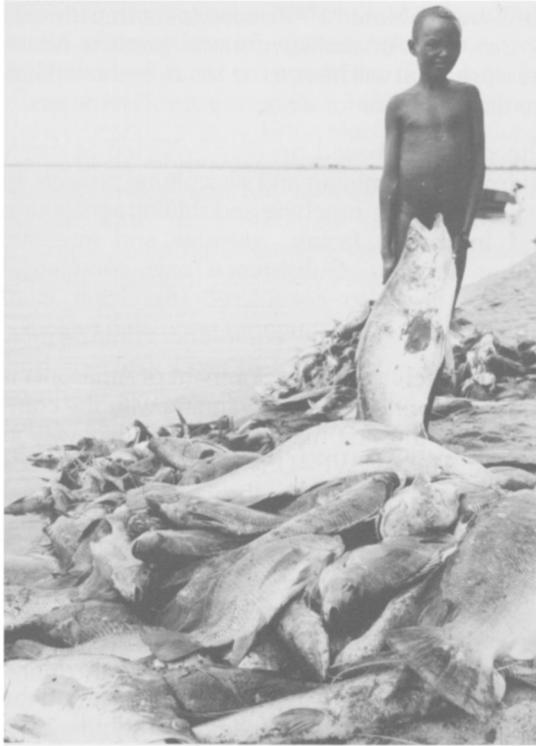
As the fish spread, they are wiping out the prawn population—an essential link in the lake's food-chain. Their impact is not restricted to the aquatic environment. They cannot be processed by sun-drying—the traditional method—because they are too oily. They must be smoked—and fishermen are cutting valuable trees for fuel. The larger fish require heavier, stronger and more expensive nets, resulting in poorer fishermen being driven out of business by wealthier individuals. Fishermen's catches are actually down by two-thirds.

Nevertheless (and incredibly), plans are afoot to repeat the experiment very soon in Lake Malawi and other large lakes in the region. The IUCN is writing to the governments and intergovernmental agencies involved in the proposed new introduction schemes to warn them that more introductions will almost certainly mean more regrets than benefits. The IUCN is also endorsing a plan to transfer specimens of other fish species threatened by the presence of Nile perch in Lake Victoria into large aquaria to preserve their genomes.

The Leiden report calls on the UN Food and Agriculture Organization: 'to concentrate on rational exploitation of the indigenous fish stocks, efficient distribution of catches and the reduction of unnecessary losses during preservation and storage'. The IUCN agrees that these courses of action are far more likely to have fair, productive and sustainable results than further dangerous introductions.

From an IUCN Press Service article by Robert Lamb and Drake McHugh.

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Nile perch—a threat to fish in Africa's big lakes (WWF/John H. Blower).

The thylacine alive—on mainland Australia

Photographs published recently in *New Scientist* (24 April 1986) will have brought joy to those who found it hard to accept that the thylacine *Thylacinus cynocephalus* had gone for ever. The photographs were taken by a tracker of Aboriginal descent, Kevin Cameron, more than a year ago in dense forest in the south-west of Western Australia. They show most of the body of a thylacine—its head is out of sight behind the base of a tree where it was digging. Kevin Cameron also obtained footprint casts and says he has seen at least four separate animals on several occasions, his detailed observations matching those recorded in scientific literature.

There have been sightings of thylacines on the mainland before. Many have been reported in the press and many have been consistent with the known appearance of the thylacine. In 1949 a

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Russian scientist, Dr S.J. Paramonov, saw what he later discovered must have been a thylacine in New South Wales. He published his observations much later, in 1967, prompted by the discovery of a decaying thylacine carcass at Mundrabilla Station, about 110 km west of Eucla in Western Australia. Despite evidence from radiocarbon dating, which put the carcass at 4500 years old, and the widespread belief that the thylacine has been extinct on mainland Australia for thousands of years, Athol Douglas (author of the *New Scientist* article and now retired from his post as Senior Experimental Officer at the Western Australian Museum in Perth) is convinced that the carcass is recent. He is not convinced that carbon dating is completely reliable, especially in limestone caves where soluble carbonates can give a false carbon-14 date, and the condition of the carcass when discovered suggests that it could not have been dead for very long.

Cameron's sighting is the first to be supported by photographic evidence. Government officials refused to accept it for some time, but now their attitude seems to be changing. It could just be that mainland Australia thylacines will get their first reserve.

More hope for the hispid hare

Until quite recently, the hispid hare *Caprolagus hispidus* was considered to be seriously threatened. By 1981 the only certain viable population was in the Manas Wildlife Sanctuary and Tiger Reserve in north-western Assam. In 1984 even this population seemed insecure when the Government of India proposed to build two dams on the Bhutan side of the Manas River, a scheme that would irretrievably damage the Manas Sanctuary.

There was obviously a need to discover whether any other hispid hare populations remained within the species's former range. In 1984 William Oliver of the Jersey Wildlife Preservation Trust conducted a three-year field survey of remaining tall grasslands in north-eastern Bangladesh, south-western Nepal, north-eastern Uttar Pradesh, extreme north-western Bihar and northern West Bengal. Despite the limited time available to collect evidence, he was able to conclude that relict, but certainly important,

populations of hispid hare survive in at least four separate areas of the Terai region of south-western Nepal and north-eastern Uttar Pradesh, and in two separate areas in the Bengal Duars. From west to east these are: Royal Sukla Phanta Wildlife Reserve, Dudwa National Park, Royal Bardia Wildlife Reserve, Royal Chitwan National Park, Jaldapara Wildlife Sanctuary and Buxa Tiger Reserve. The population in Buxa seems unlikely to survive in the long term because the limited amount of suitable habitat is heavily overgrazed by domestic stock. In the other areas the hare seems well established despite the relatively limited extent of tall grassland and the seasonal burning and/or harvesting of thatch grasses and canes.

The depletion of grassland habitat due to the demand for new settlement and agricultural land is undoubtedly the most important factor contributing to the overall decline of the species, and it has been exacerbated by human-induced changes in seasonal flooding, which have favoured the later stages of vegetation succession.

The survey results are encouraging, Oliver concludes. We are no longer faced with the situation in which the ultimate survival prospects of the hare depend solely on the future of Manas, although that site undoubtedly remains one of the most important. The future is not assured for the hispid hare; although the Indian Government has now decided not to build the dam that would affect Manas, the grasslands where the hare lives are generally poorly managed. However, the future does look less gloomy for the hare.

Reference

- Oliver, W.L.R. 1984. The distribution and status of the hispid hare *Caprolagus hispidus*: the summarised findings of the 1984 pigmy hog/hispid hare field survey in northern Bangladesh, southern Nepal and northern India. Dodo, *J. Jersey Wildlife Preservation Trust*, **21**, 6–32.

What future for Amazonian wildlife?

by Andrew Johns

During 1984 and 1985 the World Wildlife Fund (US) conducted detailed studies of the trends of economic development within Brazilian Amazonia, and the potential and actual effects on the region's wildlife. A comprehensive report

published in March 1986 identifies current threats to the vast Amazonian forests, predicts future pressures that will have to be faced, and considers the directions for future conservation strategies.

The report is based on data collected at major hydroelectric, mining and silvicultural projects, in regions of cattle-ranching and shifting agriculture, and in forests facing extensive and intensive timber logging. Subsistence and commercial hunting are also considered: the latter is of growing concern throughout populated regions.

Intensive economic development of Amazonia is a recent phenomenon, beginning with the completion of the first main Amazonian highway in 1960. The WWF-US studies took place approximately halfway through the projected development period: in another 25 years little rain forest will remain. At present, agricultural and industrial development are concentrated in the eastern and southern regions, the areas best served by highways and closest to the markets and export points of southern Brazil. Major mineral deposits are found in the region, and the hydroelectric potential of the major tributaries of the Amazon is already being harnessed. In the northern and western regions, at least until the completion of perimetral highways, the main threat is that of timber logging. Amazonian timbers, with a few exceptions, are not valued highly on the international market, but this is changing rapidly with the depletion of more traditional source areas. By the year 2000 Brazilian Amazonia is expected to produce 10 per cent of the world's hardwood, more than any other country. Exploration of the pulp potential of seasonally flooded forests (a series of unique vegetation types along the Amazon and its main tributaries) has provided foresters with encouraging results, and these readily accessible forests will be among the first to disappear, along with their endemic species. There exists within Brazil, particularly in the over-populated north-eastern states, a vast pool of labour to assist development plans and to penetrate and colonize the region.

Huge areas of forest still remain in western Amazonia, and the only species considered endangered are those that are commercially exploited: giant Amazon river turtles *Podocnemis*

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expansa, manatees *Trichechus inunguis*, giant otters *Pteronura brasiliensis*, and the giant freshwater fish *Arapaima gigas*. The fact that these are all aquatic species reflects the current concentration of population along the waterways. In eastern Amazonia, loss of forest habitat is already critical and any species endemic to the region can be considered endangered (for example, southern bearded sakis *Chiropotes s. satanas*, golden parakeets *Aratinga guarouba*, and hyacinth macaws *Anodorhynchus hyacinthinus*, one of the world's most impressive bird species). Loss of forest in the eastern and southern regions is leading to the invasion of former rain-forest areas by species of animals and plants more typical of Brazil's dry savannah (*cerrado*) regions.

A great deal of conservation attention currently focuses, rightly, on Brazil's north-eastern and Atlantic forests, already reduced to isolated, largely non-viable fragments. It is not yet too late to act to prevent the same problems arising in Amazonia, at least in western regions. However, a huge commitment of funds and manpower would be required, which, unfortunately, is impossible due to the pressures on Brazil arising from foreign debt repayments.

Effects of Habitat Disturbance on Rainforest Wildlife in Brazilian Amazonia, a report to the WWF-US, is available from the compiler, Andrew Johns, Sub-department of Veterinary Anatomy, University of Cambridge, Tennis Court Road, Cambridge CB2 1QS, UK, for £6 or US\$10, including surface mail.

The white stork: there is hope yet

The International Stork Symposium, jointly organized by Vogelpark Walsrode and the International Council for Bird Preservation, was held in Walsrode in Germany in October 1985 to commemorate the 50th year (1984) of the International White Stork Censuses throughout Europe and parts of Africa.

The white stork population of western Europe has suffered serious and extensive declines within the last decades. Storks have disappeared from Sweden, and only 14 pairs remain in Denmark. Five nests are reported from the Netherlands and 19 from France. Of 2499 pairs in West Germany

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White stork at nest in Yugoslavia (John A. Burton).

in 1958, only 649 pairs raised young in 1984, and in Switzerland 109 pairs exist only as a result of a reintroduction effort following their disappearance in 1950. East Germany has 2700 breeding pairs, but even this is a 41 per cent reduction from the 1934 population. Declines have also been reported from Spain, Portugal, Bulgaria, Rumania, Turkey, Yugoslavia and Greece.

Storks appear to be thriving still in Poland (30,000 pairs), three territories of the Soviet Union (Estonia, Latvia and 'Old Russia') (10,000 pairs), Hungary and Czechoslovakia, while the Austrian population is stable at about 300 pairs.

The major causes of the stork decline are: a reduction in feeding areas due to changes in farming methods and drainage of wetlands; collision with power lines; pesticide use in breeding and feeding areas; a shift away from traditional architecture with the kind of rooftops and chimneys favoured for nesting; illegal hunting in southern Europe and parts of Africa; and locust control programmes in Africa, which deprive wintering storks of their primary food.

The Symposium made many constructive proposals for tackling these problems, including an ingenious system of tax credits and government payments for farmers who maintain traditional farming practices that benefit storks and other wildlife. This system, which has been developed in the Netherlands and Germany, will be publicized and promoted throughout Europe. The next Stork Symposium is tentatively scheduled for 1989 in Hungary. If the enthusiasm and dedication of the 70 scientists at the 1985 conference pays off, storks could be in a much stronger position by then.

Dog's image needs brushing up

The African hunting dog *Lycaon pictus* is classified as vulnerable by the IUCN and has been wiped out over much of its former range, yet it receives little legal protection and appears to be declining still. As in many other parts of Africa, Zimbabwe's hunting dogs have been systematically destroyed; 3404 were killed in vermin control operations up to 1975 and it was not until 1977 that its status in the country was changed from 'problem animal' to 'vulnerable game'.

Sue Childes, in a recent issue of *Zimbabwe Wildlife* (Childes, 1985), cites a recent report from national parks staff that indicates that the total wild dog population in Zimbabwe is now 300–400 individuals, compared with around 600 in 1976. The most viable populations are in the Hwange and Matetsi areas (150–200) and in the Zambesi Valley (80–100). There is also a small population of about 40 in the Gonarezhou. Outside the national parks the dogs still meet with prejudice and are frequently shot on sight. Yet, if all the dogs outside the parks—about 60—ate only cattle, Sue Childes estimates that they would consume 88–130 a year—not a tremendous loss from a national herd of five million. By contrast, the cheetah, of which there are an estimated 500 in Zimbabwe, also preys on livestock, but, being a 'specially protected species', does not meet the same fate. The fascinating social behaviour of the African hunting dog has been well studied and written about, but it seems that some further public relations work on their behalf is needed if they are to survive.

Reference

Childes, S. 1985. Wild dogs: victims of ignorance. *Zimbabwe Wildlife*, **41**, 13–15.

How many spotted owls can the US afford?

Concern for the future of spotted owls in the US has become increasingly intense as more and more mature Douglas fir and redwood forests in the bird's range—California, Washington and Oregon—are felled. The bird currently numbers about 5000 and its population is declining at an eight per cent annual rate. In 1985 The National Wildlife Federation won an injunction to prohibit

timber sales in one of Oregon's national forests until an environmental impact statement on the effects of continued logging on the owl is complete. The National Audubon Society is naming a task force to review the entire spotted owl issue and the federal Government has provided support for research aimed at understanding the bird's needs. The owls prefer old growth forest because it ameliorates the hot summer temperatures. The owls' dense plumage protects them against the cold winters of the region, but stresses them if exposed to temperatures greater than 85°F. Temperatures in old forest are 10–15° cooler in summer than in the more open forests that result after logging, and where summer temperatures may reach 100°. Old forest is also better in providing food and nesting sites. Each pair of spotted owls needs about 1000 acres of old forest, which at present prices represents \$18 million worth of wood. Wildlife managers at the US Forest Service are trying to decide how much old-growth forest can be cut while still maintaining a healthy owl population.

Expedition to help save Amazon rain forest

The Maracá Rainforest Project, which begins later this year and will continue throughout most of 1987, is the Royal Geographical Society's next major scientific research expedition. Some 40 British and Brazilian scientists will work on Maracá Island, a vast uninhabited riverine island in one of the northernmost headwaters of the Amazon. The team has been invited by the Brazilian Special Secretariat of the Environment, and its research proposals have been welcomed by the Brazilian authorities as being of real practical benefit to their country.

The Project will tackle five research programmes:

(i) *Forest regeneration*. This programme will study the natural cycle of regrowth after different types of destruction or clearing. Once the processes of regeneration are better understood, the precious forests can be helped to establish themselves again.

(ii) *Soils and hydrology*. This programme will study litter dispersal and decomposition, the

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runoff or evaporation of rainfall, and erosion of soils exposed by forest clearing.

(iii) *Medical entomology.* A team of entomologists will study the habitats and breeding cycles of insect vectors in order to eradicate the diseases they transmit. The insects to be studied are: black fly (Simuliidae), which occur in irritating numbers on Maracá Island and which carry onchocerciasis (river blindness) and mansonelliasis; reduviid bugs on small forest mammals, which spread almost-incurable trypanosomiasis (Chagas disease); sandflies, which carry leishmaniasis, a disease that destroys victims' noses and mouths, and Diptera (biting flies), which transmit diseases that debilitate both humans and livestock.

(iv) *Land development.* Millions of settlers are moving to the frontiers of the Amazon forests in a desperate search for land. This programme will study planned and spontaneous settlement around Maracá. With better planning and assessment of land potential, the settlers themselves could be greatly helped and the environmental damage they cause could be lessened.

(v) *Ecological survey and management plan.* Maracá Island is 55 km long and its area is 92,000 hectares (227,000 acres). It is protected and uninhabited, and its ecosystems cover wetlands, savannah and rain forest. The great wealth of flora and fauna includes species that are becoming endangered in other parts of Brazil. Many specialists will be deployed to build up an ecological inventory, and unknown species may be discovered. The Royal Botanic Gardens, Kew, and the Royal Botanic Garden, Edinburgh, will make this Project their main overseas effort for 1987 and are sending a strong team of botanists. Once this inventory has been made, a management plan for the future of this important forest will be prepared.

Rare bird discovered

Jerdon's courser *Rhinoptilus bitorquatus* was rediscovered by a young member of the Bombay Natural History Society near Cuddapah in Andhra Pradesh on 17 January 1986. It was the culmination of intensive fieldwork by the Society, and Dr Salim Ali, renowned ornithologist, described the event as the discovery of the century.

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Jerdon's courser—rediscovered after 86 years (*Bombay Natural History Society/ICBP*).

First described by Dr T.C. Jerdon in 1848, it was last seen in the Pennar Valley in Andhra Pradesh in 1900. It is also known as the double-banded courser because it has two white bands across the lower part of its otherwise brown neck.

Conservation news from Jordan by Marie Matthews

A new reserve bordering the Dead Sea was established in Jordan in November 1985. The Wadi Mujib Wildlife Reserve covers 250 sq km and is important for many bird species as well as ibex *Capra ibex*. The Royal Society for the Conservation of Nature (RSCN) is managing the reserve and has plans to develop hiking trails and camping sites on its fringes near the Zara springs.

At the Shaumari Wildlife Reserve near Azraq, which is also managed by the RSCN, there are now 50 Arabian, or white, oryx *Oryx leucoryx*, 28 of which are females. The most recent birth was recorded on 2 February 1986 and was that of a female calf. The male: female ratio recently changed after several males (including the dominant male) succumbed to wounds sustained during fights between them. All but two of the oryx are free-ranging within the fenced 22-sq-km

reserve. One of the remaining two is too tame to join the main herd, and the other is a female recovering from a fracture of the femur. She will be set free as soon as she gives birth to what should be her sixth calf.

There are also 19 Arabian gazelles at Shaumari: 13 of these roam with the oryx, and six gazelles originally from Oman are kept in a large enclosure. A pair of onagers *Equus hemionus onager* were sent to Jordan in February 1983 from France, but the male died as a result of a snake bite. The RSCN is expecting an additional pair of onagers from France to join the lone female soon. A lone ibex *Capra ibex* is nearing maturity and the RSCN is seeking a mate for him. A pair of ostriches originally from Oklahoma Zoo are now kept in a larger enclosure with lush vegetation after a female died last summer with over 5 kg of gravel in her stomach. The ostriches are nearly three years old and it is hoped that they will start breeding soon.

Between 700 and 3000 people visit Shaumari each month. Access to the reserve itself is restricted, and visitors view the animals from two observation towers. The construction of a new Visitors' Centre started in February and should be completed by the summer. The RSCN intends to use it as an information centre for visitors, to show audiovisual presentations about Jordan's reserves, and to promote education for conservation in the local population.

Acknowledgment

I would like to thank Mr Abu Jafar of the RSCN for his help and hospitality during my stay in Jordan.

Marie Matthews, 21 Rue Saint-Amand, 75015 Paris, France.

Persian fallow deer still survives in Iran

It is heartening to learn that conservation efforts are continuing in Iran for the endangered subspecies of fallow deer *Dama dama mesopotamica*. Once occurring from Asia Minor and Palestine to Iran and probably in northern Africa, the Persian fallow deer, which has sometimes been referred to as a separate species *D. mesopotamica*, was at one time considered extinct. Then, in the 1950s, a small population was found along several rivers in western Iran near the border with Iraq.

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The 1985 census of the deer in the 55-ha Dasht-e-Naz Wildlife Refuge near Sari in northern Iran found 118 deer. In August 10 injured and old deer were culled and information was collected to help improve the management of the herd even further. These numbers are a considerable increase on the 50–55 reported in the June 1979 *Oryx* (page 65). That issue also reported that one male and two females had been flown from Dasht-e-Naz to the 2600-ha Ashk Island in Uroomieh Lake, (formerly Rezaieh Lake) in north-west Iran, and it is encouraging to learn that a population of 20 deer has now been established there. There is a third population in the north—26 individuals originating from Opel Zoo in West Germany—in a 16-ha enclosure at Semeskandeh near Sari.

In the west the deer's habitat was badly affected by the Iran–Iraq war; there are no reliable figures for Dez Wildlife Refuge—the best estimate is 20–30—and Karkheh Wildlife Refuge lost its deer population.

The next step in restoring the deer, according to Dr Mahmoud Karami of the Wildlife Ecology Department of the University of Teheran, is to introduce some deer from the over-stretched Dasht-e-Naz to Karkheh and to find new habitats in the Zagros Mountains in western Iran.

The need for pharmaceutical companies to invest in forest conservation

One of the many arguments put forward to justify the conservation of tropical forests is their potential to provide us with new drugs and medicines. Already, more than 25 per cent of the world's pharmaceutical products are derived from plants, most of them tropical, and, although some are now synthesized industrially, the majority are still extracted from plants. It is thus somewhat surprising that the pharmaceutical industry appears to be taking very little interest either in developing new products from tropical plants or in investing in the conservation of areas of tropical forest, which could act as 'biochemical libraries' for future research. Last year Dr Stephen Elliott and Dr Joseph Brimacombe set out to compile an inventory of the medicinal plants used

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by the people of two 'enclaves' in Gunung Leuser National Park, Sumatra, Indonesia (Elliott and Brimacombe, 1985). Of the 200 pharmaceutical companies they approached for support only six offered funding, and that only constituted a total of £700. Only one company stated that it was involved in a medicinal plants programme.

In the report of their 10-week study, in which they interviewed 21 dukuns (native doctors), they list 171 plants used in medical treatment. The medicinal uses of many of these species had never been recorded before, but others appear to be used for similar purposes throughout South East Asia and have a long history of medicinal use. Some have been analysed chemically, but few have been adequately investigated by pharmaceutical companies.

Elliott and Brimacombe suggest that perhaps one reason for this neglect is that medicinal plants are assumed to belong to the realm of 'alternative medicine' and are not worth taking seriously. The companies could be making a big mistake, for plants are known to synthesize a wide range of compounds that play no part in their normal metabolic processes and that directly affect animal biochemistry. Currently more than 10,000 secondary plant compounds from well over 50 major plant groups have been described. Alkaloids are a particularly valuable group and include strychnine, cocaine, morphine, and a host of others used as pain killers, cardiac and respiratory stimulants, muscle relaxants, local anaesthetics and anti-cancer drugs.

The pharmaceutical industry seems to be pinning its hopes on biotechnology for the production of new drugs. So far this development has been largely confined to the genetic manipulation of micro-organisms to produce hormones and enzymes. The useful alkaloids, however, are products of complex, multi-step biosynthetic pathways, which would be difficult to produce in this way. Surely it makes sense to take a fresh look at plants, particularly in the areas of medicine where modern methods of drug research are failing to produce effective products, for example, for most forms of cancer and for viral diseases.

It is sometimes argued that modern methods of drug design and chemical synthesis are more economical and practical than randomly

searching the plant kingdom for new drugs. However, screening plants is becoming cheaper with new, sophisticated, automated analytical techniques and could be more effective if screening programmes were based on ethnobotanical studies such as the one reported here. The financial rewards are potentially very high; the commercial value of pharmaceutical products owing their origin to plants is currently more than US\$20 billion per year.

It is time, Elliott and Brimacombe conclude, that pharmaceutical companies recognize that they already owe a great deal to tropical plants and that they have much to gain from their conservation. They should accept some of the responsibility for ensuring that tropical forests are not wiped from the face of the earth in the next few decades by co-operating with the conservation organizations that are seeking to protect them.

Reference

Elliott, S. and Brimacombe, J. 1985. *The Medicinal Plants of Gunung Leuser National Park, Indonesia*.

Copies of the report are available from Dr J. Brimacombe, c/o Dr M. Rogers, Zoology Department, Edinburgh University, West Mains Road, Edinburgh EH9 3JT, UK, for £4.00 including postage. Please make cheques payable to Indonesian Expedition 85.



A First Day Cover of these stamps is available for £3 from J. & M. Arlington Ltd, British Wildlife Appeal Offer, 45 Lakenheath, London N14 4RL.