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M E A T

Now, It's Not Personal!

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a problem for everyone on the planet.**

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WORLD

Now, It's Not Personal!

But like it or not, meat-eating is becoming a problem for everyone on the planet.

by the Editors

Ask people where they'd rank meat-eating as an issue of concern to the general public, and most might be surprised to hear you suggest that it's an issue at all. Whether you eat meat or not (or how much) is a private matter, they might say. Maybe it has some implications for your heart, especially if you're overweight. But it's not one of the high-profile public issues you'd expect presidential candidates or senators to be debating—not up there with terrorism, the economy, the war, or “the environment.”

Even if you're one of the few who recognize meat-eating as having significant environmental implications, those implications may seem relatively small. Yes, there have been those reports of tropical forest being cut down to accommodate cattle ranchers, and native grassland being destroyed by grazing. But at least until recently, few environmentalists have suggested that meat-eating belongs on the same scale of importance as the kinds of issues that have energized Amazon Watch, or Conservation International, or Greenpeace.

Yet, as environmental science has advanced, it has become apparent that the human appetite for animal flesh is a driving force behind virtually every major category of environmental damage now threatening the human future—deforestation, erosion, fresh water scarcity, air and water pollution, climate change, biodiversity loss, social injustice, the destabilization of



Jochen Tack/Peter Arnold

communities, and the spread of disease.

How did such a seemingly small matter of individual consumption move so rapidly from the margins of discussion about sustainability to the center? To begin with, per-capita meat consumption has more than doubled in the past half-century, even as global population has continued to increase. As a result, the overall demand for meat has increased five-fold. That, in turn, has put escalating pressure on the availability of water, land, feed, fertilizer, fuel, waste disposal capacity, and most of the other limited resources of the planet.

To provide an overview of just how central a challenge this once marginal issue has become, we decided to survey the relevance of meat-eating to each of the major categories of environmental impact that have conventionally been regarded as critical to the sustainability of civilization. A brief summary observation for each category is accompanied by quotes from a range of prominent observers, some of whom offer suggestions about how this difficult subject—not everyone who likes pork chops or ribs is going to switch to tofu without a fight—can be addressed.

A

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Deforestation

was the first major type of environmental damage caused by the rise of civilization. Large swaths of forest were cleared for agriculture, which included domestication of both edible plants and animals. Farm animals take much more land than crops do to produce a given amount of food energy, but that didn't really matter over the 10 thousand years or so when there was always more land to be found or seized. In 1990, however, the World Hunger Program at Brown University calculated that recent world harvests, if equitably distributed with no diversion of grain to feeding livestock, could provide a vegetarian diet to 6 billion people, whereas a meat-rich diet like that of people in the wealthier nations could support only 2.6 billion. In other words, with a present population *over* 6 billion, that would mean we are already into deficit consumption of land, with the deficit being made up by hauling more fish from the oceans, which are in turn being rapidly fished out. In the near term, the only way to feed all the world's people, if we continue to eat meat at the same rate *or* if the population continues to grow as projected, is to clear more forest. From now on, the question of whether we get our protein from animals or plants has direct implications for how much more of the world's remaining forest we have to raze.

► In Central America, 40 percent of all the rainforests have been cleared or burned down in the last 40 years, mostly for cattle pasture to feed the export market—often for U.S. beef burgers.... Meat is too expensive for the poor in these beef-exporting countries, yet in some cases cattle have ousted highly productive traditional agriculture.

—John Revington in *World Rainforest Report*

► The Center for International Forestry Research reports that rapid growth in the sales of Brazilian beef has led to accelerated destruction of the Amazon



Peter Frischmuth/Peter Arnold

rainforest. "In a nutshell, cattle ranchers are making mincemeat out of Brazil's Amazon rainforests," says the Center's director-general, David Kaimowitz.

—Environmental News Service

Grassland destruction followed, as herds of domesticated animals were expanded and the environments on which wild animals such as bison and antelope had thrived were trampled and replanted with monoculture grass for large-scale cattle grazing. In a review of Richard Manning's 1995 book *Grassland: The History, Biology, Politics, and Promise of the American Prairie*, Pulitzer Prize-winning writer James Risser observes: "Many experience anguish at the wreckage of clear-cut mixed-tree forest, destined to be replaced by a single-species tree farm. Few realize, says Manning, that a waving field of golden wheat is the same thing—a crop monoculture inhabiting what once was a rich and diverse but now 'clear-cut' grassland."

► Grassland covers more land area than any other ecosystem in North America; no other system has suffered such a massive loss of life.

—Richard Manning in *Grassland*

► Another solution [to grassland depletion in Africa] would be a shift from cattle grazing toward game

WATER



Steve Austin/Peter Arnold

ranching. Antelopes, unlike cattle, are adapted to semi-arid lands. They do not need to trek daily to waterholes and so cause less trampling and soil compaction.... Antelope dung comes in the form of small, dry pellets, which retain their nitrogen and efficiently fertilize the soil. Cows, in contrast, produce large, flat, wet droppings, which heat up and quickly lose much of their nitrogen (in the form of ammonia) to the atmosphere.... An experimental game ranch in Kenya has been a great economic success while simultaneously restoring the range.

—Paul R. Ehrlich, Anne H. Ehrlich, and Gretchen C. Daily in *The Stork & The Plow*

Fresh water, like land, seemed inexhaustible for most of the first 10 millennia of civilization. So, it didn't seem to matter how much a cow drank. But a few years ago, water experts calculated that we humans are now taking half the available fresh water on the planet—leaving the other half to be divided among a million or more species. Since we depend on many of those species for our own survival (they provide all the food we eat and oxygen we breathe, among other services), that hogging of water poses a dilemma. If we break it down, species by

species, we find that the heaviest water use is by the animals we raise for meat. One of the easiest ways to reduce demand for water is to reduce the amount of meat we eat.

➤ The standard diet of a person in the United States requires 4,200 gallons of water per day (for animals' drinking water, irrigation of crops, processing, washing, cooking, etc.). A person on a vegan diet requires only 300 gallons a day.


—Richard H. Schwartz
in *Judaism and Vegetarianism*

➤ A report from the International Water Management Institute, noting that 840 million of the world's people remain undernourished, recommends finding ways to produce more food using less water. The report notes that it takes 550 liters of water to produce enough flour for one loaf of bread in developing countries...but up to 7,000 liters of water to produce 100 grams of beef.

—UN Commission on Sustainable Development,
"Water—More Nutrition Per Drop," 2004

➤ Let's say you take a shower every day...and your showers average seven minutes...and the flow rate through your shower head is 2 gallons per minute.... You would use, at that rate, [5,110] gallons of water to shower every day for a year. When you compare that figure, [5,110] gallons of water, to the amount the Water Education Foundation calculates is used in the production of every pound of California beef (2,464 gallons), you realize something extraordinary. In California today, you may save more water by not eating a pound of beef than you would by not showering for six entire months.

—John Robbins in *The Food Revolution:
How Your Diet Can Help Save Your
Life and the World*



Waste disposal, like water supply, seemed to have no practical limitations. There were always new places to dump, and for centuries most of what was dumped either conveniently decomposed or disappeared from sight. Just as you didn't worry about how much water a cow drank, you didn't worry about how much it excreted. But today, the waste from our gargantuan factory farms overwhelms the absorptive capacity of the planet. Rivers carrying livestock waste are dumping so much excess nitrogen into bays and gulfs that large areas of the marine world are dying (see *Environmental Intelligence*, "Ocean Dead Zones Multiplying," p. 10). The easiest way to reduce the amount of excrement flowing down the Mississippi and killing the Gulf of Mexico is to eat less meat, thereby reducing the size of the herds upstream in Iowa or Missouri.

➤ Giant livestock farms, which can house hundreds of thousands of pigs, chickens, or cows, produce vast amounts of waste. In fact, in the United States, these "factory farms" generate more than 130 times the amount of waste that people do.

—Natural Resources Defense Council


➤ According to the U.S. Environmental Protection Agency, livestock waste has polluted more than 27,000 miles of rivers and contaminated groundwater in dozens of states.

—Natural Resources Defense Council

➤ Nutrients in animal waste cause algal blooms, which use up oxygen in the water, contributing to a "dead zone" in the Gulf of Mexico where there's not enough oxygen to support aquatic life. The dead zone stretched over 7,700 square miles during the summer of 1999.

—Natural Resources Defense Council

Energy consumption, until very recently, may have seemed to most of us to be an issue for refrigerators, but not for the meat and milk inside. But as we give more attention to life-cycle analysis of the things we buy, it becomes apparent that the journey that steak made to get to your refrigerator consumed staggering amounts of energy along the



way. We can begin the cycle with growing the grain to feed the cattle, which requires a heavy input of petroleum-based agricultural chemicals. There's the fuel required to transport the cattle to slaughter, and thence to market. Today, much of the world's meat is hauled thousands of miles. And then, after being refrigerated, it has to be cooked.

➤ It takes the equivalent of a gallon of gasoline to produce a pound of grain-fed beef in the United States. Some of the energy was used in the feedlot, or in transportation and cold storage, but most of it went to fertilizing the feed grain used to grow the modern steer or cow.... To provide the yearly average beef consumption of an American family of four requires over 260 gallons of fossil fuel.

—"Meat Equals War," web-site of Earth Save, Humboldt, California

➤ It takes, on average, 28 calories of fossil fuel energy to produce 1 calorie of meat protein for human consumption, [whereas] it takes only 3.3 calories of fossil-fuel energy to produce 1 calorie of protein from grain for human consumption.

—David Pimentel, Cornell University

➤ The transition of world agriculture from food grain to feed grain represents a new form of human evil, with consequences possibly far greater and longer lasting than any past wrongdoing inflicted by men against their fellow human beings. Today, more than 70 percent of the grain produced in the United States is fed to livestock, much of it to cattle.

—Jeremy Rifkin, *Los Angeles Times*, 27 May 2002

➤ [Feeding grain to animals is] highly inefficient, and an absurd use of resources.

—Vaclav Smil, University of Manitoba

Global warming is driven by energy consumption, to the extent that the principal energy sources are carbon-rich fuels that, when burned, emit carbon dioxide or other planet-blanketing gases. As noted above, the production and delivery of meat helps drive up the use of such fuels. But livestock also emit global-warming gases directly, as a by-

MATTER



Jorgen Schytte/Peter Arnold

product of digestion. Cattle send a significant amount of methane, a potent global-warming gas, into the air. The environmental group Earth Save recommends a major reduction in the world's cattle population, which currently numbers about 1.3 billion.

➔ One ton of methane, the chief agricultural greenhouse gas, has the global warming potential of 23 tons of carbon dioxide. A dairy cow produces about 75 kilograms of methane a year, equivalent to over 1.5 [metric] tons of carbon dioxide. The cow, of course, is only doing what comes naturally. But people are inclined to forget, it seems, that farming is an industry. We cleared the land, sowed the pasture, bred the stock, and so on. It's a human business, not a natural one. We're pretty good at it, which is why atmospheric concentrations of methane increased by 150 percent over the past 250 years, while carbon dioxide concentrations increased by 30 percent.

—Pete Hodgson, New Zealand Minister for Energy, Science, and Fisheries

➔ There is a strong link between human diet and methane emissions from livestock.... As beef consumption rises or falls, the number of livestock will, in general, also rise or fall, as will the related

methane emissions. Latin America has the highest regional emissions per capita, due primarily to large cattle populations in the beef-exporting countries (notably Brazil and Argentina).

—United Nations Environment Programme, Unit on Climate Change

➔ Belching, flatulent livestock emit 16 percent of the world's annual production of methane, a powerful greenhouse gas.

—Brian Halweil and Danielle Nierenberg in *State of the World 2004*

➔ Fight Global Warming With Your Knife and Fork

—Article by Elysa Hammond in Sustainablebusiness.com

Food productivity of farmland, as noted above, is gradually falling behind population growth. When Paul Ehrlich warned three decades ago that “hundreds of millions” of people would starve, he turned out to have overstated the case—for now. (Only tens of millions starved.) The green revolution, an infusion of fertilizers and mass-production techniques, increased crop yields and bought us time. That, combined with more complete utilization of arable land through intensified irrigation and fertilization, enabled us to more or less keep pace with population growth for another generation. A little additional gain—but only a little—may come from genetic engineering. Short of stabilizing population (which will take another half-century), only one major option remains: to cut back sharply on meat consumption, because conversion of grazing land to food crops will increase the amount of food produced. (Some argue that grazing can use land that is useless for crops, and in these areas live-

stock may continue to have a role, but large areas of arable land are now given to cattle to roam and ruin.)

▶ Let's say we have 20,000 kcal [kilocalories] of corn. Assume that we feed it to cattle (as we do with about 70 percent of the grain produced in the U.S.).... The cow will produce about 2,000 kcal of usable energy from that 20,000 kcal of corn (assuming 10 percent efficiency; the efficiency is actually somewhat higher than

that, but 10 percent is easy to work with and illustrates the point reasonably). That 2,000 kcal of beef would support one person for a day, assuming a 2,000 kcal per day diet, which is common in the U.S. If instead people ate the 20,000 kcal of corn directly, instead of passing it through the cow, we would be able to support more people for that given unit of land being farmed; not necessarily 10 times more, because people are not as efficient as cattle at using corn energy, but considerably more than the one that could be supported if the corn were passed through the cow first!

[So], we could support more people on Earth for a given area of land farmed if we ate lower on the food chain—if we ate primary producers instead of eating herbivores (corn instead of beef). Or, we could support the same number of people as at present, but with less land degradation because we wouldn't need to have so much land in production....

—Patricia Muir, Oregon State University

▶ While 56 million acres of U.S. land are producing hay for livestock, only 4 million acres are producing vegetables for human consumption.

—U.S. Department of Commerce,
Census of Agriculture



C. Thiriet/Peter Arnold

Communicable disease

doesn't travel from one place to another all by itself; it has to hitchhike—whether in dirty water, the infected blood of rats or insects, or contaminated meat. Globalization has vastly increased the mobility of all of these media, and one consequence is that outbreaks which in past centuries might have been contained within a single village or country until they died out are now quickly spread around the globe. When a case of mad cow disease was detected in the United States in 2004, it was discovered that parts of that single cow had been distributed to about a dozen different states. The problem of containing outbreaks in a system of global distribution is exacerbated by the use of mass-production facilities that rely on antibiotics rather than more costly cleaning of facilities to fend off infection and disease. As antibiotic resistance increases worldwide, the movement of diseases becomes increasingly unimpeded. Some of the most dangerous outbreaks result from the growing illegal trade in bush meat, in which diseases harbored by forest primates, such as HIV—which in the past might have remained sequestered in remote jungles—are now brought into an unregulated global marketplace.

▶ A report by the U.S. Department of Agriculture esti-

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mates that 89 percent of U.S. beef ground into patties contains traces of the deadly *E. coli* strain.

—Reuters News Service

- Animal waste contains disease-causing pathogens, such as *Salmonella*, *E. coli*, *Cryptosporidium*, and fecal coliform, which can be 10 to 100 times more concentrated than in human waste. More than 40 diseases can be transferred to humans through manure.

—Natural Resources Defense Council

- According to the World Health Organization, more than 85 human deaths have resulted from at least 95 cases of ebola reported in the Congo's remote Cuvette-Ouest region. The tip-off to a possible outbreak came when gorillas in the region began dying. Tests of their bodies confirmed the cause of death.... Officials suspect the human outbreak stems from villagers eating infected primates including chimps, monkeys, and gorillas.... When primates are butchered and handled for bushmeat, humans come into contact with contaminated blood. People also get the disease when they eat the infected meat.

—Ebola Outbreak Linked to Bushmeat,
www.janegoodall.net

- It is believed that a sub-species of chimpanzee in

west-central Africa may be the original source of the HIV/AIDS epidemic, and that the transmission of the virus, a simian immunodeficiency virus (SIV), to humans was the result of blood exposures from the handling of chimpanzees killed by hunters.

—Jane Goodall, from a lecture at Harvard Medical School, 2002

Lifestyle disease,

especially heart disease, might not have been regarded as an “environmental” problem a generation ago.

But it's now clear that the vast majority of public health problems are environmental, rather than genetic, in nature. Moreover, most preventable diseases result from complex relationships between humans and the environment, rather than from single causes. Heart disease is linked to obesity resulting both from excessive consumption of sugar and fat (especially meat fat) and from lack of exercise facilitated by car-oriented urban design. The environmental problems of suburban sprawl, air pollution, fossil-fuel consumption, and poor land-use policies are also all factors in heart disease.

- The irony of the food production system is that millions of wealthy consumers in developed countries are dying from diseases of affluence—heart attacks, strokes, diabetes, and cancer—brought on by gorging on fatty grain-fed beef and other meats, while the poor in the Third World are dying of diseases of poverty brought on by being denied access to land to grow food grain for their families.

—Jeremy Rifkin, *Los Angeles Times*

- Who says meat is high in saturated fat? This politically correct nutrition campaign is just another example of the diet dictocrats trying to run our lives.

—Sam Abramson, CEO, Springfield Meats

➔ Meat contributes an extraordinarily significant percentage of the saturated fat in the American diet.

—Marion Nestle, chair of the Department of Nutrition, Food Studies, and Public Health, New York University

➔ Not only is mortality from coronary heart disease lower in vegetarians than in nonvegetarians, but vegetarian diets have also been successful in arresting coronary heart disease. Scientific data suggest positive relationships between a vegetarian diet and reduced risk for...obesity, coronary artery disease, hypertension, diabetes mellitus, and some types of cancer.

—American Dietetic Association

➔ He is a heavy eater of beef. Me thinks it doth harm to his wit.

—William Shakespeare in *Twelfth Night*

➔ The average age (longevity) of a meat eater is 63. I am on the verge of 85 and still work as hard as ever. I have lived quite long enough and am trying to die; but I simply cannot do it. A single beef-steak would finish me; but I cannot bring myself to swallow it. I am oppressed with a dread of living forever. That is the only disadvantage of vegetarianism.

—George Bernard Shaw (1856–1950)

Biodiversity loss and threat of extinction:

Above and beyond the destruction of forests and grasslands for cattle ranching, and the creation of oceanic dead zones by manure-laden runoff, the growing traffic in bush-meat is decimating the remaining populations of gorillas, chimpanzees, and other primates that are being killed for their meat. (A photo we received but declined to print in this issue shows a severed gorilla's head sitting in a food basket next to a bunch of bananas). As the planet becomes more crowded, poor populations are increasingly venturing into wildlife reserves looking for meat—and not always just for their own subsistence. In these areas, it's not enough just to say "eat less meat." Here, the long-term solution will depend on stemming the building of logging roads (which facilitate more rapid invasion by hunters) and stronger

protections against poaching and black-marketeering of bushmeat. It will also require more equitable distribution of the world's limited food output, and of the income with which to buy it.

➔ The real trouble has come in the last 10 years or so, as the big multinational companies, particularly European companies, are opening up the [central African] forest with their roads. Hunters from the towns can use the logging trucks to go along the roads.... They shoot everything from elephants down to gorillas, chimpanzees, bonobos, monkeys, birds—everything. They smoke it, they load it on the trucks and take it into the cities, where it's not to feed starving people—it's where people will pay more for bushmeat than for domesticated meat.... The pygmy hunters who've lived in harmony with the forest world for hundreds of years are now being given guns and ammunition and paid to shoot for the logging camps. And that's absolutely not sustainable."

—Jane Goodall in *Benefits Beyond Boundaries*, a film by Television Trust for the Environment shown on BBC in 2003

➔ The animals have gone, the forest is silent, and when the logging camps finally move, what is left for the indigenous people? Nothing.

—Jane Goodall in *Benefits Beyond Boundaries*

Albert Einstein, who was better known for his physics and math than for his interest in the living world, once said: "Nothing will benefit human health and increase chances of survival of life on Earth as much as the evolution to a vegetarian diet." We don't think he was just talking about nutrition. Notice that in this article we haven't said much at all about the role of meat in nutrition, even though there's a lot more to talk about than heart disease. Nor have we gone into the ethics of vegetarianism, or of animal rights. The purpose of those omissions is not to brush off those concerns, but to point out that on ecological and economic grounds *alone*, meat-eating is now a looming problem for humankind. You don't have to have any conscience at all to know that the age of heavy meat-eating will soon be over as surely as will the age of oil—and that the two declines are linked.

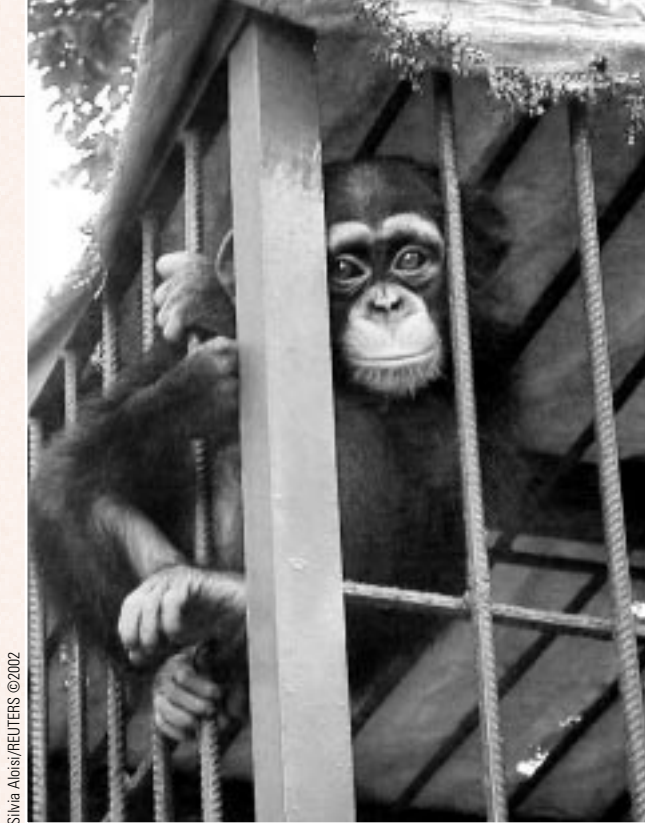
When Primates Become Bushmeat

by Jane Goodall

In 1960 I began to study the chimpanzees of what is now the Gombe National Park in Tanzania (then Tanganyika). During 44 years of uninterrupted study, we have been amazed to find how like us chimpanzees are, biologically and behaviorally. For example, their DNA differs from ours by only 1 percent and they can catch or be infected by all human contagious diseases. The brains of

chimpanzees and humans are anatomically similar, and chimpanzees have intellectual capacities once thought unique to us. They show emotions very similar to those which we call happiness, sadness, fear, or despair. There is a five to six year period when the child is dependent on the mother and when social learning occurs not only through trial and error, but also, as with humans, through observation, imitation, and practice. Strong, enduring emotional bonds develop, and the child may itself die of grief after the death of his or her mother, even when physiologically capable of surviving without her milk. It is sad to find that chimpanzees, who have taught us so much about our place in the animal world, are disappearing in the wild. A century ago, there must have been some 2 million of them in Africa. Today, there are 150,000 at most. The decline is due in part to habitat destruction, as human populations increase and need ever more land for crops, livestock, and settlements.

But the greatest threat is the bushmeat trade—the *commercial* hunting of wild animals for food. For hundreds of years the indigenous people have lived in harmony with their forest world, killing just enough animals to feed their families and villages. Now, things have changed. In the 1980s foreign logging companies moved into the last of the great African rain forests. And even if they practice so-called “sustainable logging,” they open up the forests with roads. It is these roads that are the problem. Hunters ride the logging trucks to the end of a road and shoot everything from elephants and chimpanzees to antelopes, birds



Silvia Albisi/REUTERS ©2002

A baby chimpanzee in a quarantine cage at the Tacugama Chimpanzee Sanctuary (www.tacugama.com) in Sierra Leone, which since 1995 has rescued dozens of animals from the pet trade, bushmeat hunters, and a decade-long civil war. New arrivals are kept in quarantine for several months to avoid spreading any infectious disease they might have caught from humans. The chimps are then released into a 100-acre forest reserve.

and reptiles. The meat is cut up and smoked, then transported to town. There, the urban elite will pay more for bushmeat than for chicken or goat. It is their cultural preference.

The trade is not sustainable. And the situation is made worse because indigenous hunters are paid to shoot meat for the logging camps—for maybe 2,000 people who were not there before.

The Jane Goodall Institute is one of seven NGOs taking part in the Congo Basin Forest Partnership, which with funding from the U.S. Department of State and the European Union, is seeking to curtail the

bushmeat trade. We are working in partnership with other NGOs, government officials, donor agencies, and logging and mining companies. We are trying to educate and involve the local people, making them our partners and helping to improve their lives (as we do in our TACARE program around Gombe).

If the bushmeat trade continues as it has, the great apes could become all but extinct in the Congo Basin within the next 15 years or so. Other animals, too, will become extinct, endangered, or threatened. Eventually, unless we succeed, almost all the wondrous animals of the Congo Basin will be gone. We must not let this happen.

In our work we are helped by the more than 115 orphan chimpanzees in our Tchimpounga Sanctuary. Most of their mothers were shot for food. We encourage the local people, especially school children, to visit the sanctuary. And when these visitors see our chimpanzees embracing, kissing and holding hands, using objects as tools—and when they gaze into their eyes, close up—they realize how human-like these beings are. Many visitors, as they leave, have been heard to say that they shall never again eat a chimpanzee or visit a restaurant that serves chimpanzee meat. These orphans are truly ambassadors for their wild relatives.

We continue to see other reasons for hope, as more and more people around the world begin to understand the danger and want to help. If we lose hope, we lose the battle, for without it we fall into apathy—and the killing and eating will continue until our closest living relatives in the wild are gone.