



INFORMATION REPORT

ANIMAL WELFARE INSTITUTE

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THE WHALERS IN THE ASCENDANCY

Tokyo's International Whaling Commission Meeting

The much heralded reduction in sperm whale quotas achieved this June at the Canberra meeting of the International Whaling Commission (IWC) was reversed in Tokyo in December. With a massive demonstration outside the Japanese Foreign Office where the meeting was held, whalers and their cohorts in the Seamen's Union shouted into bullhorns and waved signs calling for what they termed scientific utilization of whales. The Commissioners rushed with unprecedented haste to vote an increase of killing 5,681 sperm whales in the North Pacific. (They raised the 1978 quota of 763, voted this June, up to 6,444; the 1977 quota was 7,200).

The Chairman of the Commission, Arthur Bollen of Australia, issued a press release at noon after switching from the Technical Committee meeting into full plenary session. Commissioners had only just received a scientific paper criticizing the figures and had had no opportunity to study it.

Some of the commissioners had not even received this paper by the world's leading whale population scientist, Dr. Sidney Holt of the U.N. Food and Agriculture Organization. The paper is reprinted in the column at the right. Dr. Holt flatly states that the figures adopted by the Scientific Committee at its November meeting, preceding the Tokyo IWC meeting, are not credible. His reasons are clearly and scientifically stated and are worth reading in full.

Other scientists found the analysis of Dr. Seijo Ohsumi of the Far Seas Fisheries Research Laboratory so difficult to believe that the Committee decided to pool the figures they had from southern hemisphere sperm whaling with those Dr. Ohsumi presented for the North Pacific. By mingling the incredible figure with an existing figure from a different part of the oceans, they came up with a figure which no scientist advocated on the basis of research; nevertheless, since it issued from the Scientific Committee, and most countries have slowly and painfully come to the conclusion that the Scientific Committee should be supported, most of the commissioners came to Tokyo with instructions to vote for its findings and they did so.

Only France had the courage to vote against the massively increased quota. The United Kingdom abstained. All other nations (Argentina, Australia, Canada, Denmark, Iceland, Japan, Mexico, Netherlands, New Zealand, Norway, South Africa, United States, and the Soviet Union) voted for the increase.

The United States has fought hard over the past four years to end the former practice of IWC Commissioners voting quotas much higher than those advised by the Scientific Committee. Its success in establishing the reputation of this Committee created, for this session at least, an uncontrollable monster.

All of the data on which Dr. Ohsumi's paper was based came from Japanese whaling vessels. The data goes back to periods when there were no international observers aboard the vessels, and even now, the observers are not in a position to attest to the type of data involved. In any case, the raw data was not even submitted to the other members of the Scientific Committee. This is the sort of presentation on which the Committee, and the Commission is asked to operate.

The Russians who kill even more sperm whales than the Japanese simply refuse to supply any but the most limited data. Scientists from non-whaling countries have devoted little time to the analysis of such data as they are able to get their hands on. Thus, although Dr. Ohsumi's paper was not accepted without doubts, questions and arguments within the Scientific Committee, it constituted by far the greatest influence on the outcome of the Committee's meeting at Cronulla, Australia just before the

HEARINGS TO PROTECT ELEPHANTS

"... within the last years the threat to all Africa's elephants has grown even more critical, and there is no parallel for their plight among living creatures... They are magnificent animals. They can communicate with one another, you know, and when one falls to the ground, others come to his assistance and try to pry him with their tusks back to his feet—some say because they know the great weight of his bulk will collapse his lungs if he stays down too long... Elephants are believed to have some conception of death, and possibly even of the reasons they are hunted. They have been known to seize the tusks from a dead member of the family and smash them to pieces. Here in Uganda, during one of the cropping episodes, the ears and feet of the destroyed elephants were stored in a shed to be prepared for sale as handbags and umbrella stands. A group of elephants broke into the shed, removed the objects, and buried them. Scientists involved in the episode are said to feel uncomfortable still about the incident."

The Last Place on Earth, Harold T.P. Hayes, New York, Stein & Day, 1977.

On December 13, 1977, Chairman John Murphy (D., N.Y.) held hearings on H.R. 10083 introduced by Representative Anthony Beilenson (D., Calif.) to prohibit importation of elephant products before the Committee on Merchant Marine and Fisheries.

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SPECIAL MEETING OF THE INTERNATIONAL WHALING COMMISSION TOKYO, DECEMBER 6-7, 1977

Statement by Dr. Sidney J. Holt Observer representing Food and Agriculture Organization

It was with great regret that the Food and Agriculture Organization (FAO) found that, due to unforeseen circumstances, it was not possible for a representative to attend the Special Scientific Committee meeting in Cronulla. This means that my comments must be based on study of the report of the Committee and of the background papers, instead of on an intimate knowledge of, and participation in the Committee's discussions, as is usual. I have however, consulted some of the participants in the meeting and thereby assured myself that there are no fundamental misunderstandings involved in the following remarks. It is important, in such matters, to try "to see the wood for the trees" and this is perhaps more easy than if we had been involved in the very complex and difficult discussions of the meanings of the data and the properties of the assessment models used. In this position one may try to assess the overall credibility of the advice the Committee has now presented to the Commission. I hope my friends in the Scientific Committee will forgive me if I say that the results are not credible.

In recent years the advice of the Committee has on several occasions been that quotas should be drastically revised, usually downward. Such advice has been received with surprise and displeasure by some Commissioners. Such proposals for revision have been based on analyses taking into account more data, or using better analytical models, or both. In the present case the proposed stock classifications are dramatically changed and quotas revised upwards on the basis only of a re-application of the same model, using few new data. This calls for a more than usually close look at the way in which this has come about.

It is not easy to see by inspection how the "Allen model" works. For this reason FAO posed last July—that is, immediately after the decision to call a Special Meeting—a number of

concern the separate effects, on assessments, of changes in the assumptions concerning the efficiencies of recorded whaling effort, and in the assumed pregnancy rates and their dependence on density. It seems that:

a) the reclassifications proposed are virtually entirely due to changes in assumed efficiency factors—including the effect of catcher size, but mainly the effects of ASDIC; and

b) the suggested quotas for females derive essentially from an assumption that pregnancy rate increases by 25% (from 0.20 to 0.25) from one extreme of population density to another. Evidence has been presented concerning the average level of pregnancy rate, but none whatever for the range of density dependence, nor even that the pregnancy rate actually has increased with the decline in numbers of biomass, either of females, or of males plus females. In my opinion the range adopted and even the direction of change, are complete guesses. Thus, if the range were actually 0.210 to 0.235 the quotas would be about halved; if it were 0.19 to 0.29 they would be doubled; and so on. The actual range may well be outside such assumed values. The proposed quotas should be viewed in the light of such very considerable ignorance.

However, the biggest factor in the revised advice is the new position taken by the Committee with respect to the effectiveness of ASDIC, which is in some respects the opposite of what has been written and said in scientific discussions in recent years. It is now said not only that ASDIC is used by the Japanese catchers only in chasing, but also that the main effect of introducing ASDIC has been some reduction in the time spent chasing. Since that time is a rather small fraction of the catchers' day's work, this is held to justify the Committee's adoption of a very low value of the ASDIC efficiency factor as concluded in recent analyses by Japanese scientists. However, it is admitted that many chases were, especially before ASDIC came into general use, unsuccessful, and it has been affirmed on earlier occasions that use of ASDIC greatly increases the likelihood that a chase will result in capture. If this is so the increase in efficiency could be great, and would not be measured as the inverse of chasing time. Unfortunately neither the report nor the background documents are informative on this crucial matter.

Then it is necessary to seek an explanation of why the ASDIC efficiency factor reported by Japanese scientists is low compared with all previously published studies, which range up to 100% and more. A possible explanation is to be found in the detailed account given of the Japanese operational method, in which it is emphasized that catchers attached to one expedition always work cooperatively, throughout the search and hunt. This means that the comparison of catches by ASDIC-fitted boats with those without ASDIC, in the same expedition and during the same season, is spurious as a measure of the efficiency factor. Further varying practices between expeditions from one year to another might account for the extreme variation in the estimates quoted. There is therefore no good reason to accept the low values in preference to the much higher values obtained in earlier critical studies.

There is an interesting consequence of the new theory that ASDIC is not very useful—and it has been said that it could even be a disadvantage—in sperm whale hunting, but that it has been installed at considerable expense primarily because of its value in baleen whaling. If this view were accepted, most assessments for baleen whales would need to be revised, because baleen whaling effort has not been corrected for ASDIC in the assessments on which present classifications and quotas are based. I suggest that such revision will lead at least to enhanced protection for sei whale stocks and to prolongation of the protection of fin whale stocks.

Another point that should be taken into consideration is the decision of the Scientific Committee to retain 1947 as the initial year on which to base classification advice. The catch data presented show that, on the basis of the model adopted, the land-station catches of females from the Western Division for 20 years before 1947 would have been sufficient to hold the number of females down to between 90 and 95% of their initial number. Consideration of this fact would be enough to lead to classification of females as "protected" in the Western Division.

The last point I wish to make refers to the absurdity of continuing to equate one female with one male in calculating the appropriate quotas for sperm whales, ignoring the fact that each male yields two or three times as much oil, meat and meal as one female. Apart from the fact that it has not yet been shown convincingly that there is any sustainable numerical advantage in catching any females, there is clearly no advantage in catching females if account is taken of the great difference in size between the sexes. Among the unanswered questions posed by FAO to those responsible for the models adopted was the question of just how great the calculated marginal advantage, by weight or number is—if there is one—and how much, and in what ways, such a calculation depends on the assumed values

In sum, to an "observer" it does not appear that the advice now presented is more reliable or more likely to be correct than the advice previously offered. The complex calculations that have been made are on the one hand incomplete in that the properties of the model and their dependence on precise parameter estimates and assumptions have not been revealed and, on the other hand, are such that they obscure the facts that the crucial parameters have been guessed rather than estimated, and that the calibration of crude effort data to take into account increasing efficiency is still very far from satisfactory.

Some breakdown of operational features has at last been provided for one part of one of the pelagic fleets, 15 years after the Scientific Committee first asked for such data; but the breakdown available still omits critical information—such as the change in the frequency of successful chase, and the time series of searching time per catcher day's work. Further, the analysis of such information as is given leaves a great deal of room for doubt as to what is actually being estimated, and whether the undoubted increases are yet adequately being taken into account.

Without departing from the principle that management must be based on the best scientific advice, it seems it would be wise for the Commission also to take into account:

- a) the very great uncertainties in the assessment of sperm whales which persist, practically unchanged, despite the best efforts of the Scientific Committee;
- b) the likely direction of biases in the data and in the assessments (including an arbitrary starting year of 1947, long after intensive sperm whaling started);
- c) the fact that assessments are still based on data from only a relatively small part of the sperm-whaling fleet; and that those data are incomplete and have been presented selectively.
- d) the consequences to the baleen whale assessments of the "new theory" concerning the technology of sperm whale hunting.

It would be appreciated if these observations could be included in the documentation of the present meeting.

6 December, 1977

THE WHALERS IN THE ASCENDANCY

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maximum degree possible in the prevailing climate of public opinion. At this session, it betrayed a strange dichotomy with regard to the press. As noted above, the Chairman of the Commission insisted that the Commissioners vote immediately and finally on the greatly increased sperm whale quota for the North Pacific because of the interest of the Japanese press in knowing the outcome.

On the other hand, the secrecy rules with regard to the Scientific Committee were so strict that nothing more than the bare figure of increase leaked out until the morning of the Tokyo meeting of the full Commission when Dr. Holt made copies of his paper available.

On the following day, a statement by the International Union for the Conservation of Nature and Natural Resources (IUCN), the major international body providing expertise on endangered species, was issued by Dr. John Beddington. The IUCN statement appears below.

STATEMENT BY THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE ON THE IWC DECISION ON NORTH PACIFIC SPERM WHALES

The International Union for the Conservation of Nature (IUCN)* is unhappy both about the conclusions reached by the Scientific Committee at their special meeting in Cronulla and by the way they were reached. It is not confident that an adequate assessment of the status of the stocks was made nor that the mathematical model used is valid. It notes that the Scientific Committee stated that the dramatic change in the stock assessment was largely brought about by an adjustment of the effort modifiers and it regrets that no indication of the sensitivity of these results to those statistics was given. This is particularly serious when one of the effort modifiers used, that for ASDIC was calculated from data sufficiently problematic to be derived from operations in both the North Pacific and the Southern Oceans. IUCN further notes the Scientific Committee's request for raw data to be made available prior to the meetings of the committee and feels that this is an absolute prerequisite for adequate assessment. IUCN therefore feels unable to support the commission's decision to endorse the Scientific Committee's recommendations on the quotas for the 1978 North Pacific Sperm whale season. Accordingly, it reserves its right to continue to work for alternative assessment and management procedures to those used by the IWC.

* Dr. John Beddington represented the International Union for the Conservation of Nature at the Scientific Committee Meeting

HEARINGS TO PROTECT ELEPHANTS

(continued from page 1)

The increase in U.S. ivory imports, corresponding with the shocking decimation of the elephants is tabulated below in material submitted by Dr. William Y. Brown, Executive Secretary of the U.S. Endangered Species Scientific Authority.

Major U.S. Ivory Imports Reported by the U.S. Department of Commerce			
Year	\$ Value	Year	\$ Value
1972.....	1,524,093	1975.....	2,778,879
1973.....	1,719,879	1976.....	4,354,031
1974.....	2,083,317	1977 (Jan-Oct) ..	(3,943,964)
		(x 1.2)	(4,732,757)

Dr. Iain Douglas-Hamilton, the world's leading expert on African elephant populations flew from Africa to testify at the hearings. He estimates the populations at 1.3 million with destruction of from 300,000 to 400,000 in 1976. Clearly, this rate of killing, mostly poaching for the ivory market, cannot continue for long, yet there is no sign that it is letting up.

In Uganda, Kabalega Falls National Park had 14,309 elephants in 1973; by 1976 there were only 2,448. Rwenzori National Park went from 2,731 to 704 in the same period. (Testimony of Dr. Brown).

In "A State of Blood, The Inside Story of Idi Amin" by Henry Kyemba (New York, Grosset & Dunlap, 1977) we learn, "The army is vigilant about suppressing smugglers who represent competition to their own smuggling operations." (p. 234) The initial source of Amin's wealth is described by Kyemba as follows, "In Amin's dealings with the Congolese gold and ivory no records were ever kept. The goods came by truck to his house. He did not have to account for what he sold. He simply began to bank for himself very large sums, regularly and in cash—up to 300,000 shillings at a time—amounting to something like a million dollars in all." (p. 29).

Representative Beilenson's testimony at the hearings emphasized the need for a ban on trade in elephant products. The major portion of his statement follows:

"In the early 1970's, reports from East African wildlife experts alerted me to the over-exploitation of elephants to supply the world's demand for a luxury item—ivory. In 1975, as a Senator in the California state legislature, I introduced legislation to ban the import to and sale of elephant ivory in California. At that time, my efforts were unsuccessful in the face of organized opposition from ivory traders. However, the next year, India banned the export of Asian elephant ivory, and the Department of Interior reciprocated by listing the Asian elephant as an endangered species. The California state legislature, realizing the additional pressure this would put on already threatened African elephant herds, passed my bill which totally banned the import of all elephant ivory to California.

"However, legislation by one state alone is not sufficient to reduce the contribution of this country to the destruction of the largest living land mammals. Thus, on November 15 of this year, I introduced a bill (H.R. 10083) to ban trade in elephant products nationwide and to ask other nations to join in suspending trade in ivory....

"In 1976, the U.S. received over one-quarter of the carved and uncarved ivory exported from Hong Kong, the largest ivory trading center in the world. The United States must take the lead to stop the growing trade in elephant ivory and to alert consumers to the wanton waste of a species which they encourage for the satisfaction of frivolous desires.

"Only a total ban on trade in elephant products will stop the imports. Partial prohibitions on trade have been ineffective

ally, as my bill does. We should formally propose to the Convention on International Trade in Endangered Species that all trade in elephant products cease until large and healthy elephant populations have been re-established over broad geographic areas where elephants have traditionally roamed."

The Department of the Interior reacted to the Beilenson challenge by proposing to list the African elephant as "threatened" and offered the public a choice of four ways to curb ivory smuggling. Only the total ban on importation into our country can give effective help to the elephants. Those wishing to express their support for the ban should write to Hon. Cecil Andrus, Secretary of the Interior, Washington, D.C. 20240.

RECENT POPULATION ESTIMATES FOR THE AFRICAN ELEPHANT
(from Douglas-Hamilton, 1977c)

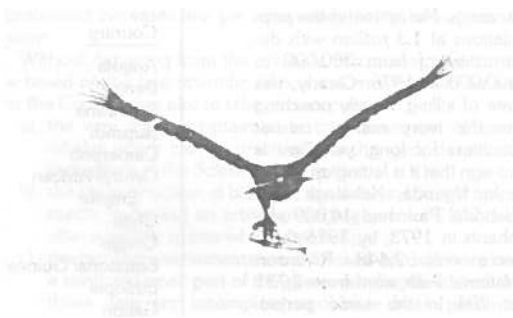
Country	Provisional Minimum Population Estimate	Population Trend	Information Available
Angola	5,000	Decreasing	Little
Benin	600	Decreasing	Considerable
Botswana	25,000	Probably stable	Nearly complete
Burundi	Unknown	Unknown	None current
Cameroon	7,000	Increasing in North;	Little
Central African Empire	68,500-103,000	Decreasing in South	Considerable
Chad	15,000	Decreasing rapidly	Considerable
Congo	2,000	Decreasing rapidly	Little
Equatorial Guinea	Unknown	Unknown	None current
Ethiopia	500	Decreasing	Little
Gabon	Unknown	Unknown	None current
Gambia	Recently extinct	—	—
Ghana	1,000	Decreasing in some areas; increasing in others	Little
Guinea-Bissau	Recently extinct	—	—
Ivory Coast	5,000	Decreasing rapidly	Considerable
Kenya	55,000-75,000	Decreasing rapidly	Nearly complete
Lesotho	Recently extinct	—	—
Liberia	200-1,000	Decreasing	Little
Malawi	2,800-3,200	Decreasing slowly	Considerable
Mali	1,000	Decreasing	Little
Mauritania	Possibly small relict pop.-10	Unknown	Little
Mozambique	1,500-5,000	Unknown	Little
Namibia	2,000	Stable	Considerable
Nigeria	1,200-1,500	Decreasing	Considerable
Rhodesia	22,000	Decreasing slowly	Considerable
Rwanda	170	Stable	Nearly complete
Senegal	400	Decreasing	Considerable
Sierra Leone	100-500	Decreasing	Little
Somalia	13,000-25,000	Increasing	Considerable
South Africa	7,750	Stable	Nearly complete
Sudan	50,000	Unknown	Little
Swaziland	Recently extinct	—	—
Tanzania	300,000	Probably decreasing overall	Nearly complete
Togo	100	Unknown	Little
Uganda	4,000	Catastrophic decline in 1973-6	Nearly complete
Zaire	300,000	Unknown	Little
Zambia	350,000	Decreasing	Considerable

Total Minimum Population Estimate for Africa: 1.3 Million

NEW REPORT ON A CRUEL TRADE

"The Bird Business," by Greta Nilsson reports on the importation of cage birds into the United States. Sponsored by the World Wildlife Fund, the Humane Society of the United States, the Animal Welfare Institute, the Fund for Animals and Defenders of Wildlife, it documents the numbers of birds imported, and the quarantine station system which is supervised by the U.S. Department of Agriculture to ascertain the presence of Exotic Newcastle Disease—a major threat to the American poultry industry. Costs to the American taxpayer are estimated at \$100 million for the U.S.D.A. Newcastle Disease Control Program since 1972. In 1976, over 282,000 birds entered the country for the purpose of sale as pets, but only 178,000 were released from the quarantine stations. The remaining birds (36.7%) died of Newcastle and other diseases or were refused entry due to exposure to the disease.

The world-wide trade of birds is increasing as prices rise due to the aggressive salesmanship by bird dealers of exotic pets; wild populations of birds are being depleted by the removal of an estimated 5 million birds per year in South America, Africa and Asia for the cage bird markets in Europe, Japan and the U.S. Mortality in transport and captivity is high, and public knowledge of avian biology and the care of birds is minimal. The risk to the environment of escaped birds becoming established is of great concern to ecologists, since well over 20 species of cage birds have already become residents of the continental United



EAGLE RESCUED FROM LEGHOLD TRAP

Don Reese of Dorris, California observed a golden eagle flying with a leghold trap in which it had been caught. He followed it until it became entangled, and succeeded in removing the trap from its foot.

In response to congratulations on this humanitarian effort, Mr. Reese wrote in part: "Enclosed are prints of the golden eagle which I rescued near Dorris in September of this year. I have added some comments which though not official, since I am now a member of a public agency, are based on some familiarity with the problem. The problem breaks down into two unrelated functions: wildlife conservation, and mitigation of cruelty.

"Penalties relating to eagles are already strict enough. Enforcement," he points out, "is the problem . . . Though the steel trap is at best an indiscriminate contrivance, much modification could be done." Reese recommends, "Outlaw the use of the oldstyle non-offset jaw 'bonecrusher.'" He also points out that landowner predator trapping is too much exempt from responsibility such as daily checking of traps and use of a state assigned number stencilled on the trap. "It is obvious that laws relating to bait placement are being violated, or birds of prey would not be caught," he writes. "Who wouldn't be willing to have a rancher reimbursed for what little damage, for example, eagles might do to lambs, if the damage, indeed, is taking place?"

Mr. Reese also suggested that eagles would benefit from more intensive management and protection and less "dragnet extensive approach." Mapping the habitat of each pair of golden eagles in the Western States (a pair ranges over 200 to 400 square miles) and the flyway and wintering areas of the bald eagle. "Know where they live, and the problem of protecting them is easier," says Reese. "They are easy to spot. Even intermittent surveillance by members of private associations such as the Audubon Society would be of great benefit. Wildlife officials cannot possibly do the job alone."

And, finally, he bemoans the destruction of habitat. "For example, 18,000 acres of pristine public land still exists in one block here in Butte Valley, a haven for 125 pronghorn antelope, a pair of eagles and other wildlife, all of which would disappear if agricultural interests get their way in development through the federal Bureau of Land Management."

ANIMAL WELFARE INSTITUTE

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INFORMATION REPORT

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YOKO MUTO RECEIVES SCHWEITZER MEDAL FROM AMBASSADOR MANSFIELD IN TOKYO



Ambassador Mansfield and Miss Muto

In recognition of her eight years of devoted care of thousands of dogs undergoing experimental surgery at Tokyo University Medical School, the Albert Schweitzer Medal of the AWI was awarded to Miss Yoko Muto. The presentation was made by Hon. Mike Mansfield who retired as Majority Leader of the U.S. Senate in 1976 and is now serving as United States Ambassador to Japan. The ceremony took place in the embassy in Tokyo on April fourth.

In presenting the medal, Ambassador Mansfield said:

"Some of you may know that a gold replica of the Albert Schweitzer Medal of the Animal Welfare Institute was presented to Dr. Schweitzer himself in Oslo, Norway in 1954. Since then, this annual award has gone to men and women who, because of their compassion for all the creatures of this earth, have made an outstanding contribution to animal welfare. The recipients include the late Senator Hubert Humphrey, Rachel Carson, the author of *Silent Spring* and former United States Supreme Court Justice Abe Fortas. These are but a few of the names on a long list of those who have worked for the better treatment of animals. To this distinguished list, today, we add the name of Miss Yoko Muto.

"Miss Muto started to work for the Japan Animal Welfare Society in 1970, and for the past 8 years, has applied herself diligently and unselfishly to her chosen field. She has been singled out for her compassion and willingness to go that extra mile to help animals, in whatever way she can. The record shows that Miss Muto thought nothing of working on holidays and weekends to ensure that the animals were fed and that she invariably did all she could to see that they were as comfortable as possible. Of course, these are but a few of the reasons why she was selected to receive this award. The many reasons can perhaps be best summed up by the inscription on the medal, which reads: 'We need a boundless ethics which include the animals also.' Because she has taken these words to heart, I am pleased to present this medal to Miss Yoko Muto."

ALTERNATIVES FOR INHUMANE SCIENCE FAIRS

by F. Barbara Orlans, Ph.D.

The long-time offender of humane standards, the International Science and Engineering Fair (ISEF) was held May 14-18 in Orange County, California. The situation was interesting because this fair, whose permissive rules governing animal study by high school students allow severe pain infliction, was held in California where a humane state law prohibits painful science fair projects. However, the California law applies only to high school student projects conducted within-state, whereas the

A PERSPECTIVE ON OUR NATION'S EFFORTS TO PREVENT EXTINCTION OF SPECIES

by Tom Garrett

The Pleistocene epoch, beginning about three million years ago, produced the greatest flowering of the age of mammals. Sixty thousand years ago, however, in Africa, there occurred the first of a series of wholesale extinctions. About 40 percent of the larger mammals on the continent became extinct within a few thousand years.

In Europe, from 30,000 to about 10,000 years ago a similar wave of extinction carried to oblivion about half of the larger mammals: Merck's rhino and the woolly rhino, the mammoth and the straight tusker, the steppe bison and the Irish elk to name a few.

Then, in North America, with the end of the great Wisconsinian glaciation, 10-13,000 years ago, there occurred an episode of catastrophic mass death that swept from the earth 70 percent of the genera of large North American mammals: the American mastodon, the giant beaver, the giant ground sloths, new world camels and horses, the dire wolf, *Felis atrox* the plains lion.

The sudden mass extinctions, affecting in most cases the largest and the strongest mammals, adapted to climatic vicissitudes and free of natural enemies, occurred in each case with the emergence or invasion of advanced human hunting cultures. All evidence points to these hunting cultures as the major and probably the sole agent of extinction.

As human hunting cultures reached South America there passed, along with the glyptodonts and the giant armadillo, the last ground sloths and the last new world horses. The arrival of human hunting cultures in Australia resulted in the extinction of 40 percent of the larger marsupials, including Diprotodont, a wombat the size of a rhino.

The human invasion of Madagascar a thousand years ago resulted in the extinction of about 40 percent of the species of lemurs, including *Megaladapus* who was as large or larger than a gorilla and all of the other large diurnal lemurs; a pigmy hippo, a giant fossa, and the elephant bird which nested in great numbers on the coastal plains, and whose eggs—the largest known from any bird—may still be found. With the colonization of New Zealand by the Maori about 800 AD there passed from existence 22 species of moas, giant ground birds which had assumed the terrestrial niche normally occupied by mammals. Of this order, only the little kiwi, which survived by its insignificance and fossorial habits, is extant today.

It would appear, following the extinction of the more vulnerable species, that pre-civilized hunting cultures may have come into a liberation with their environments. However, with the advent of civilization there was unleashed against the already impoverished postpleistocene fauna a new and more terrible and implacable assault, compressed in time, concentrated in ferocity.

In 300 years, an evolutionary flick of an eyelash, an entire suborder of unique and magnificent mammals, the great baleen whales, have been brought within sight of biological extinction by human whalers. Most of this has occurred within our lifetimes. Within a century, our forefathers destroyed the vast flights of the passenger pigeon. In half a century, following the extinction of the eastern bison, the plains bison was pushed as a deliberate policy of the US military bent on subjugating Indians to the lip of the abyss of extinction. Within 20 years from its first encounter with humans, the Steller sea cow was extinct.

It was through the efforts of a small group of Americans led by Dr. William Hornaday at the close of the last century, that the plains bison was spared extinction. Since that time there has been what a modern media type might call a "spreading backlash" against the destruction of species. The National Bison

EXTINCTION OF SPECIES

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the millinery industry. Excess killing of most game birds and animals was gradually curbed, and depleted populations restored.

This trend in the United States was matched by trends in other nations. The restoration of the pronghorn in the western US in the 1920's and 1930's, for example, found its counterpart in the restoration during the same period of the Saiga antelope on the Soviet steppes.

Twelve years ago, after authorizing various pieces of legislation to succor individual species such as a 1958 bill to restore the Hawaiian goose, or Nene, this committee reported out our nation's first "across the board" legislation to protect endangered species. It has twice strengthened this legislation. The Endangered Species Act of 1973 is one of the strongest and most comprehensive pieces of wildlife legislation ever written.

Since The Convention on International Trade in Endangered Species of Wild Fauna and Flora was negotiated under the mandate of the 1969 Act no less than forty-six nations have joined the United States in passing legislation to protect endangered species, and are now parties to the international convention. An increased recognition of the gravity of the plight of endangered wildlife appears to be seeping into the awareness of numerous governments.

Despite these seeming successes, the past decade has beyond doubt been the most disastrous in the history of the planet. The next promises to be worse. There may well be more extinctions in the next 30 years than in the last 30,000.

Today, not only individual species, but the fauna and flora of entire regions are subject to destruction, indeed are being destroyed, implacably, often irrevocably, by deforestation, desertification, laterization, erosion, urbanization, not over a course of centuries, but year by year, at a terrifying rate.

In a few more years, if the present trend continues, practically all of the unique fauna of Madagascar, including the 28 remaining species of lemurs, and most of the native flora will be gone forever. Even greater disasters are gathering in southeast Asia and in Amazonia.

Direct pressure on wildlife is everywhere mounting, reaching a state of organized extermination in parts of Africa, and to a lesser extent southeast Asia and northern South America. Animals such as the Black Rhinoceros or Grevy's Zebra, which seemed secure a few years ago, are in imminent danger of extinction through poaching.

It is a striking fact that during a time when wildlife numbers are plummeting worldwide, the importation of wildlife products into this country, and the use of domestic wildlife products, is increasing dramatically. Imports of items manufactured from wildlife increased from 1.7 million in 1972 to 91 million in 1976. Imports of skins and hides rose from 910,000 in 1973 to 32.5 million. Game trophy imports rose from 2800 in 1973 to 34,000. In these same years the status of crocodilians throughout the world, and of sea turtles throughout the world has become desperate.

Just as the amounts imported have soared, the prices commanded by many such products have mounted astronomically. The price of ivory has increased at least ten fold since 1970. Prices paid for Grevy's zebra hides increased from \$150.00 in 1972 to \$2000.00 in 1977 on the New York market. It is little wonder that this zebra faces extinction along with Hartman's mountain and Cape mountain zebras.

Enforcement, to succeed, must rise commensurately to the traffic it is forced to regulate, not to remain static in the face of vastly increased traffic. Further, if we are to prevent extirpation of species, rather than react too late as is probably the case with the zebras mentioned, we must routinely ban the importation of entire classes of products: all ivory, all zebra skins, all crocodilian skins, all turtle products.

A minor illustration of the quality of the enforcement of the Act may be found in the fact that tortoise shell from hawksbill turtles, listed as endangered since 1970, was being exported openly to Japan in 1976, from Puerto Rico, sold openly in San Juan and even advertised in "Que Pasa," the official tourist guide to the island.

The case of the Florida manatee is equally tragic. This animal is well known and well liked by the public and has been designated the Florida State animal, yet amid talk of protecting it and in the face of a clear legal obligation to protect it under two federal laws, the manatee remains without protection against the major sources of human caused mortality. The animal is sliding closer, each year, to extinction.

The current population of manatees in Florida is put at about 1000. From 1975 through 1977 the Fish and Wildlife Service lab in Gainesville salvaged and examined 183 dead manatees. Twenty-three additional deaths were verified. Other unreported mortality undoubtedly occurred. Clearly a three year mortality of over 20 percent of a population of mammals which does not mature sexually until age eight, and which may reproduce only

plants hosting wintering populations of manatees shut down, are largely preventable.

Nothing has been done by the Department of Interior to aid the animal, and almost nothing has been done by the state. Last year there were four "enforcement actions" by Interior, no arrests, no convictions. One such action, in fact, consisted in blowing a dead manatee which had been mistaken for a floating mine.

It is at this juncture, with so much dependent upon the United States activating its all but stillborn endangered species program, that the Act has come under the most determined attack in the Congress. The Senate amendment, passed July 19, is aimed at Section 7 which has been characterized as the "heart" of the Act.

The first part of Section 7 imposes a positive duty on US Agencies to use existing programs to carry out purposes of the Act, and to carry out "conservation programs" in consultation with the Secretary.

The second portion of Section 7 departs from past wildlife law which simply regulated trade and taking, by acknowledging that no species can or does exist in isolation, and that it is perfectly academic whether or not an animal is deliberately molested if its habitat is destroyed.

The obscure species which have figured in several recent controversies, are of course, part and parcel of very specific environments. Their disappearance, almost invariably, signals the functional end of the habitat in which they live in whatever region, in whatever river system comprised their range. Their disappearance signals the end perhaps of free flowing, unpolluted water on a river, the end of inland marshes in a region. The end of the snail darter, for example, would mean the end of any large, free flowing stretch of river in the entire Tennessee system, the end of a running water fishery, the end of 17,000 acres of prime bottom farmland and additional thousands of acres of forest and pasture. It would mean the end of the bond that humans had with that land before it was wrenched forcibly from them, including severance ties of the Cherokee people with ancestral sites. There would be far, far more that is absolutely irreplaceable and unique ending forever, foreclosed forever, than the little snail darter.

Most of the potential controversies which are now simmering under Section 7 involve not obscure species, but birds and mammals well known and cherished by the public. These involve, among others, grizzly bears, Asian elephants, Southern sea otters, Whooping cranes, Florida everglades kites, Bachman's warblers, Mississippi sand hill cranes, Florida manatees, Bowhead whales, Laysan Monk seals.

The Senate amendment applies to these species as much as to the snail darter. The interests pushing for amendment no more care what happens to these species than they care what happens to the snail darter.

Most of the conflicts involving these species are doubtless resolvable if the Agencies make good faith efforts to consult and to modify their projects and activities. It is hard to imagine, however, that most of the Agencies would pass up an opportunity to shunt the decision to a committee where political pressures from vested interests can be focused.

The present act sets forth a firm national policy to prevent the extinction of species, and makes it clear that no agency is exempt from the requirements of that policy. If the Senate amendment becomes law, we will then have an Act that protects endangered species only when they don't get in the way of "progress."

ALTERNATIVES FOR INHUMANE SCIENCE FAIRS

[continued from page 1]

Out-of-State Projects

The International Science and Engineering Fair*

ISEF rules sanction live animal surgery, and induction of pathological conditions. Projects are supervised. All the projects described below were judged by the ISEF standard-setting Animal Experimentation Committee as being in full compliance with the rules.

Examples

* "Danger!? Carcinogenic Effect of Trichlorethylene" was the title of a project from Sioux Falls, South Dakota. The well-known carcinogenic effects were catalogued by the youngster as follows: white mice developed sores at the base of the fur, sunken eyes, purple discoloration of feet and tail, humped back and unusual lumps. Furthermore the student encountered problems with the animals having mites and suffering pneumonia which are common signs of poor housing conditions.

* The growth of tumors in rats was the topic of a project undertaken by a student from Oklahoma City. Animals were

* It is noteworthy that obtaining information on ISEF exhibits has become increasingly difficult over recent years. A new rule this year forbids photographic display of animal surgery, dissections or autopsies. Such photos can be

subjected to a series of surgical procedures. First the ovaries were removed, then some animals also had a gland removed from the base of their brain. Finally all these animals received pieces of tumor taken from the testicles of donors and transplanted into the recipient animals' eyes. The student found rapid growth in some eye tumors. Conclusions were drawn regarding the influence of certain sex hormones on these tumors.

- Awards were given by General Motors, and by the American Speech and Hearing Association to an unscientific project showing that alcohol causes deformed babies. The 16 year old student from Greenway, Virginia, operated on pregnant mice to remove the developing babies.

- "I impaired a pigeon's vision" states the report of a high school student in Ogden, Utah in a project on birds' homing instincts. The unremarkable result was that "When I released the pigeon with the impaired vision it was confused and it did not fly directly home." The student had administered a prescription drug normally used for treating human eye infections which, in normal doses, is not toxic. General Motors awarded a 4th prize to this project.

- The stated purpose of a project entered from Louisiana was to demonstrate the already well-established fact that noise can cause severe emotional disorders in animals. Baby mice were subjected to very loud music until they became aggressive and failed to eat.

- Eleven dogs were the subject of a study reported as the work of a 17 year old student from Mount Clemens, Missouri. The project entitled "Intracardiac Conduction Alterations during Hemorrhagic Shock" was conducted in a research institution. Dogs were anesthetized and bled to produce a state of shock. Various procedures were then tried to relieve the shock. Rewards were given to the student by the American Medical Association and the U.S. Army. The National Society for Medical Research supports the view that dog experiments and dog surgery by high school students is appropriate education. The American Medical Association has, in the past, supported monkey surgery by high school students. What is the limit to what high school students should do?

Award winning projects displayed at the 1977 ISEF were reported in a recent article by Michael W. Fox and M. Andrea Ward (*The Science Teacher*, 44 (6), 1977, 31-33). Like this year, this fair included several projects with no recognizable justification. For instance, a student amputated the tails and feet of lizards to show the already well-documented fact that tails regenerate and limbs do not; the well-known poison, lead, was fed to white rabbits to confirm long established results of harm; incisions were made along the backs of rats to study the rate of healing under different conditions, but the "usefulness of the information is totally obscure," according to Fox and Ward.

ISEF-Affiliated Fairs

Reports were available from two local fairs affiliated with the ISEF. In both fairs there were cases of animal abuse.

For this year's Baltimore, Maryland science fair, a young boy surgically opened the chests of animals to observe their heart beats. He administered alcohol in the false belief that this is an anesthetic. Alcohol is not an anesthetic. When challenged by the humane judge at the time of the fair, the boy admitted that the animals "squirmed" when he made the incisions. Suitable complaints were lodged, but the harm was already done to the animals. So long as animal surgery is permitted in science fairs, such incidents will continue.

Two projects in the Washington, D.C. fair, held March 19, 1978, "certainly did display . . . cruelty" according to Thomas E. Diggs, public science supervisor, as quoted by *The Washington Post*. The D.C. science fair officials acted correctly in disqualifying the projects and forbidding their exhibition.

In contrast, the following are some of the projects exhibited by California students in their local and regional fairs and at the ISEF.

California Student Projects

The California law states that in public elementary and secondary school students projects

"no live vertebrate animal shall be experimentally medicated or drugged in a manner to cause painful reactions or induce painful or lethal pathological conditions, or injured through any other treatment including, but not limited to, anesthetization or electric shock, as part of a scientific experiment or for any purpose whatever."

Examples

- An eighth grader at the Rancho Santa Fe Middle School received a first award from the Zoological Society of San Diego for her project "Development of a Protozoan Toxicity Test" displayed at the Greater San Diego Science and Engineering Fair. This work sought to establish a method for testing toxicity

predators on each of several beaches by studying the character of the holes bored in the clams' shells. Conclusions were drawn regarding the population levels of various specifically identified predators.

- An observant girl discovered a colony of crickets all of whom had a naturally occurring abnormality in their leg development. She sought to cross breed these crickets with the crickets from another colony who had normal limb development in order to determine possible genetic influences (San Diego Science Fair).

- Three well-researched projects, one on the depletion of the whale population, one concerned with the death of wildlife resulting from oil spills and involving studies of miscibility of oil, water and soap, and one in which the student considered the similarities between non-human animals and humans were all rewarded with Outstanding Achievement Awards at the Modesto Science Fair.

- The effects of light on the activity levels of hermit crabs were carefully documented for a project which received a Special Award at the Modesto Science Fair.

- A Del Mar student investigated planaria, a flatworm commonly found in streams, to see if they can see color.

- "Recruitment Behavior of Nectar Gathering Honey Bees" was the topic of a project by a Fresno student.

- Other California students studied themselves. One project for instance was concerned with sensitivity levels of touch and another dealt with dental hygiene.

Only one project was encountered that was not in compliance with the state law. The project was disqualified, had no opportunity to win a prize, and was not allowed to be exhibited.

Californians (both high school teachers and concerned citizens) are satisfied that the law is being enforced. The quality of work produced by California high school biology students is first rate. Nothing has been lost either in sophistication or excellence of experimental work from this successful elimination of projects involving animal pain. In fact, much has been gained by providing budding biologists with a sound ethical basis for their investigations which will contribute positively to decisions they face as future scientists, veterinarians, doctors, or as future citizens. Credit goes to Senator Rodda of the state legislature and to California biology teachers for this much-needed successful establishment of meritorious standards.

California is not, of course, free from influences that promote inappropriate biology education. A new book, edited by B. L. Hart of the University of California, Davis, and published in California consists of experimental projects for undergraduate psychology students. It contains contributions from 15 Americans. It is one of two books "whose absolute lack of concern with the suffering of animals" (emphasis in original) is protested in a recent article by Dr. R. F. Drewett of the Department of Psychology, University of Durham, England (*New Scientist*, 3 Nov. 1977, Vol. 76, No. 1076, page 292).

What is particularly alarming is that whereas these inhumane books are written for undergraduate students, some of the very same projects are attempted in the U.S. by high school students. Projects involving brain surgery, the deleterious effects of well-known poisons and induction of severe psychological stress to animals are among projects advocated in one or other of these books. Projects on each of these topics have appeared in recent science fairs.

What Can Be Done

What is the solution to these long-standing problems that high school educators and science fair officials face? From my viewpoint, as a physiologist who has been personally involved in animal experimentation and who feels that humane animal study by professional scientists to obtain new knowledge is justified, I am concerned about the basic tenet on which the ISEF rules are based. In the 1960s ISEF promulgated a set of rules based on acceptance of animal surgery and infliction of painful pathological conditions on vertebrate animals by high school students. Over the years, these rules have been dressed up with certain revisions but the basic premise remains. Even though these rules have been tried for all this time, and have been shown to fail, ISEF, with the support of the National Society for Medical Research, has clung to them.

In contrast, two other prestigious national competitions for high school students have confronted similar problems of animal abuse faced by ISEF and have solved them. Both have arrived at similar conclusions. The Westinghouse Science Talent Search (WSTS) in the U.S. and the Canada-Wide Science Fair at one time have permitted exhibition of students projects involving animal surgery and animal pain. The Canada-Wide Science Fair changed its rules in two stages. Sensitive to the needs of young students to learn about mammalian physiology and to observe live organisms, the Canadians first tried rules that prohibited any pain infliction (including surgery) but which sanctioned non-painful studies. However, these apparently sensible rules did not work in the context of science fairs. Inan-

WORST MEETING OF THE INTERNATIONAL WHALING COMMISSION IN SEVEN YEARS.

The thirtieth meeting of the International Whaling Commission (IWC) opened in London, June 26th in an atmosphere of mistrust and belligerence even more acute than usual. The European edition of Time magazine, July 10, 1978, under the heading "A Whaling Ban Harpooned in London," stated in part:

"To ban or not to ban? This was to have been the conference's crucial focus. Panama's crusading commissioner, Jean Paul Fortom-Gouin, had proposed a ten-year moratorium on all commercial killing, a suggestion strongly supported by President Carter in the past. But before the conference got under way, Fortom-Gouin was suddenly summoned to his embassy, demoted and replaced by Panama's Ambassador to Britain Roger Decerega, who promptly withdrew the proposal. Why? According to a diplomatic source, the Japanese had earlier threatened to cancel a sugar deal worth \$9.75 million to the Panamanians if the ban was pressed home. The Japanese denied the blackmail charge.

"Conservationists looked for support from the U.S., traditionally a vociferous opponent of whaling, but Commissioner Richard Frank failed to fight a conference ruling that no other nation could resubmit Panama's proposal. Frank argued that the necessary three-fourths-vote majority simply was not there. More to the point, the U.S. could hardly pressure Japan and Russia into a total ban while pushing for a greater bowhead take for Alaska's Eskimos."

The Commissioner for Argentina made a stab at keeping the moratorium proposals on the agenda, inquiring whether a single delegation could withdraw an item from the agenda. But the Chairman, Arthur Bollen of Australia, who has a long history of pro-whaler rulings from the Chair, said it was his interpretation that since the moratorium was being removed by the government that placed it on the agenda, it couldn't be placed on the agenda again for another 60 days. Thus the "whalers club" disposed of the long-awaited vote with the same dispatch a factory ship uses in packing away the body of a dead whale, its identity destroyed in a matter of minutes.

It appeared that the whalers took another member aboard in the form of the U.S. Commissioner Richard Frank, Administrator of the National Oceanic and Atmospheric Administration, who expended virtually all his time and energies on trying to get the highest possible quota on bowhead whales in order to appease Eskimo whalers and, in so doing, in effect helping the Russian and Japanese whalers get the highest possible quotas, too. For every bowhead Frank got for the Eskimos, the Russians and Japanese were seeking and usually getting a thousand sei, Brydes, minke or sperm whales. Appeasement of whalers whether commercial or aboriginal, was the order of the day in the most scandal-ridden and worst-conducted meeting of the past seven years.

Nothing was done about the pirate whaler, Sierra¹, which has now acquired a second vessel,² a converted Japanese stern-trawler, and transferred its operations from Africa to the North Atlantic where it is killing fin, sei, and Brydes whales outside the quotas and selling the meat to Japan.

Populations of whales have decreased so much that, with the exception of the shocking meeting in Japan last December³ every IWC meeting since 1972 has reduced the whale quotas by hundreds or even thousands of whales. Despite these reductions, the quotas were, more often than not, unmet because the whales could not be found to fill them. This year, the IWC put off discussion on the sperm whales in the North Pacific for a special meeting in December. Its actions to date are calculated to save only 65 whales.

The failure of the Commission to set a quota to reduce the Korean catch of whales in the Sea of Japan demonstrated the inability of non-whaling countries to organize even the most obviously needed action. The traditional leadership as set by Russell Train, Robert White, and William Aron, was abandoned. South Korea, which sells approximately 60% of its whale meat to Japan while continuing to put off joining the IWC, has averaged a kill of 473 minke whales a year over a considerable period. Last year, the IWC's Scientific Committee recommended that the catch not be increased, but Korea paid no attention. When it more than doubled its kill, for a total of 1003, in 1977, the Scientific Committee Report merely expressed a weak hope that Korea would not still further increase its catching effort!

Dr. Roux, the French Commissioner, proposed a quota be set using the historic catch figure 473. Seven nations voted with France, but three voted against it: Japan, Norway and the Soviet Union. Thus, the 8-3 vote failed because of the three-quarters majority the IWC requires. The three major whaling nations blocked the wishes of the majority, and South Korea remains free to kill as many whales as it pleases, while still proclaiming that it will become an IWC member by the end of the year.

¹ New reports circulating at the IWC meeting indicate that the Sierra, heretofore secretly owned through a Liechtenstein corporation, is in reality owned by

For an overall view of what happened at this confused meeting, summaries under subject matter headings may be useful.

Quotas. Technically, the total quota was reduced by 695, but because no quota was set for Korea, 530 must be subtracted leaving 65. It is to be hoped that major reductions will be made in the sperm whale quotas for the North Pacific after the special meeting of the Scientific Committee November 18-27.

Scientific Committee. A number of governments have divested their commissioners of decision making powers by instructing the inexperienced officials they appoint to vote the recommendations of the IWC's Scientific Committee. In doing this, they fail to recognize that the Scientific Committee does not always make definite recommendations. On the contrary, the Committee, a loosely defined body which never votes but operates by consensus (with frequent references to non-consensus opinions) often hints that it is up to the Commissioners to make decisions in areas which 1) are not strictly scientific, 2) in which agreement has not been reached, or 3) in which a population or stock of whales is decreasing but for which the "New Management Procedure," a system the Scientific Committee considers itself bound to honor, demands a quota. The commissioners generally hope to "play it safe" by sending decision-making back to the Committee. The United States official position was to support the most conservative position for whales whenever the Scientific Committee failed to reach consensus. In practice, however, this did not always occur.

Soviet Union. Commissioner Nikonorov, accompanied for the first time in three years by crack Soviet lawyer Lafitsky, speaks sonorously in Russian, and his pronouncements sometimes dwell on an alleged Soviet love of nature but they are totally uncommunicative of any Soviet activity with respect to whales. When Mexican Commissioner Rozental politely inquired, "Would it be possible for the Soviet delegation to inform the Commission what use is made of the 178 gray whales taken?" Mr. Nikonorov stated through his interpreter that he had already answered this question when Mr. Rozental was not present and would speak with him privately about it. In fact, no statement had been made by Nikonorov on this subject. It is rumored that meat from the 178 gray whales the Soviets kill every year, allegedly for essential subsistence for native peoples, is being used on mink farms.

Recollection of the report of the friendly young gray whale tugging on the hawser of a California whale-watching boat⁴, of the fact that this huge but gentle creature allowed thirty-three people to pat her, and that she returned to play with them again the following day, makes the idea of a Russian harpooner blasting her with an explosive harpoon in order to feed caged mink to sell in the Leningrad fur auctions, especially revolting. If Commissioner Nikonorov is not prepared to state publicly what becomes of the gray whales who venture past his nation's shores, we can hazard a guess that this is no subsistence kill for starving aborigines.

Brian Jackman reported in *The London Sunday Times* that a Russian fleet allegedly killed nearly 2000 whales over the quota. No serious investigation of the matter has been made, and the only nation that even tried to persuade the IWC to look into it was the United States. Every other nation on the IWC Infractions Committee (whose meetings were closed to observers) voted against investigation. The other members, USSR, Australia, Brazil, Japan and Iceland, are whaling nations. All of them except Brazil also opposed an expanded observer program. In short, they want business as usual and no questions asked.

According to U.S. Commerce Department figures, Japan has received all of Russia's whale exports since 1973. In 1976, over ten million dollars changed hands.

Cost of operating whale catchers has risen steeply, as evidenced by the current Russian price of about \$190,000 for a month's charter in a proposed IWC marking and sighting program in the Indian Ocean, three times the figure quoted last year. The charter was never taken up for lack of funds.

In 1977, Nikonorov stated in an interview⁵ that it cost \$95,000,000 a year to put the Soviet Whaling fleet on the seas. Figures like these suggest that the killing of whales is a mere excuse for sending out the huge motherships crammed full of electronic gear. But they continue to decimate the whales. Even the little orcas, the star performers at U.S. oceanariums, worth \$250,000 alive, are slaughtered by the Soviets in the antarctic. Last year they harpooned 77 orcas, an increase of 350% over the numbers killed in the past eight seasons. The IWC doesn't even attempt to put brakes on the killing of small whales.

Japan is fighting hard to protect its dying industry. In so doing it is making itself increasingly unpopular. And though it now kills only half as many whales as the Soviet Union, it provides the market for whale products that has prevented whaling from dying a natural death in a number of other countries.

Commissioner Yonezawa, unlike his Russian counterpart, speaks up for more whale killing on every possible occasion during the meetings. He urged that no quota be set for Korea; he urged the Commission to leave sperm whale quotas at the

concerns expressed with respect to several different stocks by the Scientific Committee. He, together with the commissioners from other whaling countries opposed a further meeting of the Scientific Committee on the grounds that it would cost too much, and when the Whale Protection Fund offered to pay the cost of the meeting, the Commission would not accept the money, the Russian Commissioner stating that "It is not that we are so poor that we must extend our hand to this or that organization. I don't think we should do that as a matter of principle."

Not only did Japan seek the highest possible quotas, its commissioner opposed proposals that would lead to more open regulation of whaling. For example, he spoke against providing copies of observers' reports on request, saying that these might be used later on to prosecute, and that the observer might be facing a libel suit or damage suit. He wanted observer reports to be limited to contracting governments and members of the delegation.

When the question of receiving and considering documents from non-members including observers was brought up, Mr. Yonezawa tried to delay any action for a year by saying it would be "wise for the Commission to look into the costs involved. I think we should, before deciding at this meeting, refer this matter to the Finance and Administration Committee for comment."

When the International Union for Conservation of Nature (IUCN), the leading international organization whose scientific contributors throughout the world make possible the publication of the famous "Red Data Book" on endangered and threatened species, was recommended for advisor status in the IWC, Mr. Yonezawa stated "I would like to register my objection to this proposal," and he succeeded in preventing IUCN from obtaining that status. It remains as a mere observer.

Disastrous though this meeting was, the fact that public indignation against commercial whaling is growing more rapidly throughout the world than ever before—gives reason for hope. The whalers are fighting back using disreputable methods suggestive of a desperate last-ditch effort to gain their ends.

Friends of whales can help tip the balance in the following ways:

1) Write to Secretary of Commerce Juanita Kreps urgently requesting her to place on the agenda of the next IWC meeting a moratorium on pelagic (deep sea) whaling. Point out that 75% of whales are killed beyond the 200-mile limits of any nation's shores and that only three nations still engage in pelagic whaling: Russia, Japan and, to a very limited extent, Norway. This vote can be won if a serious effort is made by the Carter Administration.

Hon. Juanita Kreps
Secretary of Commerce
14th and Constitution Avenue
Washington, D.C. 20230

2) Write to Secretary of State Cyrus Vance urging him to pursue established U.S. policy for a moratorium as a matter of priority.

Hon. Cyrus Vance
Secretary of State
2201 C Street
Washington, D.C. 20520

3) Boycott Russian and Japanese products and write letters to let the makers know why. Some addresses:

Stolichnaya Vodka and
Nazorovya Champagne
Pepsi-Cola
Anderson Hill Road
Purchase, N.Y. 10577

Aeroflot Airline
545 Fifth Avenue
New York, N.Y. 10017

Baikal and MZ Shotguns
Universal Sporting Goods
7920 NW 76th Avenue
Miami, Fl. 33166

Toyota
2055 W. 190th Street
Torrance, Ca. 90504

Datsun
18501 S. Figueroa Street
Carson, Ca. 90744

Sony
9 West 57th Street
New York N.Y. 10019

ETHICAL QUESTIONS OF WHALING* by Roger Payne, Ph.D.

Research on whales demonstrates that they are in possession of unusually large brains. Although there is no general agreement on what the function of these brains may be, it is a principle of evolution that such a complex organ does not develop in a species unless it confers an advantage on the survival of that species.

Recent research on whales has demonstrated that some species have very complex repertoires of sounds; that other species make sounds that can carry over distances of thousands of miles; that still others sing long, complex (and, to human ears, beautiful) songs, that these songs are constantly changed according to laws of form that are remarkably similar to some laws of human musical composition, and that these laws are inherited culturally or genetically. The function of the songs and the reason they change so constantly are unknown, but the ability to memorize a song lasting perhaps 25 minutes, and to incorporate in it all of the complex annual changes, presumably indicates something of what the whale's brain can do.

In at least four separate laboratories in the United States, there is research currently in progress on techniques for communicating with cetaceans. Though different in detail, these efforts are essentially modifications of techniques pioneered by primatologists for teaching American Sign, computer, and symbolic languages to chimpanzees and gorillas. The early emphasis in that research was on demonstrating that some non-human animals are capable of the same abstractions necessary to communicate via human languages. That chimpanzees and gorillas are capable of such abstraction is now widely accepted.

The current research with porpoises, though it employs the same techniques, has a different emphasis. One current direction is an effort to learn more about behavior of porpoises in the wild by teaching a porpoise a simple language and then asking it simple questions. Conversations are envisioned such as: "Before you came here, how many fish did you eat each day?" or "Did sharks ever attack you?" or "Do you like it here?". Questions of this and of greater complexity have been asked of and answered by non-human primates, and present indications suggest that porpoises will do well in such tests. If so, animal behaviorists may soon resemble their anthropologist colleagues as regards study techniques—interviews with the subject may become a principal tool of investigation in animal behavior.

We have been discussing research projects that are currently underway, not simply plans for the future. Should these projects yield positive results (and current indications strongly suggest they will—and soon), it would probably seem ironic, if not unethical, to many more people than have hitherto been involved in questions of whale conservation, to recognize a value for porpoises and whales only in relation to how much they contribute to human nutrition or in respect to their worth as lubricants.

The problems of research with large whales are manifest, experimentation under controlled conditions is unknown, and we must be content at present with simple observations. In spite of these limitations, it is already obvious that whatever it is cetaceans use their large brains for, it is almost certainly not the same as what humans do with theirs. Thus, regardless of the answer, it promises to be one of the most intriguing discoveries of the future. By continuing whaling, we threaten this mystery; we threaten the legacy we leave for our descendants, and, thus, we threaten our options as a species.

In the United States, we spent, during 1975, more money on seeing live marine mammals (in zoos and aquaria, on whale-watching tours, in television specials, and in books and magazine articles) than the largest whaling nation made from whaling. It is clear from this and from the increasing presence of whales in the literature, art, music, sculpture, dance, conservation efforts, news media coverage, and legislation of this country that an increased awareness of the values of whales in their live state makes the practice of whaling unacceptable to U.S. citizens on ethical grounds.

* Prepared for submission to the International Whaling Commission, 1978.

AUSTRALIA STOPS KILLING WHALES

On the opening day of the Australian official Inquiry on Whales and Whaling before Sir Sydney Frost, the last Australian whaling company announced that it was ending its operations this year. Thus Australia joins the ranks of ex-whaling nations. It is vital that its quota not be taken by Russia or Japan.



ALTERNATIVES FOR INHUMANE SCIENCE FAIRS

(continued)

problems that more stringent measures are needed than for curricular classroom projects. Nationwide revisions therefore retained these rules only for classroom projects but established more stringent rules for science fairs. The Westinghouse Science Talent Search, however, made their rule change abruptly when in 1969, protests were made over a prize-winner who had blinded sparrows then starved some to death.

The significant factor is that both these competitions, through different routes, arrived at the same conclusion. Both competitions now ban all high school surgery and all animal experimentation except non-harmful observational studies of pets and wildlife. Both competitions have thereby successfully eliminated inhumane projects. Both competitions reward excellence in science and stimulate bright youngsters.

The state of California and two major national competitions have achieved good standards. These experiences show us that humane study of live animals can continue in biology classrooms but toleration of improper standards is not necessary. Alternatives to inhumane science fairs exist, are used, and should be made universal.

LAW ENFORCEMENT

Bird Dealers Found Guilty

According to a recent news media account, the owners of Basically Birds in Alpine, California, have been found guilty of charges involving smuggled birds. The owners, William Hampton and Marion Martinez, pleaded no contest. Hampton was sentenced to 18 months in prison and given a five-year probation. He was fined \$5,000. Martinez was not given a prison sentence but was put on five years' probation and fined \$2,500. (Reported by R. O. Wagner, American Association of Zoological Parks and Aquaria).

Endangered Species Violator Convicted in New Mexico and Kentucky

On February 27, Thurman Wit of Albuquerque, New Mexico, was sentenced on two counts of having violated the Endangered Species Act of 1973 by attempting to shoot two whooping cranes north of the Bosque del Apache National Wildlife Refuge. Apprehended by special agents of the Fish and Wildlife Services Division of Law Enforcement, Wit was sentenced on the first count to six months in jail, of which he must serve 30 days, plus three years of supervised probation. On the second count, he was given three years of supervised probation and forbidden to hunt or even carry firearms for three years.

On the same date, Ronnie Dale Nanney of Hardin, Kentucky, was sentenced on one count of having violated the Bald Eagle Protection Act by shooting an immature bald eagle. In passing sentence, Judge Edward J. Johnstone emphasized the seriousness of Nanney's offense and the importance of protecting the Nation's wildlife. Accordingly, Nanney was sentenced to one year in jail (suspended); active probation for three years, during which time he will have to work on a conservation project for 80 days; forfeiture of his rifle; and a fine of \$2,500, which is believed to be the most severe fine ever imposed in a bald eagle shooting case. (*Endangered Species Technical Bulletin*, April, 1978).

WANTED: BIRD SMUGGLERS

Smuggled birds continue to threaten the health of pet bird and poultry flocks in the United States. Indications are that every recent outbreak of exotic Newcastle disease has been caused by birds brought in this country illegally.

At a meeting on poultry health, sponsored by the U.S. Department of Agriculture (USDA), representatives of the pet

bird and poultry industries said they wanted to help counter the threat by reporting suspected smuggling activities.

U.S. Customs Service, therefore, has made available the phone numbers of its regional directors for investigations. Any information concerning the possibility of smuggled birds may be reported to one of the following officers:

Boston, MA 02110 (617) 223-0086
New York, NY 10008 (212) 466-5940
Baltimore, MD 21202 (301) 962-2637
Miami, FL 33131 (305) 350-5331
Chicago, IL 60603 (312) 353-9226
Houston, TX 77002 (713) 658-8339
New Orleans, LA 70112 (504) 589-2747
San Francisco, CA 94105 (415) 556-1780
Los Angeles, CA 90053 (213) 688-4692

Information concerning the possibility of smuggled birds may also be reported through USDA at Hyattsville, MD (301) 436-8061.

"PRAISE IS DUE . . ."

In an editorial which summed up the good news about the dramatic drop in dolphin casualties in purse seines, *The Los Angeles Times* gave credit to "the environmentalists for demanding protection of the porpoise, the government for imposing the lower quotas, and the tuna captains for accomplishing what they said was impossible." The April 17th editorial appears in full below.

FISH STORY

American tuna captains went on strike a year ago to protest government restrictions on the number of porpoises that they could kill in their nets. The fleet laid at its moorings for 90 days in a futile effort to secure higher quotas on the air-breathing mammals, which accompany schools of tuna and guide the crews to their deeper-swimming quarry.

The skippers said that the 1978 kill quota of 51,946 porpoises would force them to return to port with half-empty holds, while foreign vessels, not bound by the regulations, could stay on the fishing grounds much longer.

As it turns out, those fears were unjustified. The catch by the 130 American seiners is above last year's, and the porpoise slaughter is dramatically lower.

As of March 20, the catch of skipjack tuna was 56,762 tons—24,155 over last year. There was a smaller gain in the yellowfin catch—52,660 tons, compared with 46,429 in the first quarter of 1977. And, far from returning to port with small catches that would not even cover the costs of a voyage, 88 of the seiners have gone to canneries in California and Puerto Rico with full holds—a majority of them twice.

During the same three months, only 2,038 porpoises died in the nets. At that rate, the kill for the entire year would be only a fourth of the allowable quota of 51,946.

There were a number of reasons for the fleet's success—new seines that permit more porpoises to escape, greater care in freeing those still caught in the three-quarter-mile-long nets, and the presence of government observers on a number of the vessels.

The future—for the fleet and the porpoise—looks even brighter. The U.S. Tuna Foundation, which represents the fishery, is spending \$1.6 million to test still-newer nets and maneuvering techniques. Six government scientists will sail with the crew of an experimental seiner on five voyages this year. Those efforts should reduce porpoise mortality even further—and without harm to the industry.

Still another beneficiary is the consumer. Tuna prices, which rose sharply last year, are heading down because of the larger catches.

Praise is due environmentalists for demanding protection of the porpoise, the government for imposing the lower quotas, and the tuna captains for accomplishing what they said was impossible.

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INFORMATION REPORT

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EXPERIMENTS ON ANIMALS IN THE UNITED STATES AND DEVELOPING SUBSTITUTES

by Christine Stevens

PRESENTED AT THE WORLD CONGRESS FOR ANIMAL PROTECTION — WEST BERLIN
SEPTEMBER 27, 1978

Crisis in Testing Thousands of Compounds Spurs Interest in Alternatives to Laboratory Animals but Massive Suffering Continues in Animal Experiments

In the United States, the Environmental Protection Agency and the National Institutes of Health are devoting substantial efforts to development of tests for toxicity of the ever increasing number of drugs, additives and other compounds which find their way into the bodies of human consumers. The motivation is practical. Live animal tests take longer, are more expensive and provide a wider opportunity for error than do corresponding tests using bacteria or tissue culture, but none of the tests is perfect. Methods which eliminate use of conscious, live mammals, or which put off such use until a new compound has run the gamut of *in vitro* tests, are being developed under contract to the National Cancer Institute. For example:

A \$161,949 per annum contract initiated June 30, 1975 is designed to "develop rapid and reproducible screening assays for chemical carcinogens in epithelial cultures" using rat liver epithelial cultures.

A \$228,412 per annum contract initiated June 30, 1975 is designed "to develop and validate a reliable and reproducible assay system for the demonstration of neoplastic transformation in a cell culture system using BALB/c3T3 mouse embryo fibroblasts."

A \$332,991 per annum contract initiated June 9, 1971 is titled "In Vitro Study of the Nature of the Interaction Between Chemical and Viral Carcinogens."

A \$59,041 per annum contract initiated March 29, 1978 "To determine the predictive value of a mammalian cell system using DNA repair as an end point in the evaluation of chemical compounds for carcinogenic potential."

A series of 21 other contracts in the same general range of funding were initiated between 1972 and 1978 under NIH's *In Vitro* Carcinogenesis Program.

EPA's work in progress is primarily on mutagenicity tests which will also predict carcinogenicity. In late 1978 and in 1979, EPA will be supporting development research on *in vitro* systems for teratogenicity. Studies are also underway to assess and improve existing animal toxicity methods including the reduction in required numbers of animals and species to adequately define potential toxic effects, for example, those in which both the rat and the dog have been used in the past.

These are encouraging signs.

Further encouragement to the process would be provided under a bill sponsored by Congressmen Drinan and Green in the U.S. House of Representatives, H.R. 10484. The bill "to promote the development of methods of research, experimentation and testing that minimize the use of, and pain and suffering to, live animals" states that "the Secretary of Health, Education, and Welfare is authorized to make grants to public and non-profit private entities to support research into, and the development of, new methods of research, experimentation and testing (including computer modeling and analysis of tissue cultures), which methods use no or fewer live animals or produce less pain and suffering in such animals than the methods currently in use." The proposed authorization would be for ten million dollars per year for five years.

Successful development of even one such test could save far

ANIMAL WELFARE PROGRESS IN THE NINETY-FIFTH CONGRESS

Animal Birth Control

For the first time, funds for research in animal birth control will be available from the U.S. Department of Agriculture. Senator John Melcher (D., Mont.) proposed an amendment to the agricultural appropriations bill on the floor of the Senate to include twenty million dollars for veterinary research, recommending that five percent be allocated for research in animal birth control. The Senator said, "We have it almost within our grasp to provide for humane methods of controlling predators, decreasing the population of unwanted and uncared for dogs and cats. Stray dogs and cats in almost all communities are a drain financially, a public health problem, and humane control through lower birthrates is in my judgment a necessary and prime goal." The Senate passed the Melcher amendment. Although the House of Representatives conferees brought the total down to five million, Secretary of Agriculture Bob Bergland confirmed that an additional ten million for special grants to animal health research is available. Thus, up to \$750,000 should be distributed in the general area of predatory and other animal birth control. Information concerning grant applications should be addressed to Dr. E. J. Splitter, Cooperative Research, Science and Education Administration, U.S. Department of Agriculture, Washington, D.C. 20250.

Humane Slaughter

The Federal Meat Inspection Act was amended to require that all meat for human consumption be slaughtered by humane methods. The new amendments provide authority for the inspectors to stop the slaughtering line until any abuse or malfunction of humane slaughter equipment is corrected. This highly effective principle is copied from the authority the inspectors have had for many years to stop the line if sanitary standards are not maintained. The inspector affixes a notice which is removed only when compliance is re-established.

The new humane slaughter amendments to the 1958 law also deny entry into the United States of meat from inhumanely slaughtered animals.

mutagens (most, if not all mutagens are also carcinogens), also reports that it may soon be possible to determine not only mutagenic/carcinogenic which chemicals are mutagenic but the extent of their potency. 'There is an indication,' Professor Ames states, that there is a quantitative correlation, not only with carcinogens in the same chemical class, but across a broad range of classes! Since there are about 63,000 chemicals presently in common use, with new ones being added every day, such a quantitative correlation based on the relatively easy and inexpensive Ames test (two days and \$250, while white-mice tests for carcinogenicity average about \$150,000 per chemical and can take many months) could prove vastly important in protecting the public from cancerous chemicals."

It frequently happens that by protecting animals people are better protected too. Thus we should be able to enlist a broad range of support for our efforts to replace painful experiments on animals.

Painful Experiments

To do so it is essential to recognize the scale and the nature of the suffering currently being inflicted. During the past year, the Animal Welfare Institute has conducted an intensive examination of the literature concentrating on the last three years, using some computer searches but depending largely on library research covering twenty-five or thirty of the major journals



Fig. 1. Photograph of Monkey S-11 seated in the restraining chair with attached neck yoke. Lateral head movement was restricted by the rectangular stops on either side of the monkey's head, and vertical head movement by the base plate of the neck yoke. Movement of the upper body was permitted through an arc determined by the hinge located above and to the rear of the monkey's head. Pressurized air was delivered to the monkey's face through the curved stainless-steel tube (covered with black tape). One end of a flexible polyvinyl chloride tube was connected to the stainless-steel tube behind the neck yoke, and the other end to the solenoid-operated valve (not shown) located below the waist plate of the chair. The front and left side walls of the chair were removed for the photograph.

EXPERIMENTS ON ANIMALS IN U.S.
[continued from page 1]

will note that these are not "vivisection" in the classic sense. Surgery is not necessarily involved though it may be as an adjunct. Experimental surgery, especially on dogs, continues to cause a great deal of pain and distress, much of which could and should be alleviated by post-operative use of pain relieving drugs, good nursing care, and careful feeding. We must press for these needed improvements through law enforcement and other means of persuasion. And we can observe through visits to laboratory animal quarters what progress is being made.

Punishment

With respect to psychological experimentation, however, which is most often responsible for merciless persecution of captive animals through painful and uncontrollable electric shocks, observations in the animal house are inadequate and it is necessary to turn to reports in scientific journals. There is an entire literature based on "punishment" and "punishers" consisting of electric shocks to the feet, shaved tails, tooth pulp, or brains of primates, cats, dogs, rabbits, hamsters, rats and mice. Animals are taught to avoid shock by such methods as pulling levers or pecking keys, then the game is suddenly reversed, so the creature is deliberately frustrated to the point that he develops ulcers. For example, "... when [rhesus] monkeys were put into a marked conflict situation in which avoidance responses which had previously always prevented shock and now unpredictably delivered shock, lesions [ulcers] developed in seven of the eight subjects." (*American Journal of Digestive Diseases*, 22 : 888-897, 1977).

Depending on his species the animal subject may squeal, tremble uncontrollably, defecate, run frantically, freeze, curl up in a ball or in certain types of experiments develop what is called "learned helplessness"—a state in which he no longer even tries

Some creatures simply die as four squirrel monkeys did after a 24-hour shock avoidance session in which shocks re-occurred at five second intervals if not avoided. The paper cites "... the emotional reaction and anxiety which are involved in attempting to contend with the shock stress. Stress-induced death was related to helplessness or giving up reaction which was accompanied by a depression of cardiovascular function." (*Psycho-Physiology*, 14 : 322-328, 1977).

A forthright scientist criticized in print an experiment in which heart attacks were induced in dogs following which they were repeatedly subjected to electric shocks while confined to Pavlovian slings. He wrote: "The small amount of information gained by the experiment of Corbalan et al is overshadowed by the detriment to the medical profession in general and to animal experimentation in particular. The design of their experiment is not in compliance with the guidelines published in the Code of Federal Regulations, Title 9, Chapter 1, Part 3, Section 3.0, Paragraph c(3) stating that the use of three classes of drugs (anesthetics, analgesics and tranquilizers) shall effectively minimize the pain and discomfort of the animals while under experimentation. . . . Future reports of similar experiments should be rejected by every reputable medical journal." (*The American Journal of Cardiology*, 37 : 116, 1976).

"Punishment" is commonly inflicted on pigeons by shocks through electrodes implanted around the pubis bone. The pigeons may be starved to 70% of their normal weight, to increase their desire for the grain they have been taught to expect as the result of pecking the correct key. Then a shock is administered with each key peck and the effect of various drugs tested. (*Chemical Pathology and Pharmacology*, 13, January 1976, 1-7).

Electric shock experimentation appears to require little skill, which may partially account for its unfortunate popularity. The tolerance of the editors of some journals seems boundless. A student seeking a Master of Arts degree, for example, trained cats to walk or trot on a tread mill by using food rewards, or by

covered that "food cats walked more upright," while ". . . a cat walking to avoid shock maintains a crouching posture." (Physiology and Behavior, 16 : 141-146, 1976).

It is hardly surprising that some of the animals have sought to outwit the designers of the experiments. Footshock is commonly used in the enormous number of shock experiments on rats and some of these creatures have learned that "Footshock, even when scrambled, can be drastically altered in effective duration or intensity by rearing, hopping or jumping; and some experimentally-sophisticated rats have been observed to balance on single grid bars, lean against non-conductive walls, or even roll over onto their fur-insulated backs. Even more sophisticated experimenters have lowered ceilings, shaved fur off animals, and removed all insulated apparatus surfaces, but animals are still able to alter shock aversiveness by subtle postural adjustments. . ." (Physiology and Behavior, 19 : 815-818, 1977).

The authors offer a system unmodifiable by intelligent rats — but they also cast a question over the accuracy of a great deal of past work.

When extreme pain is caused as it so often has been, this is a most serious matter. To quote from a paper that examined the effects of two kinds of pain on cats: dull pain through electric shock to tooth pulp, "bright" pain to their feet. "Since 14 mA was the maximum amount of current that could be generated by our apparatus, it was not possible to determine if foot shock levels greater than that would have led to escape responding." These unfortunate cats endured this powerful maximum shock to their feet because the dull, diffuse pain to which they were also being subjected caused them to "assume a fixed posture with limbs extended." (Journal of Neuroscience Research, 2 : 283-289, 1976).

Immobilization

Dogs restrained in Pavlovian slings, monkeys in monkey chairs, small animals in plastic tubes, all are shocked — or, in some cases, other forms of "quantifiable and effective punishing stimulus" are used. This squirrel monkey is rigidly restrained and pressurized air is blown in varying degrees of severity into his face. He was one of six "food-deprived squirrel monkeys exposed to a multiple fixed-ratio schedule in which every thirtieth lever pressing response produced food. . ." and who was then subjected to the much-hated blasts of air between the eyes without being able to turn his head. Small wonder that, hungry though he was, it "effectively suppressed the ongoing level of responding." (The Experimental Analysis of Behavior, 29 : 341-345, 1978).

Blinding

He might be counted lucky as compared with a blinded squirrel monkey with electrodes implanted in the brain whose "paucity of movement and lack of appetite suggest a physiological effect . . . it was common to discover the blind squirrel monkey . . . with its head between its knees, tail over its shoulders." (Archives Italiennes de Biologie, 114 : 23-48, 1976).

Rhesus monkeys blinded and later subjected to hallucinogens "manifested increased vocalizations during hallucinogen sessions" and one died after administration of one of these drugs. (International Pharmacopsychiatry, 11 : 150-156, 1976).

Five 19-day old macaques had their eyes removed to study social interactions, such as measurement of the time it took them to reach their mothers after being separated from them — a test repeated with the mothers sedated to the point that they did not give alarm calls. (Journal of Abnormal Psychology, 84 : 519-523, 1975).

Blinding is so terrible a form of injury that it has, in the past, rarely been undertaken. Yet examples such as these show a willingness to permanently deprive highly developed animals of their vision, not even with the aim of helping to prevent or cure blindness in human beings but for psychological studies.

Solitary Confinement

Total isolation imposed on 15-day old Rhesus monkeys who remained in their cells for eight months without seeing any living creature showed the results by self-clasping, rocking, huddling, self-mouthing and self-aggression. The paper concluded that the "data argue against the isolation syndrome in monkeys as a model for human psychoses. . ." (American Journal of Psychiatry, 133:1165-1170, 1976). How, then, is eight months of solitary confinement for these infant primates to be justified?

Pain and Fear

Or how do the psychologists interested in "Geophagia in Response to Stress and Arthritis" justify the pain they caused by producing "a generalized arthritic syndrome of pain, heat, and joint swelling" in rats and then forcing them to swim in cold water? "The stressed rats squealed loudly while being placed in the swim tank," state the authors. But squealing did them no

Burning

We all know the painful sensation that follows even a small burn, but in none of the studies noted in the Diner report is any mention of post-burn analgesia made. The actual burning is done under anesthetic but there pain relief ends. In three recent papers in which guinea pigs were immersed in boiling water only one even provided post-burn anesthesia. In this case, "whiffs of halothane" were given "before being burned and for approximately five minutes afterward" to the guinea pigs which, the authors state, "was long enough to ensure that they felt no pain as indicated by the absence of squealing." The animals were kept alive up to 72 hours after the burn injury. (American Journal of Physiology, 231 : 892-902, 1976. 232 : E415-418, 1977. 233 : E80-85, 1977).

139 dogs suffered experimental burning of the esophagus with lye and were kept alive for six weeks unless they lost 15% or more body weight as the result of severe constriction of the esophagus. They were divided into three groups to test the effect of two different treatments. However, histologic study of the injured esophagus of the dogs after they were killed showed that the "sequence of injury and repair events was indistinguishable among the three groups." (Surgery, 81 : 431-435, 1977). The large numbers of dogs subjected to such an extremely painful intervention calls for scrutiny of the way in which this experiment was planned. There was no mention of pain relieving drugs during the six weeks. Like many others in the report, it was funded by the National Institutes of Health.

Drumming and Forced Fighting

The Noble-Collip Drum, a Canadian invention, was thought by many humanitarians to have faded away since it was severely criticized by six scientists writing to *The Lancet* in 1949. Unfortunately, recent papers show that the University of Mississippi, Albany Medical College, and the State University of New York at Brooklyn are still subjecting rabbits and rats to traumatic shock by spinning them hundreds of times inside the drum where they hit the projections that are built into the drum to produce the bruising injuries for which this instrument is famous. (American Journal of Physiology, 230 : 7-13, 1976), (Journal of Surgical Research, 22 : 370-375, 1977), (American Journal of Physiology, 231:842-847, 1976), (American Journal of Pathology, 70:57-62, 1973), (Laboratory Investigations, 35:501-506, 1976), (The Journal of Trauma, 18:38-42, 1978).

One of the strangest current phenomena in the scientific literature is the popularity of encouraging animals to fight each other by giving them painful shocks. "All pairs emitted shock-correlated audible vocalizations during the inter-shock interval when attacks occurred," states a study designed to measure ultrasonic vocalizations occurring in shock-elicited aggression. In this study, pairs of albino rats were placed in a small chamber for 5-10 daily fighting sessions and subjected to fifty separate shocks each session. (Animal Learning and Behavior, 5:199-202, 1977).

Some of the aggression studies border on the bizarre. Who would have thought that a student might achieve a Master's degree by producing "Trained fighter mice" placing them in a glass battery to battle spayed female mice smeared with the urine of male mice that had been injected with various hormones, and carefully recording the number of bites and other aggressive acts? (Behavioral Biology, 22 : 343-353, 1978).

A favored method of encouraging one mouse to bite another is to dangle the so-called "victim" mouse by the tail bumping it into the fighter mouse's hindquarters till he becomes impatient enough with the annoyance to bite the unfortunate victim. A surprising amount of government funds from such institutions as the U.S. Public Health Service and National Science Foundation seems to be available for studies of this nature in psychology departments throughout the country as indicated in the forty-six papers summarized in the AWI report.

It is clearly essential that, at the same time that alternatives to laboratory animals are being developed in some fields, a reduction in suffering inflicted on the millions of animals now undergoing experiments and tests be made. With that end in view, the AWI has prepared a policy statement.

Animal Welfare Institute Policy on the Use of Vertebrate Animals for Experimentation and Testing

Abstract: Animals should be used for experimentation only 1) when there is no known feasible alternative; 2) after review of a carefully designed experiment based on knowledge of existing literature on the subject; 3) using the smallest possible number of animals 4) of the most suitable species, 5) maintained in an optimum environment, 6) under the care of trained, sympathetic personnel, and 7) preventing pain, fear, and anxiety by judicious experimental design and generous use of anesthetic, analgesic and tranquilizing drugs. 8) Endangered species should not be used; 9) Threatened species should only be used for experiments conforming with requirements for human experi-

testing are known to be available they should be used in preference to any experiment likely to cause pain or fear to an animal.

2) If the experiment or test can be conducted on a fully anesthetized animal it should be, and, if injury is caused, the animal should be destroyed without regaining consciousness, OR:

3) If it is imperative that the animal survive the injury inflicted, sufficient pain-relieving drugs must be administered to prevent each animal from feeling pain.

4) Nursing care must be provided to all animals following surgery or other injurious interventions.

5) Competent staff should be available at all times, day and night, weekends and holidays to care for experimental animals. They must make rounds for the purpose of ascertaining the state of the animals' health and well-being. They must be authorized to dispense pain-relieving or tranquilizing drugs or, where specified, to phone the investigator or director for such authorization with regard to specific animals at any time.

6) Before undertaking any experiment involving animals, the experimental design must be reviewed by a committee including a senior scientist in the discipline involved, a veterinarian familiar with the treatment, care and management of the species of animal involved, and a person primarily concerned with the welfare of animals. Purpose of the review is to ensure 1) that it is not feasible to substitute for the use of animals, 2) that the least possible distress and injury is caused, 3) that excessive numbers of animals are not used, and 4) that appropriate anesthetics, analgesics and tranquilizers are employed if needed. In those special circumstances in which the investigator feels his research would be marred by general anesthesia or use of narcotic alkaloids, this should be given special scrutiny by the review committee, and, if necessary, by a further impartial authority. The committee must also ensure that no experiment is undertaken by a person untrained in the methods to be employed and that the kind of animals selected are the ones most likely to develop the new knowledge or test result being sought.

If a disagreement between the investigator and the institutional committee cannot be resolved, and the design of the experiment is questioned either 1) on the basis of inadequate preparation and review of the literature and sound scientific conception, or 2) on the basis of the humane considerations listed above, the proposal should be submitted to an objective committee or arbitrator who is not associated with the institution and a decision taken based on evidence requested or submitted to the committee or arbitrator.

7) No endangered species should be used for experimental purposes. Threatened species should only be used under constraints which prevent risk of death or serious injury as required in human experimentation. Capture and transportation of wildlife for laboratory use must be subject to regulation and inspection both nationally and internationally.

8) The great majority of experimental animals are bred for the purpose. This is the preferred method of acquiring animals. They should be raised in facilities whose standards of housing and care are equal to those described in this statement for animals under experiment. Dogs and cats, for use in experiments under full anesthesia from which they are not allowed to recover but pass directly into death, may be obtained from among animals already condemned to death in pounds because no homes can be found for them. This simply constitutes a change in the place where euthanasia is conducted. Transportation and handling of these and all other animals must be humane, providing the same high standards of sanitation, ventilation and temperature control as for animal quarters. Transportation should be conducted by the most rapid means feasible. The size of the cage must permit normal postural adjustments for any animal.

9) Euthanasia must be considered a major responsibility. Animals should be killed by anesthetic overdose and their inability to recover ensured by surgical means. No animal should be discarded without holding it long enough after death to observe rigor mortis.

Housing of experimental animals must be so constructed and maintained as to provide for the activities natural to the species. Enclosures or cages must be sufficiently large and well constructed to permit burrowing, climbing, perching, swinging, walking,

stretching, rolling, or other normal actions ordinarily seen in the species when not confined. Any exceptions to such basic rules for housing for purposes of a particular experiment must be considered as part of the experimental design and reviewed as outlined above.

If funds are not available for housing any particular species comfortably, providing a diet which will maintain optimum health, providing veterinary and nursing care following surgical or other adverse experimental intervention and providing high standards of sanitation, ventilation and temperature control at all times, the experimentation should not be undertaken.

Well trained staff who like animals and sympathize with their feelings are essential. They must be observant and make their observations known to the director of the laboratory or other person with authority to act in all cases. For example, moribund animals should be euthanized. Suffering animals should be, depending on the situation and the nature of the work, euthanized, anesthetized, sedated or otherwise treated to prevent suffering.

Experimental animals, sacrificed for human benefit, should be provided optimum living conditions before, during, and after their use. This is a minimum repayment for their services — the only one which can be made.

Painful animal experiments should not be conducted for any frivolous or non-essential purpose; therefore, new products should be tested to the greatest extent possible using substitutes for living, conscious vertebrates; and where known substances are being evaluated, safe and painless human testing should be substituted, as, for example, in the way that new soaps, creams, and other cosmetics are tested by leading manufacturers.

Where obviously harmful effects can be predicted by the chemical or physical properties of a new product, for example a strong acid, it should be automatically given a warning label without requiring further animal testing.

Tests of products in different countries should be coordinated to eliminate useless duplication. Experiments or tests should not be carelessly repeated merely because it is easier to use animals than to search the literature or because a competitor will not release his test data. Duplication of an experiment or test should be undertaken only for a genuine scientific reason.

In closing, I wish to emphasize the great importance to individual experimental animals of the way in which they are housed and cared for. I have drawn attention to some instances of what is actually done to the animals under experiment by citing examples from current journals. However, there are also many experiments which are far less hard on the animals, but nevertheless cause them to suffer because they are so closely confined and lack the most basic provisions for their well being. The U.S. Federal Animal Welfare Act passed in 1966 and amended in 1970 and 1976 brought about discard of the worst of the hideously cramped cages in which large animals such as dogs and monkeys could not even raise their heads or stretch their legs; however, laboratory animals need and deserve more than bare minimum standards in their housing and maintenance. Therefore, education and public demand is necessary in addition to legislation.

The Animal Welfare Institute publishes manuals which it provides free on request to laboratories. The new revised edition of *Comfortable Quarters for Laboratory Animals* is in press at this moment. It contains illustrations of the best institutional housing for laboratory animals we know of. Supplemented by *Basic Care of Experimental Animals* in English and Spanish and *Animal Expressions*, a photographic footnote to Charles Darwin's *The Expression of the Emotions in Man and Animals*, and a film, "Laboratory Dogs", the program gives humane scientists and administrators the tools they need to improve conditions for the animals in their institutions.

To persuade institutions to spend the necessary funds, humane citizens must demand good treatment for laboratory animals. The last two pages of the new *Comfortable Quarters for Laboratory Animals* shows a laboratory that uses cell cultures. Wherever alternatives to laboratory animals are adopted, the funds saved should be applied to better housing and care for the remaining animals. All humanitarians should insist upon decent treatment of these animals that suffer and die for human beings.

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