

**Report on the
Biomedical Primate
Research Centre
Netherlands 2001**

by Janie Reynolds



LIVING ANIMALS AVAILABLE

PAN TROGLODYTES – CHIMPANZEE

AGE RANGE 0-30 YRS.

FOR RESEARCH ACTIVITIES CONDUCTED, COLLABORATIVELY, AT THE BPRC.

ALL AGES AVAILABLE

PREGNANT/TIMED FEMALES

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Introduction

The last remaining biomedical research laboratory in Western Europe to use chimpanzees in medical research is located in The Netherlands. It lies between The Hague and Delft, less than ten miles from the Dutch Parliament.

The Biomedical Primate Research Centre, in Rijswijk (pronounced Rise Waike), is situated near a residential area, surrounded by fences, barbed wire and water filled moats. It shares its grounds with other (non-animal) laboratories. Approximately 85 people work at the facility, less than a quarter of whom are researchers.

The BPRC houses over 1,500 primates, including 112¹ chimpanzees, making it Europe's largest primate facility. Although the laboratory presents itself as a "centre of excellence", its housing facilities for the animals are grossly inadequate, even compared to common standards in the laboratory industry. In a letter dated 18th October 2000, the Dutch Minister for Education, Culture and Science himself described these standards as "outdated" and the current primate facilities as "comparable to an old fashioned zoo".

The BPRC keeps chimpanzees for use by European, Asian, African, and other, researchers. Some chimpanzees at BPRC are housed in isolation. Other young chimpanzees are deprived of maternal care. Over 500 macaque monkeys are kept in individual cages at the BPRC, not of sufficient size to allow the full stretching of their bodies. In most cases little enrichment is provided for the animals. Physical, and even, eye contact with other monkeys is practically impossible for many of these animals. As a result of such conditions, these naturally sociable macaques exhibit stereotypic behaviours that are characteristic of chronically understimulated and distressed individuals, such as spinning and rocking in their cages.

A visit to the BPRC, in 1995, by the UK pressure group People Against Chimpanzee Experiments (PACE), found chimpanzees at BPRC began to exhibit stereotypic rocking behaviour as young as only two years of age. Oxford University primatologist, Vernon Reynolds², reported groups of six to eight infant chimpanzees, housed together in the absence of a mother, exhibiting abnormal behaviour and clear signs of distress. Some adult chimpanzees were housed individually with no social contact and had been so for many years. One small room housed infants who had been separated from their mothers; the walls of this room had been stripped of wallpaper and the window smeared with faeces, clear indications of extreme boredom and distress of the inhabitants. Other chimpanzees at BPRC threw themselves at the walls of their cages as people walked past, or spat at them. Spitting at others in chimpanzees is not behaviour observed in the wild, but is learned in captivity by angered animals.

A second visit, on March 1st 2001, by representatives of the Coalition to End Experiments on Chimpanzees In Europe (CEECE), confirmed that conditions for primates at BPRC have not changed since that time.

¹ This figure obtained on 1st March, 2001

² Professor Vernon Reynolds, Primatologist and Biological Anthropologist, Institute of Biological Anthropology, Oxford University.

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The newly established Coalition to End Experiments on Chimpanzees In Europe (CEECE) represents millions of European Union taxpayers. The coalition aims to provide information to stimulate and facilitate a European Union ban on the use of great apes in medical research, the closure of the BPRC and the relocation of the primates to retirement sanctuaries. Appendix I of this report provides a review of key scientific papers that demonstrate the striking intellectual and emotional similarities of chimpanzees to humans and a chimpanzee's capacity to be self-aware, to feel pain, sadness and loneliness, and to anticipate future scenarios. In addition to the moral absurdity of experimenting on other hominoids, chimpanzees, whose intellectual abilities and emotional sentience are comparable to that of a two year-old human child, CEECE objects to the environmental conditions in which the BPRC primates are kept. In addition to these objections, some of the coalition's recent research suggests that the value and validity of a selection of key research programmes at BPRC is negligible (see Appendix II).

Funding for BPRC comes from three main sources: the Ministry of Education, Culture and Sciences, in The Hague; the European Commission (see Financial Objections, below); and from pharmaceutical companies and charities. For many years the BPRC was on the verge of bankruptcy. Growing awareness of the conditions there prompted a government grant of 15 million Dutch guilders (Dfl), awarded to BPRC for the purpose of improving housing facilities³. However, such measures can only be temporary reprieves. The BPRC should no longer be considered a viable institution – financially, scientifically or ethically – and its continued funding by the Dutch government and the European Union runs contrary to the policies both organisations have implemented to reduce the number of animals used in research. Moreover, the funding of the BPRC using taxpayers' money – Dutch, British and European Union – goes against the wishes of the many citizens who feel that medical research on great apes, or indeed, in many cases, all non-human primates, is both unnecessary and unacceptable.

The following report strongly recommends that legislation be introduced to prohibit the use of great apes in research as a matter of morality. It also recommends that the Dutch government and the European Union cease their funding of BPRC, and assist the animal protection community in the relocation of the primates to retirement sanctuaries.

³ Grant of DFL 15 million from the Dutch Ministry of Education, Culture and Science (Ministerie van Onderwijs, Cultuur en Wetenschappen, OCW), the Ministry responsible for government policy on the BPRC. This grant was offered in October 2000.

Part 1

The continued use of hominoids (great apes) in research

Chimpanzees are hominoids along with human beings, bonobos, orang-utans and gorillas. Chimpanzees have 98.4 % of their genes in common with the 30 – 40, 000 human genes present, and are more closely related to humans than they are to gorillas. Their intelligence and awareness has been compared to that of a two year-old human child⁴. They possess many qualities that were once considered solely human attributes. Although this does not make them more “deserving” than other species, it does put them at the top of the list for most people when it comes to ethical decisions. Euthanasia, for example, is not considered an option for laboratory chimpanzees no longer used in any research project⁵.

Of the hominoids, chimpanzees, bonobos, orang-utans and gorillas are great apes. Of the great apes, chimpanzees are the predominant species to be used in biomedical research. As more is learnt about the behaviour and social habits of chimpanzees, there is growing ethical concern about their use in laboratories. The social and environmental requirements of these animals are so complex that it is simply not possible to keep the animals in a manner appropriate to their species under laboratory conditions.

Appendix I provides a review of key scientific papers that demonstrate the striking intellectual and emotional similarities of chimpanzees to humans and a chimpanzee’s capacity to be self-aware, to feel pain, sadness and loneliness, and to anticipate future scenarios⁶.

At BPRC, some chimpanzees have been, or are presently, housed in isolation for significant periods of their lives, in barren cages, deprived of maternal or social contact and significant or appropriate environmental enrichment. This is an ethical absurdity.

A 1993 report⁷ by the BPRC states:

“We are in regular contact with the International Primate Protection League to find an international solution, where chimpanzees which have been used for research can be retired to a safe, semi-natural environment for the rest of their natural lifespan.”

In 2001, no such regular contact exists and all of the BPRC chimpanzees remain in steel cages, in Rijswijk.

⁴ Dr. Jane Goodall, primatologist.

⁵ Institute for Laboratory Animal Research, Commission of Life Sciences, National Research Council, USA (1997): Committee on long-term care of chimpanzees.

⁶ For such a review, plus anecdotal evidence demonstrating chimpanzee intellectual and emotional capacity, see appendix I.

⁷ European Centralised Chimpanzee Facility (ECCF), “Preclinical Studies for Evaluation of Effective Vaccines and Therapeutic Strategies for AIDS”. BIOMED 1 Yearly Progress Report

One reason for the continued use of great apes within the European Union may be that, until 1999, no ethical committee existed within the structure of the European Commission department responsible for funding such experiments⁸. Only in 1999 was a review body established within the European Community to consider proposals submitted by researchers wishing to work with primates, on ethical grounds. Before this time only scientific justification was taken into consideration before EU funds were allocated. In 1999, as part of the European Community's Fifth Framework Programme for research, an "Ethical Review Panel" was established, consisting of recruited or independently nominated experts from a variety of professions and European Union countries. It is hoped that such a panel may facilitate communication of moral and ethical objections to the continued use of great apes for research within the European Community.

On March 27th, 2001, key animal protection organisations in the UK and the Netherlands united to call for an end to the use of great apes in research and the closure of BPRC. The Coalition to End Experiments on Chimpanzees in Europe (CEECE) is supported publicly by Sir David Attenbrough, Dr. Jane Goodall and Dr. Desmond Morris. The objections of these three leading animal behaviourists are, for the most part, ethical in nature.

Breeding programmes

Due to a breach of policy, at least seven chimpanzees have been born at the BPRC in the last year. There are several more under the age of three years. In 2000, two babies were born into a group being used for hepatitis research and, so, were separated from their mothers at birth. Such treatment causes immense suffering to both infant and mother, who in natural situations would remain inseparable for a year, stay together for five years, and often maintain lifetime closeness.

A recognised surplus of chimpanzees in research institutions worldwide, and the cramped conditions within the chimpanzee housing facilities at the BPRC, led to an agreement within the BPRC to cease the breeding programme for chimpanzees, via the administration of contraception to female chimpanzees. This decision has been breached on the above-mentioned occasions.

It is not infrequent that chimpanzee newborns are rejected by their mothers at the BPRC. In these cases, the infants are raised in incubators. The forced removal from, or rejection of infants by, their mothers causes a great deal of distress for both parties.

Research has indicated that maternal privation causes cognitive deficits in the deprived individuals, which cannot be reversed, no matter how much environmental and social stimulation the affected individuals receive later in life⁹. These cognitive deficits are

⁸ EU funding for primate research projects at the BPRC is allocated by the Directorate F – Life Sciences: health research department of the Research Directorate-General Commission of the European Communities, Brussels, Belgium.

⁹ For example, Davenport, R. K., Rogers, C. M. and Rumbaugh, D. M. (1973): Long-term cognitive deficits in chimpanzees associated with early impoverished rearing. *Developmental Psychology*, **9** (3):343-347.

frequently manifested in the form of psychotic behaviour in chimpanzees as early as the age of two years, at the BPRC¹⁰.

HIV/AIDS research on chimpanzees at the BPRC

The vast majority of the 112 chimpanzees at the BPRC are not used in any experiment. It is thought that approximately 30 chimpanzees have been used in human immunodeficiency virus (HIV) research at the BPRC. The first was Coen, who as a young male was infected with uncultured blood cells from an AIDS patient in 1982. The large surplus of redundant chimpanzees can be blamed on a European Union-funded breeding programme in the 1970s and 1980s, specifically aimed at production of chimpanzees for use in research into HIV. The department responsible for this programme is the Brussels-based, European Commission's Research Directorate-General¹¹, presently under European Commissioner Phillipe Busquin.

One of its remits is the allocation of centralised EU research funding. Over the past twenty years, however, medical understanding of HIV and AIDS has advanced considerably, and most virologists now acknowledge that the chimpanzee has proven to be an unsuitable model for the study of HIV and AIDS in humans¹². Yet, HIV research is still permitted on chimpanzees at the BPRC.

A low-level of HIV research on chimpanzees continues to take place at the BPRC, and this is one reason why it remains in the public spotlight. This fact should not, however, justify the BPRC's existence, but quite the reverse, as the numerous objections are so compelling.

When infected with HIV, chimpanzees do display an immunological response, but they never develop AIDS, even though they continue to harbour the virus for the rest of their lives. The initial marked rise in the production of 'killer' T cells shown when chimpanzees are infected with HIV is followed by a reduction in the HIV, a reaction also noted in most humans. But the third phase of HIV infection differs markedly between these two species. In humans, HIV lies dormant in the body for 5-10 years, after which time it inserts itself into the DNA of the host person's immune cells (the T cells are designed to destroy the virus) and destroys them, leaving the person with no immune defences against common diseases. In all of the chimpanzees artificially infected with HIV, except one chimpanzee in the USA¹³, there is no third phase. The sacrifice of monkeys and chimpanzees after infection with HIV, and the dissections of human victims of AIDS, reveals that in monkeys and humans the lymph nodes are

¹⁰ Visit to BPRC in 1995 by Professor Vernon Reynolds (PACE), Institute of Biological Anthropology, Oxford University.

¹¹ This Directorate Generally was then known as DG XII – Science, Research and Development.

¹² Several papers criticising the validity of the chimpanzee as a model for HIV/AIDS research can be found in *Poor Model Man: Proceedings of PACE's conference on the use of chimpanzees in biomedical research*. *ATLA* 23: 571-651. 1995.

¹³ Chimpanzee "Jerom" was infected with HIV-SF2 aged 30 months, HIV-LAV1 aged four and also aged four with HIV-NDK at the US. Yerkes Regional Primate Research Center, Atlanta, Georgia. He died of an "AIDS-related syndrome" in 1996, when he was thirteen.

overwhelmed with viral infection, whereas in chimpanzees normal lymph nodes remain. Why this occurs is not known, but clear differences between a chimpanzee's immune system and our own are responsible. Chimpanzees have, what has been termed, an HIV suppressive factor and the absence of cells necessary for HIV pathogenicity.

Certain researchers have used the argument that the fact that chimpanzees do *not* develop AIDS is a justification for using them. However, research into what differs between the immune systems of the two species, man and chimpanzee, when HIV is present, has shown to be inconclusive. More importantly, even if those elements of a chimpanzee immune system, involved in the prevention of HIV development, were to be detected and identified, this could not assist in the control of HIV infection within the human system because such elements simply are not present in humans, due to hundreds of thousands of years of differing evolutionary mutation in the two different species.

According to the recent Roundtable Discussion¹⁴, which brought together leading researchers in the field of HIV and AIDS research, many in the pharmaceutical industry have been paralysed with pessimism after a decade of desultory and ambiguous findings. Jose Esparza, from the World Health Organisation (WHO), a contributor to the discussion, concedes that more than ten years of research and spent animal life has: "provided more questions than answers...more problems than solutions." He argues that the symptomatology between species involved in vaccine trials varies enormously, powerfully indicating that animal models are irrelevant to the human condition

Chimpanzees, and other primates, that have been experimentally infected with any disease which is transmittable to another animal, are housed alone or with another identically infected animal. Access to the outside is not permitted and socialisation with non-infected animals is prohibited. At the BPRC, healthy young chimpanzees have been used in AIDS research at ages where they would naturally remain very close to their mothers. Despite extreme ethical concerns raised by such practice, the psychological effects of such maternal privation and isolation are well-documented to have significant effects on the mammalian immune system, thereby obscuring the scientific clarity of any research carried out on these animals.

Support for working on chimpanzees within the American scientific community is reducing significantly. Indeed, in the USA there are no current contracts for studying chimpanzees for AIDS vaccines.

As early as 1996, the journal *Science*¹⁵ reported on the US National Institutes of Health panel evaluating AIDS research who recommended:

"redirecting some of the \$10 million that the National Center for Research Resources (NCRR) now spends on chimpanzees".

This recommendation was based on the panel's opinion that chimpanzees:

"are an inferior animal model for AIDS pathogenesis".

¹⁴ Journal of AIDS & Human Retroviruses)

¹⁵ Cohen, J. (1996): Overhauling AIDS research: views from the community. *Science*, **271**:590-591.

Dr Ronald Kennedy of the University of Oklahoma, USA, who has over a decade of experience in AIDS vaccine research, said this about chimpanzee experiments¹⁶:

“Only a few chimpanzees have demonstrated symptomatology associated with disease following experimental infection. So, even in the seemingly most relevant animal model, whether or not a vaccination strategy will prevent disease following HIV-1 infection is difficult to assess.”

Mark Feinberg, a leading AIDS researcher, has argued against the use of primate models in HIV/AIDS research¹⁷:

“What good does it do you to test something [a vaccine] in a monkey? You find five or six years from now that it works in the monkey, and then you test it in humans and you realise that humans behave totally differently from monkeys, so you’ve wasted five years.”

One British virologist, in particular, has spoken in the past against the need for chimpanzees in HIV vaccine research. Professor Jonathan Weber of Imperial College, London, is quoted, in a letter to PACE¹⁸:

“I should certainly be delighted to explain how increased human experimentation could take the place of the vast majority of chimpanzee work.”

Despite the growing calls, mainly from the USA, for HIV/AIDS research on chimpanzees to cease, research continues within the European Union, at the BPRC. This research can be criticised not only on scientific grounds, and therefore on the grounds that it is a waste of valuable public funds, but it also results in great suffering for the animals concerned. HIV-infected individuals pose an infection risk so they need special treatment for the rest of their lives. As a result they are kept in environmentally poor conditions, in isolation, for anything up to 60 years.

Chimpanzees and hepatitis C research (HCV)

At least two separate hepatitis C research projects on chimpanzees are taking place at the BPRC. HCV is the new “buzz-word” in medical research, fast replacing HIV as the fashionable disease to be finding cures for. HCV is the “silent virus” with infected people showing no symptoms after infection for 15-25 years. An estimated 200 million people are infected with the virus worldwide. It eventually causes chronic liver disease and can lead to a progressive deterioration of the liver; in the most severe cases, patients may die of cancer or liver failure.

¹⁶ Kennedy, RC (1997). *Nature Medicine* 3:501-502.

¹⁷ Quoted in Greek, C.R. and Greek, J.S. (2000): *Sacred Cows and Golden Geese*. Continuum. p. 183.

¹⁸ Weber, J. (14 July 1992): Letter to PACE

Dozens of companies are trying to develop treatments for HCV, including drugs, preventative vaccines and even therapeutic vaccines. Two vaccines are now in early clinical trials, but it's too soon to say whether they actually work in humans.

HCV does not multiply effectively in cell culture and so it has been difficult to produce large quantities of the virus for research – larger amounts are gained by studying the virus in live chimpanzees. The lack of a test-tube method for studying HCV has also delayed the testing of anti-viral drugs.

Chimpanzees are the only animals apart from humans known to be infected with HCV. Like humans, they can remain persistently infected with HCV for years. However, importantly, unlike human patients they do not develop progressive liver damage, according to Dr Hugo Rosen, a professor at Oregon Health Sciences University in the USA. He states that “The chimp offers a very different model system than the human¹⁹,” for HCV.

For example:

- Cellular signs of HCV infection in the liver, seen under the microscope, are not the same in chimpanzees and humans.²⁰
- Damage in the liver of chimpanzees is almost always mild²¹ whereas in humans it can be very severe, sometimes requiring liver transplantation.

Despite the genetic similarities between chimpanzees and humans, significant differences in viral infection, disease progression and immune function have been documented between the two species, for example in HIV/AIDS research. This is likely to be true for HCV as well. After all, the effectiveness of a leading hepatitis C drug (consensus interferon) in humans varies from three per cent among blacks, to twelve per cent in whites and thirty per cent in Asians.

Alternative approaches

On pragmatic grounds alone it can be argued that, given the lack of understanding of the virus, it is too early to conduct trials of drugs and vaccines in chimpanzees. Chimpanzee experiments are too slow and costly to be used as early tests for drugs or vaccines. Chimpanzees' lives will also be wasted, which is ethically unacceptable.

The key to searching for new treatments is a rapid, low-cost screening system in vitro, such as the use of cell cultures. A greater research effort is needed to find the right types of cells and conditions which will encourage the virus to multiply in the test tube.

In the meantime, studies of human patients – both those who resist the virus and those who succumb to it – are the most reliable way of finding out more about how the virus infects the body, causes disease and ways the immune system might fight it. More detailed use of such clinical data in developing mathematical models would be

¹⁹ A vaccine for hepatitis C? Roger Smith

²⁰ A vaccine for hepatitis C? Roger Smith

²¹ Schaff, Z et al (1992). Ultrastructure of normal and hepatitis virus-infected human and chimpanzee liver: similarities and differences. *Acta Morphol Hungary* 40:203-214.

valuable, as this approach profoundly influenced understanding of HIV infection in AIDS and led to improvements in treatment.²²

In conclusion, there is little understanding about how HCV penetrates the body's defence or how new treatments could work. Nevertheless, researchers are pressing ahead with chimpanzee experiments, which will cause suffering and waste lives.

BSE research on chimpanzees at the BPRC

In an open letter to the magazine, *Nature*, the BPRC advertised its primates, including chimpanzees, for research into transmissible spongiform encephalopathies, when concerns were raised about the impact of bovine spongiform encephalopathy (BSE, also known as “mad cow disease”) and its human equivalent, new variant Creutzfeldt-Jakob disease, on public health. In a joint letter published in 1996, the BPRC researcher, Peter J. Heidt, proposed subjecting the BPRC chimpanzees to:

“intra-cerebral injection of BSE brain and beef and administration of infected cow brain and meat, and perhaps even milk by the cutaneous, intravenous and...oral route”.

However, soon afterwards *Nature*²³ published letters objecting to the scientific validity of these recommendations. Even H. Schellekens, a former virologist and deputy director of the BPRC, wrote in to criticise their proposal on scientific grounds. Any plans to infect chimpanzees at the BPRC were abandoned. Currently, no BSE research is taking place at the BPRC.

²² Walker, CM (1997). Comparative features of hepatitis C virus infection in humans and chimpanzees. *Springer Seminars in Immunopathology* 19:85-98. G Langley. BUAV.HCV.2.01

²³ Schellekens, H. (1996): Spending on BSE research. *Nature*, **383**:211

Progressive legislation

Around the world, a consensus is growing that the use of great apes (chimpanzees, bonobos, gorillas, orang-utans) in experimental research is not morally acceptable. Great Britain led the way in 1997 by legislatively banning²⁴ the use of great apes in experiments for ethical reasons. New Zealand followed, in 1999, banning the use of great apes for research unless the testing is in the best interest of the animal or its own species.

In the United Kingdom, the Home Office announced:

*"A ban on the use of Great Apes
Great Apes... have never been used under the 1986 Act [the current
legislation] as laboratory animals...The Government will not allow their use
in future. This is a matter of morality. The cognitive and behavioural
characteristics and qualities of these animals mean it is unethical to treat
them as expendable for research."*²⁵

Although this ban is not law, the Home Office has confirmed that no license will be granted in the UK for experiments to take place using great apes. In the Home Office "News Release" accompanying the publication of the Interim Report, Lord Williams is quoted as follows:

*"Although these proposed bans cannot be statutory under current legislation,
I do not foresee any circumstances in which the Home Office would issue
licenses in such cases."*

The CHIMP Act

Towards the latter half of the 1990s, pressure to end experimentation on chimpanzees mounted within the US. research community. Many researchers felt that the high costs associated with the use of chimpanzees as research subjects, and the lack of useful results obtained from them, warranted a halt to chimpanzee HIV/AIDS research. Furthermore, the realisation of the close genetic relationship between chimpanzees and humans contributed to the rising ethical concerns regarding the use of chimpanzees in research.

The US. government first officially acknowledged a laboratory chimpanzee surplus problem in 1997, when under contract by the National Institutes of Health (NIH), the National Research Council (NRC) reported that:

²⁴ Home Office (6 November 1997): Supplementary Note to the Home Secretary's response to the Animal Procedures Committee – Interim report on the review of the operation of the Animals (Scientific Procedures) Act 1986.

²⁵ Ban enforced under New Zealand's Animal Welfare Act (142). Bill passed through Parliament by John Luxton, Minister for Food and Fibre.

“...the combination of an increase in chimpanzee numbers and less-extensive research use than was expected has created a surplus of chimpanzees and a substantial management problem”.

The NRC report, “Chimpanzees in Research: Strategies for Their Ethical Care, Management and Use”, concluded:

“if the current lack of long-range planning and coordination continues, the combination of excess captive chimpanzees in the US biomedical population and lack of facilities and resources to care for increasing numbers adequately will soon become an insurmountable problem of enormous complexity, cost, and ethical concern”.

A major factor contributing to the USA's surplus of chimpanzees was the establishment of a breeding programme in 1986. This programme was similar – but on a larger scale – to that taking place at the BPRC, at the same time. The aim of these breeding programmes was to ensure sufficient numbers of chimpanzees for research into HIV, given the global ban on trade and importation of wild chimpanzees. The chimpanzee was to have been a major tool in providing a cure; but as it turned out, the chimpanzee proved a poor model for HIV/AIDS research.

Faced with ethical objections to the continued use of chimpanzees in research, and the financial strain of caring for a surplus of chimpanzees, on 20th December 2000, the US Government introduced the Chimpanzee Health Improvement, Maintenance, and Protection (CHIMP) Act²⁶. This Act affirmed the US Government's responsibility for, and moral obligation to, ex-laboratory chimpanzees by acknowledging the need for a network of federally-funded sanctuaries providing for their long-term care and well-being.

The CHIMP Act could be perceived as an easy “solution” to the problem that the research community, particularly the NIH, has created in the United States; a solution that relieves the government of its “management problem” (i.e. financial burden). But allowing chimpanzees who have unwillingly given their lives to human medical research to live out their remaining days in a sanctuary, free of any further research, will be the end result of the CHIMP Act if it is adhered to wisely.

²⁶ Federal legislation passed in the House of Representatives – H.R. 3514: Chimpanzee Health, Improvement, Maintenance and Protection Act.

Part 2

The BPRC – its history and activities

Background

The Netherlands is a heavily regulated country and numerous committees are in place to oversee procedures relating to animals in experimental research. In particular, the regulation of institutions conducting animal tests is part of the remit of the Ministry of Health, Welfare and Sport. However, for some reason, although other institutions are thoroughly covered, the specific number and species of animals used by the BPRC, and for what purposes they were used, is not given in the Annual Report published by this Ministry.

Neither was an Annual Report produced by the BPRC for the years 1999 or 2000. The absence of such a report should be considered unacceptable in the world of publicly-funded science.

In 2000, Holland's most prominent anti-vivisection society, Proefdiervrij, lost a court battle to gain access to the minutes of the BPRC ethics committee. Although the recipient of regular grants from the Dutch government and the European Commission, no annual reports have been provided by this institution since 1998. Such opacity is not to be expected, considering that Dutch and European taxpayers contribute a significant part of the BPRC's annual budget.

History

In 1956, the TNO (Netherlands Organisation for Applied Research) founded a Radiobiological Institute in Rijswijk, The Netherlands, which incorporated a primate research facility.

In 1993, the Dutch Royal Academy of Sciences (Koninklijke Nederlandse Akademie van Wetenschappen, KNAW) produced a detailed report²⁷ in which it recommended that the primate facility should not be scaled down and that the breeding programme should be restarted. However, the Academy was unwilling to be responsible for the future operation of the primate centre. Over the years, various reports have similarly touted the importance of the laboratory, yet the economic reality demonstrates a general reluctance to back these recommendations with the hard cash that the BPRC so desperately needs.

In 1995, the TNO umbrella organisation decided to divest itself of its primate research facility, amid concern about the public opposition to the use of primates in research. In the break-up it provided £2.5 million, which was to be allocated for the improvement of animal accommodation. The institute was left to fend for itself as a private institution under the name of the Biomedical Primate Research Centre (BPRC).

²⁷ International Committee on Primate Centre TNO, KNAW (April 1993): The future of the primate centre.

In July 1998, the Dutch Ministry of Education, Culture and Sciences requested four evaluations of the BPRC, to investigate the centre on the following grounds:

- financial situation
- quality of research
- animal welfare
- social significance

The Dutch Ministry planned to use these four evaluations to decide whether to continue the annual funding of the BPRC after 1999. In the event, only the investigation into the social significance of the BPRC, carried out by the Advisory Council for Health Research (Raad voor Gezondheidsonderzoek, RGO)²⁸, was actually completed. The other evaluations ran into problems and were eventually deemed to have lost their relevance in light of the financial problems the BPRC was facing. The social significance evaluation was intended to assess the relevance of the BPRC for biomedical research in the Netherlands and for public health in particular. The RGO report concluded, as many reports have done before, that there were arguments that justify continuation of biomedical research at the BPRC, but on the other hand, that the BPRC was not indispensable.

Despite questions concerning the need for the BPRC, and the ethical and welfare concerns that the institute's existence has raised on various occasions, it appears that economics may be the sole justification on which the Dutch government has, so far, allowed the BPRC to continue. In 1993, the Royal Academy of Sciences report concluded that: "*The strongest argument to continue the activities of the Primate Centre is that closing down would be even more difficult and costly.*" Now, eight years and many millions of pounds of public money later, with ethical and welfare concerns stronger than ever, it seems that this rather simplistic and short-sighted financial argument may still be being used by Dutch government officials to keep the BPRC open.

²⁸ A summary of the RGO's publication 'Biomedical Primate Research Centre' (1998) is available on the RGO website at <http://www.xs4all.nl/~rgo>

The animals at the BPRC

The Brussels-based European Commission was responsible, in 1966, for the capture of 36 wild chimpanzees who were then brought to Holland and incarcerated within the BPRC. As a result of breeding programmes, the BPRC achieved their objective of a large population of chimpanzees; to be seen as the ‘stars’ of a European AIDS research programme in the 1980s, known as Project EVA²⁹. A special, high safety building was erected with money from the Freddie Mercury Foundation – inside, chimpanzees are used in HIV research.

Every year the Dutch Ministry of Health, Well-being and Sports inspectorate for animal experiments publishes its report “Zo doende”. This report provides information on the number of animals being used in experiments, the purpose of these experiments and the species of animals used. However, for some reason, in the case of the BPRC, no specific number of animals is given.

Further confounding the information available is the fact that the BPRC has decided to produce no further annual reports. However, basic information concerning the animals used at the BPRC follows.

In total over 1,500 primates are kept at the Biomedical Primate Research Centre. The breakdown into species is believed to approximate the following:

112	chimpanzees	(<i>Pan troglodytes</i>)
110	long-tailed macaques	(<i>Macaca fascicularis</i>)
1,000	rhesus macaques	(<i>Macaca mulatta</i>)
100	common marmosets	(<i>Callithrix jacchus</i>)
50	owl monkeys	(<i>Aotus trivirgatus</i>)
140	tamarins	(<i>Saguinus oedipus</i>)
25	squirrel monkeys	(<i>Saimiri boliviensis</i>)

The research done at the BPRC is divided into four departments:

- Immunobiology – the study of chronic inflammatory diseases and organ transplant rejection
- Virology – the study of human and primate viruses, with particular emphasis on human immunodeficiency virus (HIV) and hepatitis C virus (HCV).
- Parasitology – the study of drug and vaccine development for malaria, schistosomiasis and tuberculosis
- Animal Science – the provision of animals and veterinary support to other departments

According to the BPRC’s Director, Ronald E Bontrop, two to three hundred primates have been used in experiments at his institution over the past five years³⁰.

Two chimpanzees died at the BPRC in 2000, one from anaesthetic.

²⁹ The acronym stands for European Vaccine against AIDS.

³⁰ Metro newspaper, Netherlands, February 8th, 2001

The majority of the primates kept at the BPRC are not actually being used in any experiments. This is because babies, older animals, animals already used in experiments, and pregnant and nursing females are not used in research, and these comprise a significant percentage of the animals at the BPRC. The high number of 'redundant' animals is also attributable to the fact that the re-location of animals no longer used in research has not been viewed as a priority by either the Dutch government or the European Union.

The BPRC purchases rhesus macaques from China (Dfl 1.4 million worth in 1999, for example)³¹ because, despite a surplus of redundant animals and a breeding programme, it destroys more animals than it breeds.

³¹ Paardekoper & Hoffman Accountants, Rotterdam (16 April 1999): Audited Financial Report

Current legislation

During a visit to the BPRC on March 1st, 2001, representatives of CEECE were told by the BPRC Director, Ronald. E. Bontrop, that no significant changes in housing were planned for the next two or three years.

The European Directive (86/609/EEC) has several requirements regarding the appropriate housing, care and treatment of primates while undergoing experimentation. Various attempts by the animal protection community have been made to improve levels of protection for primates in general, but none have been specific to great apes. As it stands, the Directive is over ten years old and allows primates to be kept in totally inadequate conditions.

While the conditions at the BPRC are not in breach of these standards, they clearly illustrate how inadequate the legislation is in terms of primate psychological welfare. By their very nature primates require an environment that meets their complex social and intellectual needs. The International Primatological Society has issued guidelines³² that state that:

“... the captive environment should incorporate sufficient usable space and environmental complexity to allow primates to show a wide repertoire of behaviour appropriate for the species”.

However, much of the BPRC primate housing fails to comply even with these most modest requirements, with chimpanzees and other primates housed in small, steel cages, often in isolation.

Housing conditions

In March 1996, two UK animal welfare groups, The Royal Society for the Prevention of Cruelty to Animals (RSPCA) and Advocates for Animals published a report³³ on the conditions of the BPRC, following a visit in 1995. Video footage taken during this visit was analysed in relation to the recommendations considered essential for the psychological and physiological well-being of laboratory primates.

The RSPCA report found that in view of the special needs of primates in general – and chimpanzees in particular – the lack of environmental and social enrichment in areas of the BPRC must be considered extremely detrimental to the animals’ wellbeing. The report concludes that the welfare of many of the primates at the BPRC is seriously compromised by the conditions.

A visit to the BPRC by the UK organisation People Against Chimpanzee Experiments (PACE) in 1995, found chimpanzees housed in isolation. These animals were held in

³² International Primatological Society (1993): IPS International guidelines for the acquisition, care and breeding of nonhuman primates. *Primate Report* (special issue) **35**.

³³ RSPCA and Advocates for Animals (March 1996): Investigation of conditions for primates at the Biomedical Primate Research Centre, Rijswijk, the Netherlands. Supplement to Current standards in Europe for the care of non-human primates in laboratories.

cages measuring 5ft x 5ft x 7ft. They had no access to an outside area and no social contact with any other animal. The floors to the cages was not softened by any material but was formed by steel bars. In some cases, absolutely no enrichment was provided.

A later visit to the BPRC³⁴ confirms that little, if any, changes have been made to conditions for the primates at the BPRC.

Reports and photographs from this visit indicated that chimpanzees as young as two years old were being kept at the BPRC in “peer groups”. Such groups included three to eight infant or adolescent chimpanzees in the absence of their natural mothers. They exhibited signs of fear and distress, such as rocking from side to side and clutching to one another when moving, to form a ‘train’. Neither rocking, nor the formation of a ‘train’ are behaviours observed in free-living, wild chimpanzees³⁵.

Macaques at the BPRC are often solitarily housed in much smaller cages than the chimpanzees, often, again, without significant enrichment. On the soundtrack of video footage taken in 1995 during the RSPCA/Advocates for Animals visit, the member of the BPRC staff showing the cameraman around the institution can be clearly heard stating that the breeding macaques are kept in these isolation cages “all their lives”. They are artificially inseminated until they become pregnant. Once their infants are born, they are allowed to remain with them for nine months, after which period the infant is taken from them.

Reports from the BPRC staff indicate that the shortage of personnel, a lack of clear procedures and inadequate housing have, on occasion, made it necessary to treat chimpanzees for malnourishment. Staff have also reported that, after enjoying the few outside pens, chimpanzees show considerable reluctance to re-enter their cramped night quarters where they are hardly able to stretch. When banging the cages with sticks does not chase the animals inside, staff have been known to use the high-pressure water hose to chase the animals around the cage. An incident in which scalding hot water was used and animals were burned led to cessation of this method in 1998.

In its 1997 annual report, the BPRC announced a 20% increase in animals and a 20% reduction in animal caretakers. Such measures may be a way to cut costs, but they can only compromise the safety and welfare of both the animals and the workers at the BPRC in the long run. HIV-infected chimpanzees have managed to escape from their cages^{36,37}. BPRC personnel had to risk their own health in the recapture process.

³⁴ CEECE representatives, March 1st, 2001

³⁵ Professor Vernon Reynolds, Institute of Biological Anthropology, University of Oxford, England, and Director of the Budongo Forest Project, nr. Masindi, Uganda.

³⁶ The Mirror (17 March 1997): AIDS mad chimps go on rampage.

³⁷ De Telegraaf (March 1997): Terror as Aids chimps escape.

Scientific objections

(Please see the sections entitled ‘HIV/AIDS research on chimpanzees at the BPRC’ and ‘Hepatitis C research on chimpanzees’ for a separate analysis of this particular subject.)

CEECE investigation and analysis shows the standards of efficacy and the scientific importance of a selection of experiments performed on chimpanzees and other primates at the BPRC to be low (see Appendix II). Criticisms of such research can, in general, be divided into four areas.

Firstly, for all the experiments in Appendix II, alternatives to the use of animals as experimental subjects were available, yet the BPRC used animals. Researchers could have used one of a number of alternative methods to obtain results with more scientific merit, since non-animal alternatives provide a greater sample size. Alternative methods that are available and widely used are:

- Human volunteers
- Tissue cultures rather than whole animals
- Computer simulation techniques for assessing drug effects

Secondly, the BPRC work has duplicated studies that may well have been performed elsewhere, most notably in the USA. This indicates that the BPRC are not sufficiently aware of related work in their fields of interest. Conversely, due to no production of an annual report, it will be more difficult for other institutions to keep abreast of research carried out at the BPRC. This sort of situation is inexcusable in academic research; scientists should always consult the relevant literature before embarking on a new study. Such repetition too often occurs in science, especially where different groups are competing to make a lucrative or prestigious breakthrough. This is particularly the case where patentable pharmaceuticals are concerned. It may also occur when research groups are more focussed on acquiring research funds than on the scientific worth of the results they obtain. Where chimpanzees and other primates are concerned, this is particularly unacceptable.

Thirdly, in all the primate experiments examined, the sample size was too small to provide conclusive results. This is a severe deficiency in any kind of scientific work and would normally render such a study invalid. When too few subjects are used in a study, the results obtained are not statistically significant, and therefore reliable conclusions cannot be drawn from them. For example, if a candidate vaccine is tested on five animals and two show an improved resistance, while three show no change, the experiment teaches us nothing. Most studies using chimpanzees at the BPRC use very low sample sizes. Chimpanzees are used sparingly since using larger samples is costly and, very often, there is a lack of “suitable” animals available for experimentation.

Fourthly, much of the research at the BPRC is designed to shed light on human diseases. However, it is conducted on non-human primates. The different anatomy and physiology, different immune systems and other differences of which we remain unaware, added to the fact that the animals at the BPRC are forced to live in appalling conditions, significantly influences the outcome of experiments and means that results obtained are not valid for humans. This is despite the fact that the whole “justification” for using primates in the first place is that the results are more likely to be valid for

humans. Similarity alone is not a sufficient basis for assuming that non-human primates are appropriate models for human beings³⁸.

Furthermore, primates who are removed from their normal habitat, deprived of environmental stimulation and social interaction, often for many months or years on end, are likely to make poor models on which to record the 'natural' development of disease or infection. Like human beings, non-human primates react very differently to disease or illness depending on their physical and psychological states.

Chimpanzees, and other primates, that have been experimentally infected with any disease which is transmittable to another animal, are housed alone or with another identically infected animal. Access to the outside is not permitted and socialisation with non-infected animals is prohibited. At the BPRC, healthy young chimpanzees are used in AIDS research at ages where they would naturally remain very close to their mothers. Despite extreme ethical concerns raised by such practice, the psychological effects of such maternal privation, and the isolation imposed by viral research, are well-documented to have significant effects on the chimpanzee immune system, thereby obscuring the scientific clarity of any research carried out on the animals.

At the BPRC, many macaques are used to study the effectiveness of xenotransplantation. During the CEECE visit to the BPRC on March 1st, 2001, Director Ronald E. Bontrop told CEECE that he did not believe xenotransplantation would provide a solution to any organ shortages in medicine, yet he supported extensive research on primates, to confirm that this was indeed the case!

More reliable and cheaper alternatives are becoming available and experts and many animal advocates believe that the use of primates (chimpanzees first) will be phased out in the coming decade.

It is, perhaps, the fact that HIV research takes place at the BPRC that supports the belief in some that it is an important institution. This belief is not, indeed, supported by the facts, as presented in Appendix II of this report.

³⁸ Poor Model Man: Proceedings of PACE's conference on the use of chimpanzees in biomedical research. *ATLA* 23: 571-651. 1995.

The use of non-human primates

Most non-human primates have complex social, emotional, and family lives and display advanced levels of reasoning and behaviour. Yet, in laboratories they are often kept in conditions that would be unacceptable and illegal even in the worst of zoos. They are often caged out of touch and sometimes even out of sight and hearing of other primates. Their movement is greatly restricted, and they undergo invasive and often painful experimentation. All of this results in massive physical and emotional stress.

The central nervous system of primates and humans is organised in almost the same way, and there are endless similarities between the social behaviour, emotional needs and intellectual capabilities of humans and other primates. Their welfare, while kept in captivity is dependent on a number of important factors; housing conditions, social environment and environmental enrichment. Confinement, barren conditions, isolation and a lack of both exercise and environmental enrichment produce stress, frustration and boredom leading to severely abnormal behaviour.

Primates are favoured as experimental subjects by the research industry because of their greater genetic and physiological similarities to humans than other laboratory animals. However, this very proximity raises ethical objections to their use as laboratory animals.

In the years 1990-1994, the European Union as a whole imported 40,068 primates, mostly for research purposes, of which 29.7% are known to have been taken from the wild³⁹. Methods of trapping and handling are often cruel, holding conditions are often cramped and over-crowded and shipment is a further source of suffering, and may fail to comply with international rules established by the Convention on International Trade in Endangered Species (CITES) and the International Air Transport Association (IATA)^{40 41}. Capture of primates in the wild significantly contributes to the decline of several species, many of which are already threatened by loss of habitat.

³⁹ Eurogroup for Animal Welfare (2001): Briefing on Primates.

⁴⁰ The International Trade in Primates for Research. A report by the British Union for the Abolition of Vivisection. 1992.

⁴¹ Primates in Transit. BUAV briefing, 2000.

Financial objections

Income for the BPRC is provided by three main sources: the Dutch Ministry of Education, Culture and Sciences (OC & W); the European Union; and other institutions (charities and the pharmaceutical industry). The audited financial report for 1999⁴² gives the following figures:

	Dfl	(£) ⁴³
Total income for 1999	14,477,000	(4,187,000)
Total expense for 1999	16,247,000	(4,699,000)
Trading profit	-1,769,650	(-512,000)

The Dutch government decided in 1999 to continue its annual support of the BPRC to the tune of Dfl 4,700,000 a year. With EU funding contributing towards research projects at the BPRC on a 50% basis, European taxpayers contribute approximately Dfl 4.5 million towards experiments conducted on primates at the BPRC every year. The BPRC obtains almost Dfl 10,000,000 (almost £3,000,000) annually, from public money. An additional Dfl 4 million is contributed by the pharmaceutical industry and charities.

The BPRC has been running at an annual loss of around 2 million guilders over recent years. The audited report for 1998⁴⁴ gives an annual loss of Dfl 2,081,000 (£601,000), a slight improvement on 1997's annual loss.

The BPRC's financial problems can be sourced to a misunderstanding regarding the European Union's funding policy. In 1995, plans were made to finance the BPRC's annual budget with equal amounts of funding from the Dutch Ministry of Education, the European Union, and industry. However, these plans did not take into account the fact that the EU only makes money available on a 50% matching grant basis. That is, the EU will provide one-half of the money required to fund a project, provided the other half of the budget is supplied by the BPRC. This budgeting error has meant that the BPRC experiences an annual loss of some Dfl 2,000,000 (£600,000). **As a result, the BPRC's financial reserves have been rapidly used up in attempts to cover these losses, and the living conditions of the primates at the BPRC have suffered as a result.**

In 1999, the financial future looked extremely bleak for the BPRC. Sources within the BPRC have confirmed that towards the end of 2000, the BPRC was expected to undergo forced closure. Intervention came, at the last moment, in the shape of a local Dutch animal welfare group, the Sophia Vereeniging. The Sophia Society had started a campaign to collect tennis balls among its members to provide "enrichment" for the BPRC primates. To the amazement of the animal protection community, they then struck a deal with the Ministry which funds the BPRC (OC&W) and donated a quarter of a million Dutch guilders to BPRC. The Ministry then appropriated 15,000,000

⁴² Paardekoper & Hoffman Accountants, Rotterdam (1 May 2000): Audited Financial Report.

⁴³ Currency conversion rate of 3 February 2001 of 1 guilder = 0.28922, and £1 = 3.45752 guilders.

⁴⁴ Paardekoper & Hoffman Accountants, Rotterdam (16 April 1999): Audited Financial Report.

Dutch guilders (Dfl) (£4,338,000), in the form of a grant from the Dutch Ministry (OC &W) to the BPRC in October 2000.

It can only be assumed that the Sophia Society, as an animal welfare group, had the interests of the BPRC primates in mind, but their background is working on pet issues in Amsterdam, and, their well-intentioned actions may well have made matters worse for the primates. The Director of the BPRC has told CEECE that no improvements in the living conditions for the primates are planned for the next two or three years. Debt and losses have absorbed financial grants in the past and the existence of these two recent donations only prolongs the unnecessary suffering of the animals at the BPRC. The BPRC has shown itself to be an unviable institution and, therefore, the answer cannot be to give it more money. The answer is to give less, thus prompting responsible institutions such as the European Union and the Dutch government, and sanctuaries, into finding a long-term, not a short-term, solution.

Moreover, the Dutch Government is now using the support of the Sophia Society to justify the spending of taxpayers' money in their communications with the Dutch Parliament. By its own admission, the Ministry has assessed that, for them, closing the BPRC would be more costly than keeping it open. The allocation of government funds is clearly motivated by financial, rather than welfare, considerations.

For a financially weak the BPRC, the chimpanzees pose the biggest problem. Chimpanzees are very expensive to keep because they demand a lot more attention than the smaller macaques and live for up to 60 years. With realistic estimates by the United States National Institutes of Health (NIH) that put the daily costs of housing one chimpanzee at \$20 (equivalent to approximately Dfl50 or £14) a day, chimps are a tremendous responsibility for those who keep them. Lifetime care for one chimpanzee can cost Dfl 900,000 or £250,000 over 50 years.

The BPRC – a disgrace to the Dutch government...

The Dutch government publicly supports the notion of the ‘3 Rs’ in the use of animals for experiments – indeed, “Refinement, Reduction, Replacement” is generally accepted as a laudable goal, even among animal researchers. By its very nature the BPRC works against this principle, by deliberately attracting more research, which means the use of more animals. It is paradoxical that, whilst promoting the 3 R’s, the Dutch government is simultaneously keeping the BPRC afloat financially. In effect, many millions of Dutch guilders of public money are being provided by the Dutch government, to finance an institution whose work contradicts the government’s own policies.

...and the European Union

The European Union has a specific policy aimed at reducing the number of animals used in experimental research. In 1998, the Council of Ministers set its aim to take positive steps to reduce by 50% the number of vertebrate animals used for experimental purposes by the year 2000. Unfortunately, this good intention has not been achieved in practice.

Far from reducing the number of animals used in experimental research, European Union funds have actually helped to keep open the main facility in the EU currently using primates – the BPRC. Funding from the European Union is done on a 50/50 basis; that is, the BPRC only receives grants from the EU providing it can match the same amount from other sources. Although the EU provides over £1 million annually, the BPRC has had to scramble to find matching funding, accepting any research it can get in order to qualify for the additional EU money. Where outside funding has not been forthcoming, money has been taken from the Dutch government or from the BPRC’s own financial reserves.

ECVAM

ECVAM, the European Centre for the Validation of Alternative Methods, based in Italy, was created to validate methods of testing that would replace the use of animals. This is a slow but worthwhile process, because each validation of an alternative allows for a permanent reduction in the number of animals used in research. It is a sad irony that both ECVAM and the BPRC rely on funding from the European Union. Indeed, the two institutions are competing directly for European funds. There is no doubt that the BPRC, with its claim on EU money, is actively hindering the development of sustainable humane methods of testing.

In conclusion, the European Union funds an institution that works against the declared European aim of reducing the use of vertebrate animals in research. Much of this animal research appears to be mainly motivated by the need to receive the EU subsidy, in an attempt to alleviate the desperate financial problems the BPRC faces.

Part 3

The future – the solutions

There is an urgent need, primarily for reasons of ethics, to introduce European Union legislation prohibiting the use of great apes for research. The Netherlands must follow the UK in this respect. However, such legislation is only the beginning of the end. Chimpanzees, who can live for up to 60 years, cannot be returned to the wild after they have been kept in medical research facilities as they are not able to fend for themselves. In addition, many bear the scars of their time in research facilities; they carry the diseases, such as hepatitis and HIV, with which they were deliberately infected in the name of science.

Last year in Austria, the Immuno-Baxter company, which owned 47 chimpanzees and around 100 other primates, decided that its animals were more of a liability than an asset. They have now divested themselves of these animals and found permanent retirement facilities for them elsewhere.

The most humane option for ex-laboratory chimpanzees is to relocate them to sanctuaries. These organisations have the facilities necessary to ensure that the animals' remaining life is spent in conditions that are as naturalistic and pleasant as possible. In the United States and Canada, several private sanctuaries have already started adopting animals from laboratories and plans for new sanctuaries are underway. In Canada, the Fauna Foundation⁴⁵, Quebec, currently houses 15 former research chimps. In the US, Florida's Center for Captive Chimpanzee Care (CCCC)⁴⁶ has taken 21 of the former US Space chimps, whose alternative fate almost certainly would have been a lifetime in a research facility. The National Center for Retired Research Primates (NCRRP) in Texas houses approximately 300 primates in large natural areas.⁴⁷

In Western Europe, there are two sanctuaries and retirement homes which have taken in ex-laboratory chimpanzees. In the Netherlands, Stichting Aap in Almere,⁴⁸ has recently purchased land near Alicante, in Southern Spain, specifically to build a second sanctuary, which will be able to accommodate ex-laboratory primates, including chimpanzees, and those infected with diseases that pose a threat to human health, such as HIV-infected chimpanzees. Construction of a different sanctuary, also able and willing to care for ex-laboratory chimpanzees, has begun at Rui Dellots de la Selva, one hour north of Barcelona in Spain. Here, an extensive area of land has been donated by the local authority. The initial facilities will accommodate about 30 chimps, but there is room for expansion once financing and needs have been assessed. Monkey World, in Dorset, England, has already re-homed four young chimpanzees from the BPRC.

As well as being the most desirable option from the point of view of the animals' welfare, retirement sanctuaries make financial sense. In 1997, the US. NIH estimated that, in the US, it costs \$20 a day to keep a chimp in a laboratory. In contrast, it is

⁴⁵ The Fauna Foundation: <http://www.faunafoundation.org>

⁴⁶ The Center for Captive Chimpanzee Care: <http://www.savethechimps.org>

⁴⁷ Formerly Chimphaven: <http://www.chimphaven.org>

⁴⁸ Stichting Aap: <http://www.aap.nl>

anticipated that it will cost as little as has calculated that it would cost \$10 a day to keep a chimpanzee in a retirement sanctuary.

The BPRC itself admits, in its audited financial report of 1999,⁴⁹ that retirement of their chimpanzees in a country with a better climate would be substantially cheaper than keeping them on the Rijswijk site.

In the above-mentioned audited financial report, it is estimated that the retirement of the BPRC chimpanzees at this facility would cost Dfl 41 million. However, the report also shows that a reservation of only Dfl 8,571,109 has been made for this purpose. Apart from the fact that this is only one-fifth of the total amount required, it is uncertain how secure this provision is. Could the BPRC, if in extreme financial crisis, call back this money? In order for the chimps to be securely provided for, the Dfl 8,571,109 million must be invested in the equivalent of a pension fund.

Sanctuary facilities to accommodate all of the chimpanzees, including those infected with HIV and hepatitis, and many of the macaques at the BPRC, could be made available in Europe rapidly. Dutch government funding allocated to sustain the BPRC could be redirected to sanctuaries, as has happened in the US. European animal protection organisations would, no doubt, attempt to facilitate this process, as they have done in the US. The European Commission, which was responsible for the capture of the BPRC's original chimpanzee colony from the wild and has provided much funding of experiments at the BPRC must agree that it is unethical to continue its use of great apes for research. European Union funds could enable a centralised sanctuary to be purpose-built for the animals at the BPRC.

Adopting small numbers of surplus animals from laboratories simply makes the continuation of unnecessary animal experimentation easier and more sustainable. The history of the BPRC demonstrates a situation where animals are not provided with adequate care. Adopting animals from the BPRC, therefore, must be accompanied with the closure of the laboratory and a broader significant reduction in animal use with the long-term commitment to maintain this reduction. Existing sanctuaries could, if approached, possibly accommodate hand picked individuals from the BPRC, but, in the absence of a commitment from the Dutch government to eventual closure of the laboratory, this would leave their brothers, sisters and mothers behind, in substandard conditions for a long time – something unacceptable to the majority of European citizens.

⁴⁹ Paardekoper & Hoffman Accountants, Rotterdam (1 May 2000): Audited Financial Report.

Conclusion

1. There is now overwhelming evidence to support a European Union ban on the use of great apes for biomedical research. Chimpanzees have been shown to possess a sense of self and to anticipate the future. Research has shown that chimpanzees form strong emotional bonds with other chimpanzees and humans. They can be taught sign language and basic maths. In the wild, they form separate cultures, with different behaviour patterns transmitted within these different cultures. It is an ethical absurdity to confine them within a biomedical research facility.

The European Commission, which was responsible for the capture of the BPRC's original chimpanzee colony from the wild and has provided much funding of experiments at the BPRC must agree to cease its funding of research on great apes.

The European Union should listen to the opinions of scientists and biomedical researchers who consider the use of great apes in research to be entirely unethical. A ban should be introduced to prohibit the use of great apes in research, as in Great Britain and New Zealand.

The BPRC must not be permitted to perform research on great apes any longer and should divest itself of all its chimpanzees.

2. The Biomedical Primate Research Centre in Rijswijk, The Netherlands, should be closed as soon as possible, on welfare, ethical, scientific and financial grounds. The Dutch government cannot claim to take animal welfare seriously whilst continuing to spend taxpayer's money on keeping the BPRC open.

The vast majority of the primates at the BPRC are not used in any experiment. Nevertheless they are kept in deplorable conditions.

Over 500 macaques at the BPRC are held in solitary cages in which they cannot even stretch their bodies. A large number of surplus chimpanzees languish at the BPRC, at a high cost to the taxpaying public. Relocation of the chimpanzees at the BPRC, alone, would not guarantee that the other primates received adequate care. The track record of the BPRC does not indicate that they would and, therefore, the closure of the BPRC is essential for their welfare also.

An in-depth scientific critique of seven major research projects involving non-human primates at the BPRC is offered in Appendix II of this report.

The Ministry of Education of the Dutch government (OC&W) has been considering the implications of closure of the BPRC for some time. However, it appears unwilling to discuss this as an option at present. This Ministry should commit to the gradual reduction in its funding of the BPRC and co-operate with plans by the animal protection community to re-home the animals into retirement sanctuaries.

The European Union must embrace its existing policies of reduction in the numbers of vertebrate animals used, refinement and replacement of animal experiments and development of alternative methods. The continued funding of the BPRC is in contradiction to such policies.

3. Sanctuary facilities to accommodate all of the chimpanzees, including those infected with HIV and hepatitis, and many of the macaques at the BPRC, could be made available fairly rapidly. European Union funds could enable a centralised sanctuary to be purpose-built for the animals at the BPRC. CEECE is prepared to assist in the relocation of the BPRC primates. After years in experiments and unsuitable housing this is the least we can give to these animals. We aim to ensure that as many parties as possible work towards this aim.

Appendix I

The emotional and intellectual capacity of chimpanzees

After a discussion of the emotional capacities of chimpanzees, this report presents a dossier of summaries of key scientific papers demonstrating their intellectual capacities. Each summary in the dossier contains the reference for each paper, so the original source can be consulted if required.

Emotions

Much anecdotal evidence exists to support the notion that chimps are highly sentient beings with the capacity to live intricate emotional lives. Such anecdotes have been instrumental in changing many peoples' perceptions of chimpanzees. Even researchers using chimpanzees as experimental subjects have reset their ethical stance after witnessing first hand the obvious sentience of chimpanzees. Martin Stephens⁵⁰ gives the following example:

“The famous surgeon, Christiaan Barnard, tells of housing two chimpanzees next to each other for several months in anticipation of using them as unwitting donors of hearts for human patients. When the fateful day came and one was killed in his cage, the other wept bitterly and was inconsolable for days. “The incident made a deep impression on me,” Barnard was quoted as saying. “I vowed never again to experiment with such sensitive creatures.”⁵¹

The intense emotional bonds that chimpanzees are capable of forming amongst themselves extend to helping one another in situations of danger. These acts of aid are found not only amongst related individuals, where one might expect such behaviour to occur, but also amongst those who have no blood ties at all. Jane Goodall⁵² gives an example of such altruistic behaviour:

“Little Mel lost his mother when he was just four years old. He had no older sibling to adopt him and we all thought he would die. But then, two weeks later, and to the amazement of everyone, Mel was adopted by Spindle, a twelve-year-old, non-related male. Spindle waited for Mel during travel, and allowed the infant to ride on his back and share his bed at night. When Mel begged for food, with outstretched hand and pouted lips, Spindle shared. And when Mel got too close to socially roused adult males, Spindle risked several buffetings by rushing over to gather up his little charge and carry him to safety. There is no doubt in any of our minds that Spindle saved Mel's life.”

⁵⁰ Stephens, M.L. (1995): Chimpanzees in Laboratories: Distribution and Types of Research. In Poor Model Man – Experimenting on chimpanzees. First PACE Conference, *ATLA*, **23**:579-583.

⁵¹ Barnard, C. (1992). Quoted by Van Buren, A. (“Dear Abby”) *St Louis Post Despatch*, 28 December 1992, pp.2D.

⁵² Goodall, J. (1995): Why is it Unethical to use Chimpanzees in the Laboratory? In Poor Model Man – Experimenting on chimpanzees. First PACE Conference, *ATLA*, **23**:615-620.

Such strong emotional bonds are also found between chimpanzees and humans. Chimpanzee and human bonds are extremely durable, lasting for years, and sometimes for decades. One such example is provided by Roger Fouts in his book 'Next of Kin', who is quoted here by Adam Roberts⁵³:

“For over a decade, a chimpanzee named Booe had lived in 5'x5'x7' cages including his 1995 barren home at the New York Laboratory for Experimental Medicine and Surgery in Primates (LEMSIP). Booe was not considered an independent “chimpanzee being”; rather, he was research property - not revered for his individual qualities or features, but for his involuntary role in biomedical hepatitis experiments.

Twenty-five years earlier, in a much different type of chimpanzee research, Roger Fouts taught Booe sign language. After 16 long years apart, Dr. Fouts had an opportunity to visit his friend at LEMSIP. Surprisingly, displaying what Professor Peter Singer called “that flash of recognition that there is a thinking being there,” Booe remembered the signs he learned a quarter century ago.

He recollected the name sign for Dr. Fouts, who appeared astonished to discover that Booe had recalled who he was and the signs Dr. Fouts had taught him: “Oh my God,” exclaimed Dr. Fouts, “That's my name. That's what he's calling me.”

Jane Goodall provides another example, concerning four chimpanzees – a male called Old Man and three females. All four had been abused by humans, before their arrival at a zoo in Florida, where they were cared for by Marc Cusano. Over a period of time, Marc established a relationship with Old Man to the extent that he could feed him by hand and the pair could groom and play together. This relationship did not extend to the females, who were less friendly.

“One day Marc slipped and fell. This frightened the infant who had been born to one of the females. The mother, in defence of her child, instantly flew at Marc as he lay face down on the ground, and bit into his neck. The other two females rushed to the support of their friend. One bit Marc's wrist, the other his leg. He thought it was all up with him. He had been attacked before, but never with this ferocity.

And then Old Man charged up and intervened on behalf of his human friend. He seized each of Marc's assailants in turn and hurled them bodily away. He stayed close to Marc, keeping the highly roused, screaming females at bay, while Marc dragged himself to the boat. “Old Man saved my life, for sure”, Marc told me afterwards.”

Intellectual and cognitive capacities

⁵³ Roberts, A.R. (1996): The Human Relationship with Chimpanzees. *Animal Guardian*, 9(4):8-10.

- * **Worrying about the future**
- * **Understanding language and numbers**
- * **Self-recognition and self-awareness**
- * **Cultures**
- * **Cunning minds**

Worrying about the future⁵⁴

Animal welfare is normally restricted to concerns about the present. “Suffering” is viewed as a matter of current deprivation (e.g., of sleep, water or social interaction) or current imposition (e.g., of pain, noise or other upsetting circumstances). However, this assumes that – unlike humans – all other species live only in the present and lack the ability to imagine a specific, personal future. Byrne challenges the validity of this assumption by assessing anecdotal and experimental evidence. This evidence, while not conclusive, is most parsimoniously explained by the possession of an ability to anticipate the future held by the great apes in general, and chimpanzees in particular.

Byrne argues that signs of anticipatory planning might be shown in: deception and other manipulative social tactics; teaching; experiments in which future events need to be predicted for success; and any instance where past events could not have entirely conditioned the appropriate action. He provides a number of examples of each of these types of behaviour, which are most simply explained by the animal truly being able either to anticipate the future, or to “mind-read” others. For example:

“Frans Plooi, researching wild chimpanzees at Gombe, describes how he was able to trick an infant chimpanzee who persisted in trying to groom and climb on him. Plooi suddenly acted as if he had seen a distant object of great interest, staring fixedly into the bushes; the infant desisted from her attentions, and set off to investigate. But, when she returned, having found nothing, she ‘walked over to me, hit me over the head with her hand and ignored me for the rest of the day’. Only some sort of ‘righteous indignation’ can reasonably explain the marked change in affect, and this suggests an ability to understand that the deceit was planned”.

Byrne concludes that in almost every case, the evidence points to the great apes as having some ability to imagine future possible states of affairs; with the chimpanzee giving the most convincing signs. Animals which can predict future possibilities are

⁵⁴ **Source paper: Primate cognition: evidence for the ethical treatment of primates.**
Richard W. Byrne (1999)
In Attitudes to Animals: views in animal welfare, edited by F. Dolins. Pages 114 – 125. Cambridge University Press

mentally very much closer to humans than those that cannot. This ability must be taken into account when assessing their welfare needs; if any animal has the mental capacity to anticipate aversive events and states that have not yet happened, its capacity to suffer would be much greater. The safest course of action would be to treat them as humans. Instead of being concerned only with what happens to chimpanzees, we should also be concerned with what they might think will happen.

Understanding language and numbers⁵⁵

Rumbaugh reviews the history of research into the intellectual capacities of chimpanzees. Research of very recent years makes clear that we have profoundly underestimated the chimpanzee's intellectual abilities. Results are now sufficiently strong to justify the conclusion that chimpanzees are capable of certain operations basic to language. Just because they do not have "all of language" does not mean that they have "non of it". In particular, studies of bonobos have produced strong evidence that the bonobo can learn its symbols spontaneously, just as a human child learns its vocabulary, and it can understand specific English words produced by speech. Indeed, Kanzi the bonobo's comprehension is revealed by his ability to "translate" from English to lexigram word-symbols, without requiring special training to do so.

Research has made clear that chimpanzees and bonobos can:

- Use their symbols referentially for things not present.
- Learn symbols from other members of their species.
- Co-ordinate their own behaviour with other individuals through production and comprehension of symbols.
- Learn rules for ordering their words. Although their capacity for syntax is limited, it is nonetheless present, as exemplified by Kanzi the bonobo who uses self-generated gestures in a structured and rule-based way, in combination with learned symbols.
- Make comments and announce their intended actions.
- Their productions can be both spontaneous and original, that is, not merely imitation of others' symbol usage.

Rumbaugh gives an extensive review of the scientific literature on studies of chimpanzee numeracy abilities. Overall, the results clearly support the assertion that, whether or not they might have "true" counting skills, chimpanzees can readily perform basic summation tasks. Moreover, these summation skills were rapidly acquired, were highly accurate, and could be generalised to novel items, thereby suggesting a true understanding of the concept of number. Rumbaugh discusses the possible mechanisms of chimpanzee summation.

Rumbaugh argues that chimpanzees, as well as humans, are capable of inferring cause-and-effect relationships, and that this ability may have evolved as a means of reducing the fear and anxiety that result from the otherwise unpredictable natural world. As early as 1962, Mason anticipated that chimpanzees, and other apes as well, might be able to perceive the linkage between their behaviours, and the consequences of their behaviours. Indeed, chimpanzees in particular not only note the consequences of their behaviours, they "experiment" to see what consequences might result from alterations in their behaviours. Rumbaugh gives an illustration of cause-effect inference:

"A heavy wind storm had felled a large tree next to the colony room which housed, at that time, Sherman and Austin. When the crew came to remove the

⁵⁵ Source paper: **Current and future research on chimpanzee intellect**
Duane M. Rumbaugh (1989)
In Understanding Chimpanzees, ed by P. Heltne and L. Marquardt

tree, the animals were seemingly terrified by the sounds of power saws and trucks. (They could hear, but not see, the activities of the cutters). To identify the source of the sounds to the chimpanzees, a color video camera was placed on the scene and a monitor was stationed near the chimps. Not only was the animals' apparent terror reduced, they became transfixed with the visual correlates of sounds."

Rumbaugh argues that great apes are proficient in learning through observing things done by "socially important others". What they learn is not precisely the responses to execute so much as it is what act must be carried out for a prized goal to be achieved.

Self-recognition and self-awareness⁵⁶

In 1970, Gordon Gallup gave a number of chimpanzees individual exposure to a mirror. Many species react to their mirror images as if they were seeing not themselves, but another individual. Although this was the initial reaction of these chimpanzees, after about 3 days this response was replaced by behaviour indicative of self-recognition. The chimpanzees used the mirror to seek out otherwise inaccessible information about themselves, such as by grooming parts of the body they had never seen before.

Gallup confirmed his results using a more rigorous test of self-recognition. Using the same chimpanzees, he painted the eyebrow ridge and the top part of an ear of individuals with a bright red dye. This dye was non-irritating and odourless, and was painted on areas of the face that are invisible without the aid of a mirror. In other words, unless the chimpanzee knew that the image in the mirror was itself, it would be impossible for it to detect the presence of the red dye. Upon seeing their reflection, all the chimpanzees attempted to touch marked areas on themselves while watching the image.

With the exception of humans and these two species of great ape, all other species fail to recognise themselves, even after extended exposure to mirrors. Gallup interprets this as meaning that most other species lack an essential cognitive category – that they are missing a sense of self. The capacity to correctly infer the identity of the reflection presupposes an identity on the part of the individual making that inference – if you do not know who you are, how could you possibly know who it is you are seeing when confronted with your mirror image?

Gallup argues that the finding that chimpanzees have a concept of self has important consequences for the extension of the concepts of mind and consciousness to these species. He argues that self-awareness, consciousness and mind are not mutually exclusive cognitive categories and that the emergence of self-awareness may be equivalent to the emergence of mind. Self-awareness and mind are a product of selective pressures associated with complex social lives, and result in tactics based on cheating, grudging, deception and altruism. Gallup concludes that “chimpanzees have entered a cognitive domain which sets them apart from most other primates”.

⁵⁶ Source paper: **Self-awareness and the emergence of mind in primates**
Gordon C. Gallup Jnr (1982)
American Journal of Primatology 2:237-248

Chimpanzee cultures⁵⁷

The biological sciences define a cultural behaviour as one that is transmitted repeatedly through social or observational learning to become a population-level characteristic. Cultural differences between populations are well-established phenomena in the animal kingdom – such as dialects in song-birds and sweet-potato washing in Japanese macaques at Koshima. However, for practically all species, each instance refers to variation in only a single behavioural pattern.

Previous research into population differences amongst chimpanzees has indicated that multiple behavioural variants exist. Whiten et. al. provide a comprehensive synthesis of information on differences in the behavioural repertoires of chimpanzees, gathered as part of seven long-term field studies across Africa. This analysis reveals patterns of variation that are far more extensive than have previously been documented for any animal species except humans. 39 different behaviour patterns were found to be customary in some communities but absent in others – where ecological explanations could not be evoked. Moreover, the combined repertoire of these behavioural patterns in each chimpanzee community is itself highly distinctive, a phenomenon characteristic of human cultures but previously unrecognised in non-human species.

The results show that chimpanzees have rich behavioural complexity; a complexity that is likely to increase as further studies elaborate our understanding of chimpanzee cultures.

⁵⁷ Source paper: **Cultures in chimpanzees**
A. Whiten, J. Goodall, W. C. McGrew, T. Nishida, V. Reynolds, Y. Sugiyama,
C. E. G. Tutin, R. W. Wrangham and C. Boesch (1999)
Nature, 399:682-685

Cunning minds⁵⁸

Tactical deception occurs when an individual is able to use an “honest” act from his normal behavioural repertoire in a different context to deliberately mislead familiar individuals, to his or her advantage. Whiten and Byrne provide a synthesis of new material and old material, gathered from 115 primatologists. Analysis reveals thirteen different forms of deceptive tactic, which Whiten and Byrne have classified in terms of the function they perform. For each class, they have sketched the features of another individual’s state of mind that an individual acting with deceptive intent must be able to mentally represent.

The five classes are:

- Concealment – the agent’s behaviour functions to conceal something from the target.
- Distraction – the agent’s behaviour functions to distract the target’s attention away from A, towards B.
- Creating an image – the agent’s behaviour functions to portray the agent in a way that, rather than merely affecting the target’s attention, causes the target to misinterpret the behaviour’s significance for the target in other ways.
- Manipulation of target individual using social tool – the agent’s behaviour functions to manipulate a third party (the tool) so as to affect the target, to the agent’s benefit. The tool plays an active part (though not necessarily consciously).
- Deflection of target individual to fall guy – the agent’s behaviour functions to divert the target posing the problem towards a third party (the fall guy). The fall guy plays a passive role.

Whiten and Byrne provide a detailed discussion, with examples, of each class of deception.

Analysis of the data reveals that chimpanzees alone are cited for nine of the thirteen classes of deception, compared with only two for gorillas. As well as deception, there are also examples of counter-deception. For example, Plooij reports:

“One chimp was alone in the feeding area and was going to be fed bananas. A metal box was opened from a distance. Just at the moment when the box was opened, another chimp approached at the border of the clearing. The first chimp quickly closed the metal box and walked away several metres, sat down and looked around as if nothing had happened. The second chimp left the feeding area again, but as soon as he was out of sight, he hid behind a tree and peered at the individual in the feeding area. As soon as that individual approached and opened the metal box again, the hiding individual approached, replaced the other and ate the bananas.”

⁵⁸ Source paper: **Tactical deception in primates**
A. Whiten and R. W. Byrne (1988)
Behavioral and Brain Sciences, 11:233-273

Appendix II

Primate experiments at the Biomedical Primate Research Centre, Rijswijk, the Netherlands

A. Chimpanzee experiments

Much of the chimpanzee research at the BPRC aims to understand why chimpanzees, although vulnerable to infection by HIV, do not develop AIDS. The BPRC scientists suppose that if they find out why chimpanzees are resistant to AIDS, they may be able to prevent HIV-infected people from developing the illness.

The BPRC is therefore conducting experiments into the reactions of chimpanzees' vital defences, usually by studying tissue biopsies or blood samples in the test tube. Because chimpanzees do not normally become ill from HIV infection, experiments tend not to be terminal. Consequently, individual chimpanzees spend many years at the BPRC undergoing infection, periodic injections, blood sampling or biopsies.

A1. Chimpanzees: lymph nodes and HIV resistance

AIDS Research and Human Retroviruses 15:365-373.

Experiment conducted at Department of Virology, the BPRC; together with scientists from Onze Lieve Vrouwe Gasthuis, Amsterdam; and the Academic Medical Centre, University of Amsterdam.

Funded by two grants from the European Community Centralised Facility for pre-clinical vaccine development, and by the EU Biomed Project.

Background

People who become ill with AIDS have damaged lymph nodes which are not seen in long-term survivors with HIV (who have not developed AIDS). Detailed studies of lymph nodes in both groups of HIV-positive people were conducted in the mid-1990s⁵⁹.

In this experiment scientists studied the lymph nodes from virus-infected chimpanzees to see if there were similarities with the human findings.

⁵⁹ Tenner-Racz, K (1 993). American Journal of Pathology 142:1750-1758. Pantaleo, G et al (1 995). New England Journal of Medicine 332:209-216. Koopman, G et al. (1 997). AIDS Research and Human Retroviruses 13:227-233.

The experiment and a critique

Fourteen chimpanzees were used, the oldest having been born in 1961 and the youngest in 1991. Nine had been infected with HIV, three with a different virus and three were uninfected. During the mid-1990s, lymph node biopsies had been taken from all the chimpanzees and stored frozen. This experiment is based on test-tube analyses of those stored chimpanzee tissue biopsies, which were compared with lymph nodes from HIV-positive humans who had died.

The findings for infected but well chimpanzees and humans who had developed AIDS, varied in several ways:

* Chimpanzees had low numbers of HIV-producing cells in their lymph nodes and no virus 'trapping' in the centre of the lymph nodes. The human lymph nodes had many cells producing HIV and the virus was found in the centres of the nodes.

* *The lymph nodes from most chimpanzees were undamaged, whereas in humans there was considerable damage.*

* In chimpanzee lymph nodes there were large numbers of white blood cells, but not the type which can destroy HIV-infected cells. In human nodes the opposite was true.

Because two species and several virus strains were being compared, the significance of the results for humans with HIV is not clear. Even when infected but well chimpanzees are compared with similar-status humans, there are still some differences in lymph node findings.

Suffering

It seems that most or all of the lymph node biopsies had been taken by needle from the chimpanzees some time previously. The biopsies would have been taken while the chimpanzees were anaesthetised or sedated.

The chimpanzees were infected with various viruses but were not ill as a result. The experimental suffering was relatively minor, but some of the chimpanzees were more than 30 years old. As their birth dates are provided, it is likely that they have been kept in solitary confinement, or with just one other chimps, and with no access to an outside area, for up to three decades or more. This is a life sentence which no human criminal would have to endure.

Alternatives

The purpose of the study was to find out how virally-infected chimpanzee lymph nodes differ from HIV-infected human ones. Because chimpanzees are infected by HIV but do not develop AIDS, researchers hope to discover what protects them.

However, similar studies have already been done in humans. Long-term survivors of HIV infection have been compared with people who have developed AIDS, and

differences were found in their lymph nodes⁶⁰. Results from human studies are free of the complications of species differences, although they may be more difficult to carry out.

Additionally, scientists have developed a tissue culture system for human lymph nodes (tonsils) which permits experiments to be conducted in the test tube. These researchers, based at the National Institutes of Health, USA, stated⁶¹:

“Animal models do not fully mimic the characteristic tissue pathology of human HIV infection. For this reason, we have developed a tissue culture method that retains the complex three-dimensional spatial cellular organization found in normal human lymphoid tissue.”

A combination of human studies and tissue culture could be used to replace these chimpanzee experiments. However, the BPRC scientists want to develop the chimpanzee 'model' so that they can continue their experiments with greater ease in the laboratory.

A2. Chimpanzees: genes, white blood cells and HIV resistance

Journal of Immunology 162:2308-2314.

Experiment conducted at the Departments of Virology and Immunobiology, BPRC.

Funded by a European Community grant.

Background

Long-term human survivors of HIV-1 infection tend to have certain genes which help their white blood cells⁶² combat the virus. Like humans, only a small proportion of chimpanzees fight the virus by this means. The white blood cells recognise HIV-infected cells in the circulation and attack them.

This experiment aimed to find out more about white cell activity in chimpanzees, to see if it is the same as has been found in human survivors. Scientists hope eventually to find drugs or vaccines which will prolong resistance.

The experiment and a critique

The research involved 13 chimpanzees. 10 had been infected with HIV-1 (six of them as long ago as 1990), but only two had white blood cell activity against HIV. Three non-infected chimpanzees were also included.

⁶⁰ Pantaleo, G et al (1995). New England Journal of Medicine 332:209-216.

⁶¹ Glushakova, S et al (1995). Nature medicine 1:1 320

⁶² " These white blood cells are called cytotoxic T- lymphocytes.

The experiment involved studying white blood cell activity in the test tube, using blood samples taken from the chimpanzees. It was found that each of the 13 chimpanzees had a different range of white blood cell types. In the two chimpanzees whose white cells were active against HIV, the experiment showed how the cells recognise HIV infection and which genes are involved.

The two infected chimpanzees with active white blood cells each had a different gene for recognising HIV; but neither of the genes was the same as the genes which perform the same function⁶³ in long-term human survivors.

So despite the fact that we share more than 98% of our genes with them, results from chimpanzees cannot be considered reliable for understanding human HIV infection.

Suffering

The chimpanzees infected with HIV-1 did not have symptoms of AIDS, and this research only required the taking of blood samples. However, six of the ten infected animals had been at the BPRC for at least 10 years (and maybe longer). They may have been in solitary confinement without environmental enrichment for most of that time - an appallingly cruel fate.

Alternatives

This experiment could have been carried out entirely using human volunteers. Indeed, most of the results have already been discovered in humans.

The real point of the study seems to have been to find out whether chimpanzees would be suitable 'models' for human long-term survivors of HIV infection.

Such a chimpanzee 'model' would permit direct experimentation over a shorter time scale than careful studies of human patients. However, chimpanzee results will never be completely reliable, and may mislead researchers about the human situation.

A major contribution to understanding immune reactions to HIV has been made by studying them in the test tube using human cells. Combining these approaches with human volunteer studies offers a scientifically credible and ethically acceptable means of researching HIV.

⁶³ In humans, genes HLA-B*27 and HLA-B*57 are associated with long-term survival after HIV infection. The chimpanzee genes found in this study were Patr-B*02 and Patr-B*03, which are not similar to the human genes and yet seem to perform the same function.

A3. Chimpanzees: shared genes and HIV resistance

Immunology Letters 66:61-67.

Experiment conducted at the Departments of Virology and Immunology, BPRC.

Funded by the European Community Centralised Facility (ECCF) for Preclinical HIV-vaccine development and by a European Community grant.

Background

Some long-term human survivors of HIV-1 infection have certain genes which help their white blood cells⁶⁴ combat the virus. Like humans, some but not all chimpanzees fight the virus by means of white blood cell activity, which varies between individuals.

This experiment was a follow-up of experiment A2 above. It aimed to find out whether white cell activity against a protein from the HIV virus is the same in individuals who are genetically similar.

The experiment and a critique

Three chimpanzees were used. Two were sisters (aged 14 and 15 years) and a third, unrelated, was a control animal (aged 16). None were HIV- infected.

The two sisters were injected into the muscles, four times over a 44-week period, with a protein from HIV⁶⁵. This does not infect them but stimulates the immune system (the same protein is a candidate HIV vaccine). The control chimpanzee was immunised with a different protein, for comparison. Blood samples were taken to analyse white cell activity in the test tube.

Only one of the sisters developed a white cell response to the HIV protein. The scientists considered that several genetic differences between the sisters might account for this; or that in their past they had experienced different viral exposures which affected their reaction.

This study did not provide the answers expected, but merely led to a range of additional questions which could be studied in future experiments. The BPRC scientists stated that the chimpanzee sisters' different responses 'may be important in our future understanding of how certain individuals respond differently to viral infections and vaccines". As well as individual variations, there will also be species differences - which will cause further complications in the future.

⁶⁴ These white blood cells are called cytotoxic T- lymphocytes.

⁶⁵ The protein was made synthetically and is called rgp1 20

Suffering

Experimental manipulations included four muscle injections and blood sampling. The report gave no details of the chimpanzees' care and accommodation. However they will possibly have endured several years of solitary confinement in cages without environmental enrichment.

Alternatives

This experiment could have been conducted with healthy human volunteers. The HrV protein used has been tested as a candidate vaccine in literally thousands of people over several years. It is now in advanced clinical trials and is known to be safe.

As long ago as 1995, the protein was injected into several hundred healthy volunteers and was found to induce white blood cell activity in them⁶⁶. A small clinical study comparing the responses of brothers or sisters injected with the protein would have been ethically acceptable and practical.

However, the BPRC wants to do its research in chimpanzees and to establish itself as the centre of expertise for primate research throughout Europe. Each experiment on primates is conducted with further experiments in mind. This self-perpetuating culture should be challenged, not only for the sake of primates at the BPRC but because results from human studies are much more relevant and reliable than experiments on other species.

B. Experiments on other primates

Other species of primates used at the BPRC include marmosets and rhesus monkeys. They are used in research into multiple sclerosis, AIDS, organ rejection, arthritis and malaria.

B1. Rhesus monkeys and HIV virulence

Journal of General Virology 80:3089-3097.

Experiment conducted at Department of Virology, BPRC; together with scientists from the Academic Medical Centre, Amsterdam and Tulane University, USA.

Funded by the Dutch Public Health Organization (RGO) and the European Community Centralised Facility for AIDS research.

⁶⁶ Dolin, R (1995). Journal of Infectious Diseases 172:1175-1183.

Background

There are many different strains of the human AIDS virus, HIV. The strains vary in their virulence, which is their ability to infect, multiply and cause disease. The features which account for increased virulence - and hence more rapid development of disease - are not known.

This experiment used rhesus monkeys infected with a related but different virus, simian immunodeficiency virus (SIV), to study virulence.

The experiment and a critique

Twenty-four young male rhesus monkeys were used in this experiment. Firstly, 10 animals were infected with a single strain of SIV. The time to death from AIDS ranged from seven months to more than three years. Nine of the monkeys endured severe AIDS symptoms (see **Suffering**, below) and died or were killed.

Blood was taken from the monkey who most quickly developed AIDS, and injected into a healthy monkey who developed AIDS within four months. This process was repeated until 16 monkeys had been sequentially infected and become ill. This sequential infection process through different animals is called 'passaging' the virus.

The virus was most virulent after the fourth passage (causing AIDS within one month), and so an additional eight monkeys were infected with it at that stage. The results suggest that the monkey virus SIV had become more and more virulent when it was 'passaged' through a number of monkeys by sequentially infecting them.

The researchers think this may be relevant for people who are infected with a virulent strain of HIV, and who consequently may develop AIDS more rapidly themselves.

There are many scientific criticisms:

- The immune systems of rhesus monkeys are similar but not identical to those of humans.
- The monkeys were infected with SIV (because they are not susceptible to HIV). SIV is related but is not the same virus. For example, SIV uses different ways of entering cells than does HIV.
- The monkeys were all of a similar age and background. When the researchers repeated their experiment in monkeys of different age groups and even of different geographical origins, the results were not the same. No one knows which, if any, of these monkeys would most resemble human patients of different age groups, lifestyles, genders and geographical origins.
- Viral infection and disease development are affected by features of the infected individual, the virulence of the virus and environmental factors. Interactions between these will not be the same in humans as in monkeys artificially infected with a different virus.

For these reasons the reliability and relevance of the research cannot be validated.

Suffering

This experiment caused severe and prolonged suffering. Rhesus monkeys were infected with SIV and developed advanced symptoms of AIDS. Some died from the disease, and others were killed when near death. Some experienced AIDS symptoms for several months before they died.

The range of symptoms included:

Meningitis * pneumonia * diarrhoea * wasting * kidney disease * thrush * abscesses in the lungs* cytomegalovirus infection * giardia infection * bile duct inflammation * brain inflammation.

Alternatives

Just before this paper appeared in 1999, an American research group published similar work using cynomolgus monkeys⁶⁷. Although the specific aims were slightly different, there was considerable duplication. At the same time, another AIDS researcher stated that “Researchers familiar with SIV infection of macaques have long known that animal to animal passage of a fairly weak virus results in a ‘heating-up’ phenomenon, such that the virus eventually induces AIDS quite rapidly”⁶⁸.

Moreover, early in 1999 a report was published showing that 10 different types of HIV had different rates of progression to AIDS in infected women⁶⁹. **The present study caused severe pain and distress to monkeys, but did not add new or important information.**

B2. Rhesus monkeys and dose of HIV

Journal of General Virology 81:1719-1726.

Experiment conducted at Department of Virology, BPRC.

Funded partly by European Community grants.

Background

Several factors may affect how quickly someone infected with HIV becomes ill with AIDS. One of these factors may be the dose of virus which first infects a person.

⁶⁷ Kimata, JT et al (1 999). Nature Medicine 5:535-541.

⁶⁸ Hirsch, VM (1999). Nature Medicine 5:488-489.

⁶⁹ Kanki, PJ et al (1 999). Journal of Infectious Diseases 179:68-73.

This research is a follow-up to experiment B1 above. Using rhesus monkeys infected with the SIV virus, the aim of this experiment was to link the original infecting virus dose with levels of virus later found in the bloodstream, and the speed at which monkeys developed AIDS.

The experiment and a critique

There were two parts to the experiment. Firstly, 10 rhesus monkeys were injected with different doses of a highly virulent strain of SIV (developed in experiment B1). SIV is a virus related to HIV, but it is not identical. The monkeys were monitored for the development of AIDS; and regular blood samples were taken to measure levels of the virus and levels of antibodies. Six monkeys were killed when they developed obvious symptoms of AIDS.

The second aspect involved reviewing existing information from 39 rhesus monkeys who had also been injected with the same strain of virus, at varying doses, in the past.

The combined results suggested that an adequate dose of virus is first necessary to establish infection. Above that level there was no connection between increasing virus dose and the rate at which disease developed.

This experiment caused six monkeys to suffer AIDS symptoms but cannot be justified scientifically, for the following reasons:

- The immune systems of rhesus monkeys are similar but not identical to those of humans.
- The monkeys were infected with SIV which is related to HIV but is not the same virus.
- The existing information from 39 previously infected and studied monkeys would have provided the same answers, without deliberately infecting 10 additional animals.
- The rate of AIDS progression in humans has already been linked to levels of the virus in the bloodstream. The original virus dose at infection, as measured in monkeys in this study, is not a helpful parameter for human patients.

Suffering

Six monkeys were killed when they developed AIDS. Their symptoms included one or more of the following: 10% weight loss, persistent diarrhoea, abnormalities of the brain or nervous system, thrush, herpes, and anaemia.

Alternatives

The experiment produced little significant information, all of which was in any case available from the BPRC's existing data from previously infected monkeys.

It would be difficult to discover in humans the size of the original dose of HIV which infected them, although some information may be available from patients infected via blood transfusions. However, other early pointers towards how quickly a patient may develop AIDS after infection have been known from human studies for many years. For example, early symptoms experienced when first infected; levels of the virus in the bloodstream known as 'viral load'; and levels of certain white blood cells, predict how quickly a patient will develop AIDS.

B3. Rhesus monkeys and malaria research

Experimental Parasitology 93:58-60.

Experiment conducted at Department of Parasitology, BPRC.

Funded by the European Commission.

Background

An important parasite responsible for human malaria, *P. vivax*, is becoming drug resistant, so researchers are seeking new drugs and vaccines.

Until 1997 it had not been possible to grow this parasite in the test tube, and chimpanzees and rhesus monkeys are not susceptible to this human parasite. Thus it had been difficult to obtain enough *P. vivax* parasites to use in genetic studies.

Faced with these difficulties, the BPRC turned to a primate 'model' of the human infection, by studying a related but different malaria parasite called *P. cynomolgi* which infects rhesus monkeys.

The aim of the experiment was to grow parasites in monkeys, and then establish whether the parasite's genes could be modified.

The experiment and a critique

Two rhesus monkeys were used. The first was injected with *P. cynomolgi* parasites and after 11 days the parasites had multiplied in the monkey's bloodstream. **Blood was then taken by inserting a needle into the heart of the monkey (cardiac puncture).**

The malaria parasites were then genetically modified and injected into a second rhesus monkey for further study, and again to increase the stocks of the parasite. Thus the monkeys were being used as living test tubes – convenient systems in which to multiply and produce stocks of malaria parasites for research.

The experiment showed that *P. cynomolgi* parasites can be genetically modified, enabling further studies of gene function - but also requiring the use of more rhesus monkeys.

The researchers justify their use of a non-human malaria parasite and a nonhuman species as 'models' for the human situation by emphasising the similarities between the two types of malaria parasites. However, the two parasites are not identical, and drugs or vaccines developed in rhesus monkeys may not work in humans.

Suffering

No information was provided about the source, age or gender of the rhesus monkeys used, about their accommodation or their clinical symptoms. The monkey injected with malaria parasites probably experienced symptoms such as fever, chills, headache, nausea and muscle ache.

The paper does not make clear whether the monkey who underwent cardiac puncture was subsequently killed or re-used. The animal would have been sedated or anaesthetised during the process.

Alternatives

Until 1997 it had proved impossible to grow the human malaria parasite, *P. vivax*, in culture. **In that year American scientists had success culturing the parasites in human blood cells in the test tube, but their method was labour intensive⁷⁰. The scientists believed their culture method opened new opportunities to develop vaccines and drugs against human malaria.**

Unfortunately, the BPRC preferred a more convenient approach which, instead, used sensitive and intelligent primates as living test tubes.

⁷⁰ Golenda, CF et al (1 997). Proc. Nati. Acad. Sci. 94:6786-6791.

Appendix III

Collaborating institutions

Information presented below has been extracted from CORDIS⁷¹, the European Union's database of the experiments it funds. This database does not provide detailed information, but only abstracts of research carried out. Detailed information is not made available to the public, for, according to the European Commission, "legal reasons"⁷² - a matter of concern given the fact that funding for these projects is solely comprised of public money.

For the purposes of this report information relating to British and Dutch institutions has been specifically collected from this database, but, where primate research projects are taking place, led by researchers in other EU member states, these may have been noted also. A table of research departments or institutions involved in EU funded, non-human primate research at the BPRC within the past three years, appears below. **The names of individual researchers has been deliberately withheld for reasons of security.** Recently completed projects are listed along with those currently taking place. Many projects involving primates have not been listed – here we provide only a selection. Where information is available, the primate species used is listed. Unfortunately, occasionally researchers using primates do not refer in their literature to the species they use.

Of the six projects using chimpanzees at the BPRC over the past two years, registered in this database, four involved scientists at English institutions⁷³. In two cases, UK researchers have taken the role of "prime contractor". Yet the UK Home Office has legally prohibited the use of chimpanzees in research on ethical grounds.

The other two chimpanzee-based projects are led by the leading French research institutions.

Of the 25 EU funded research projects listed in CORDIS, involving primates at the BPRC over the past three years, 14 (more than half) have involved researchers at UK institutions.

⁷¹ <http://dbs.cordis.lu/> ©European Communities, 2000

⁷² Quoted from a letter dated 13th March, 2001, from the European Commission's Research Directorate-General, Directorate F – Life Sciences; health research .

⁷³ Three additional research projects involving chimpanzees at BPRC, not listed on the CORDIS database, are described in detail in Appendix II of this report.

Researcher/institution	Primate species used	Type of research	Date completed
<p>Chelsea & Westminster Hospital, Department of Immunology, ICSM, London, UK (Prime contractor)</p> <p><i>with</i></p> <p>St George's Hospital Medical School, Division of Oncology, London, UK</p> <p><i>and</i></p> <p>Imperial College School of Science, Technology and Medicine, Department of Genito-Urinary Medicine & Communicable Diseases, London, UK</p>	Chimpanzees	HIV	31.3.2000
<p>University of Leiden, NL.</p> <p><i>With</i></p> <p>The Chancellor, Masters and Scholars of the University of Oxford</p>	Chimpanzees, rhesus macaques	Hepatitis C	2.8.2003
<p>Albert-Ludwigs-Universitat, Freiburg, Germany</p> <p><i>with</i></p> <p>Imperial College, Department of Genito-Urinary Medicine and Communicable Diseases, London, UK</p> <p>(Additional funding received from The Jefferiss Research Trust).</p>	Chimpanzees	Foamy virus for somatic gene therapy (in HIV)	31.10.2000

Department of Biology, Schistosomiasis unit, University of York, York, UK (Prime Contractor), with Rijksuniversiteit Leiden, NL	Chimpanzees	Schistosomiasis	30.6.2000
Institute Pasteur, Paris, France	Chimpanzees	MPES	30.4.1999
Institut National de la Sante et de la Recherche Medicale, France	Chimpanzees	Hepatitis C	31.12.2000
Imperial College, London	Not given	Malaria	30.6.1998
Rijksuniversiteit Leiden (Prime Contractor)	Not given	Malaria	31.12.1998
United Medical and Dental Schools of Guy's and St. Thomas' Hospitals, Department of Immunology, London, UK	Rhesus macaques	HIV	30.6.2000
Centre National de la Recherche Scientifique, France	Rhesus macaques, aotus monkeys, saimiri monkeys	Malaria	31.7.2000
United Medical and Dental Schools of Guy's and St. Thomas' Hospitals, Department of Immunology, London, UK	Rhesus macaques	HIV	31.8.2001
Nederlandse Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek	Marmoset monkeys	Multiple sclerosis	31.10.2000
Universitat Regensburg	Rhesus macaques	HIV	31.10.2000
Institute Pasteur, France	Not given	MPES	31.5.2000

Universiteit Netherlands	Leiden,	Not given	Malaria	2.2.2003
Deutsches Primatenzentrum, Germany		Macaques	HIV	25.1.2003
Centre National de la Recherche Scientifique, France, with (not prime contractors): King's College, London; Medical Research Council, UK; Imperial College, London et. al		Not given	“European Vaccine Effort Against HIV/AIDS”	31.12.2002
Katholieke Universiteit Nijmegen, with (not prime contractors): University of Oxford; University of Aberdeen; University of Glasgow; Imperial College, London; London School of Hygiene and Tropical Medicine.		Not given	Malaria	3.2.2003
University of Edinburgh, Scotland, UK		Aotus monkeys	Malaria	27.1.2003
Institute Pasteur, France, with :Medical Research Council, UK; Ministry of Agriculture, Fisheries and Food, UK; University of Surrey, U.K; SmithKline Beecham Biologicals S.A.; Imperial College, London, UK, et al		Not given	Tuberculosis	18.1.2003

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