

Monkeying Around With Human Health

the cost to people of experiments on primates

'It is time the public knew that using monkeys is archaic and dangerous to human health. The abandonment of animal models is absolutely vital for medicine to advance.'

Ray Greek MD,
Medical
Director of
Europeans For
Medical
Advancement



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'I have yet to hear a sufficiently compelling scientific argument that justifies the suffering inflicted on primates in medical research.'

- Dr. Charlotte Uhlenbroek, leading primatologist and BBC science presenter.

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Introduction

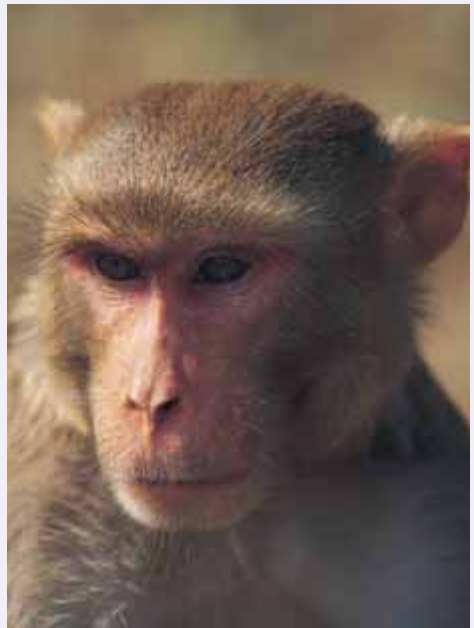
In 2002, 3977 experiments using 3173 monkeys were conducted in the UK alone.¹

The majority were subjected to product 'safety testing' carried out by pharmaceutical companies or their contract research organisations. The remainder were used in experiments to study the brain, disorders such as Alzheimer's and Parkinson's and other physiological functions.

In an attempt to explore how the human brain works and develop potential remedies for a range of neurological conditions, monkeys have their skulls opened and their brains damaged with toxic chemicals and through surgery. They are then often set a battery of tests in experiments that can last months, and even years. Most experiments end with the monkeys being killed and various body parts analysed. But prior to death, according to the researchers' own published papers, the animals suffer symptoms that include seizures, vomiting, diarrhoea, tremors and uncontrollable body movements.

The public is strongly opposed to the use of primates in laboratories (see box opposite) for a number of compelling reasons that cannot be dismissed as mere sentimentality. Many dispute the claim that research on primates is necessary for medical progress and believe that the reverse is true. As the following pages will show, primates are a poor model for such research and their use has resulted in harm to patients, which is an inevitable consequence of reliance on other species to study human diseases.

Our close kinship with primates is undeniable and the more we learn about them, the more it becomes apparent that they share with us emotions, intelligence and complex social relationships. They are clearly capable of suffering psychologically as well as physically when separated from their family groups, confined in a cage, denied freedom to express their natural behaviour and subjected to painful and invasive procedures. All these fates await primates used in laboratory experiments.



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The public says 'No!'

A NOP poll commissioned by Animal Aid in April 2003 found that 52% of respondents regarded experiments on primates as morally unacceptable. Only 40% said they were acceptable – the remainder fell into the 'don't know' category. When asked whether they believed that results from primate experiments could be reliably applied to people, 43% said they could not, whilst 44% said they could. Amongst the younger age groups, a clear majority regarded such tests as scientifically unreliable.

This government came to power promising to reduce animal experimentation. Yet since 2000, the British Union for the Abolition of Vivisection (BUAV) has revealed, they have been secretly planning a new macaque breeding centre - to be funded by the taxpayer - at the military research centre at Porton Down in Wiltshire.² This will inevitably increase the use of macaques in British laboratories by avoiding the current difficulty and delay in procuring monkeys from abroad.

The government also gave the go-ahead for Cambridge University to build a massive new primate research centre, which would have housed hundreds of monkeys for use in brain experiments. This was despite the fact that, at a public inquiry ordered by John Prescott, and at which Animal Aid gave detailed scientific evidence demonstrating that the Centre would produce no benefits for human medicine, the presiding Inspector concluded that the University had failed to prove its central claim that there was a 'national need' for the laboratory. Shortly after receiving planning permission, the university announced it was pulling out of the project for 'financial reasons'.

In 2002, MEPs voted in favour of a complete review of the use of all primates in experiments. They singled out Britain and Cambridge University, in particular, for inadequate enforcement of existing regulations. The next development will be the publication of the European Commission's long-awaited proposal for a revision of Directive 86/609 (which determines how member states of the EU regulate the use of animals in experiments), which will present MEPs with the opportunity to vote for an outright ban. In 2003, an Early Day Motion calling for a complete ban on all primate experiments, on the grounds that they were scientifically insupportable as well as causing extreme suffering, was signed by no fewer than 131 MPs.

The following pages will assess the three main types of primate experimentation, on the basis of their scientific value - a key factor in any attempt to justify such a controversial and distressing practice. The three main research categories are drug testing; brain function and disorders; and the study of infectious diseases.

Drug testing

Using primates damages and kills people

Primates have failed researchers with regard to their ability to predict dangerous side effects of medications. For example:

- Hormone replacement therapy - given to millions of women following research in monkeys - has recently been found to *increase* their risk of heart disease, stroke and breast cancer.³
- Isoprenaline doses (for asthma) were worked out on animals, but proved too high for humans. Thousands of people died as a result. In subsequent tests, even when the researchers knew what to look for, they were unable to reproduce this effect in monkeys.⁴
- Carbenoxalone (a gastric ulcer treatment) caused people to retain water to the point of heart failure. Scientists retrospectively tested it on monkeys, but could not reproduce this effect.⁵
- Flosint (an arthritis drug) was tested on monkeys - they tolerated the medication well. In humans, however, it caused deaths.⁶
- Amrinone (for heart failure) was tested on numerous nonhuman primates and released with confidence. People haemorrhaged, as the drug prevented normal blood clotting. This side effect occurred in a startling 20% of patients taking the medication on a long-term basis.⁷
- Arthritis drug Opren is known to have killed 61 people. Over 3,500 cases of severe reactions have been documented. Opren was tested on monkeys without problems.⁸
- Aspirin causes birth defects in monkeys but not in humans.⁹

'It is the actual results of teratogenicity [birth defect] testing in primates which have been most disappointing. Of the 15 listed putative human teratogens tested in non-human primates, only eight were also teratogenic in one or more of the various species...'
- Dr. JL Schardein, author of 'Chemically Induced Birth Defects'.

Despite these failures, marmosets, in particular, are increasingly popular as the 'second species' – in addition to rodents - required by regulators responsible for licensing new drugs. They are attractive to pharmaceutical companies because they are small and easy to breed in captivity. Their size makes them cheaper than dogs to dose with expensive test compounds and easy to house in small cages and inhalation chambers.

These benefits are itemised in a paper published by the Association of the British Pharmaceutical Industry in 2001.¹⁰ The paper notes, however, that marmosets are very



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excitable and can be difficult to handle. Their small size (and therefore blood volume) can be a problem when multiple blood samples are required. Skilled and experienced technicians are needed to dose marmosets intravenously, to take blood from their femoral (thigh) artery, or to dose them by 'gavage' - a long tube pushed down the throat to the stomach. Marmosets cannot be trained to tolerate these procedures and must be restrained and even sedated.

Stolen from the wild

Not only do monkeys endure the trials of laboratory life, many are imported from such distant countries as Mauritius, Israel, Indonesia, the Philippines and China. 53% of procedures in 2001 involved animals imported from such sources outside the EU. Investigations by the British Union for the Abolition of Vivisection (*Paradise Lost*, available at www.buav.org) and by the RSPCA (*Counting the Cost*: available at www.rspca.org.uk) reveal appalling conditions at some breeding centres, which are often founded, re-stocked and augmented with animals trapped from the wild. Capture from the wild causes huge distress. The first-generation offspring are sold to UK laboratories, having been taken from their mothers as young as six months old. Their journeys to the UK are in tiny, cramped crates and can last as long as three days - some monkeys have died in transit.

Species under threat

Concern about the use of macaques, in particular, is heightened by their conservation status. Long-tailed (also known as crab-eating or cynomolgus) macaques and rhesus macaques are the most commonly used species. They are 'old world' monkeys, native to Asia, where they live in large social troops that sometimes number 100 individuals. They are very communicative and maintain close relationships through mutual grooming. The long-tailed macaque is listed as near-threatened on the 2000 International Union for the Conservation of Nature 'red list'. The Japanese macaque is listed as endangered; yet up to 2,000 are captured and sold to Japanese laboratories every year. China is the main source of rhesus monkeys for Britain but housing conditions there are particularly horrifying. Breeding stock is taken from wild populations, which are in serious decline.

'Drawing from the wild poses an additional threat to the conservation status and, ultimately, survival, of some species and local populations.' Counting the Cost, report by the RSPCA (See p 7.)

Monkey data is rubber-stamped

UK law states that the use of primates is permissible only if the researchers can demonstrate that no 'lower' species could be used instead. Yet regulators (the Medical Healthcare Products Regulatory Authority in the UK) accept marmoset toxicity data without query. This further encourages their use purely in order to gain easy official approval.



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A fundamental point is that the use of primates – or indeed any animal species – for medical research has never been properly scientifically evaluated to see if their use produces benefits for human medicine. This was confirmed when Portsmouth South MP, Mike Hancock – on March 31 2004 - asked an apparently innocuous parliamentary question of the Home Secretary. 'What recent research', Hancock wanted to know, had his Department 'commissioned and evaluated on the efficacy of animal experiments?'

The answer was unequivocal. 'The Home Office has not commissioned or evaluated any formal research on the efficacy of animal experiments.' In the language of tabloid newspapers, this admission was a 'bombshell'. Here was the government department in charge of regulating vivisection admitting that it had – neither recently, nor at any other time – bothered to assess in a systematic way whether experimenting on animals produced beneficial results for people. The starkness of the admission was made all the more glaring by the 'cut and paste' paragraphs that followed it in the formal written answer to Hancock. 'Animal experiments must be judged to be potentially efficacious in order to be licensed under the Animals (Scientific Procedures) Act 1986, which requires that animals may only be used in scientific procedures where such use is fully justified, where the likely benefits outweigh the costs to the animals involved, and where the procedures are most likely to produce satisfactory results.'

The startling inconsistency in this answer is hardly difficult to detect – the Home Office will never grant permission for animals to be experimented upon, it was saying, unless it is sure that such experiments produce benefits that outweigh the harm done to the animals. Yet it has never itself bothered to develop a formal test – based on its own research or anyone else's - by which it can make such a judgement

'Most of the animal tests we accept have never been validated. They evolved over the past 20 years and the FDA is comfortable with them.' - Anita O'Connor, Food and Drug Administration (USA)¹¹

Better research methods

There are more reliable methods to predict the safety and effectiveness of drugs for people. These include *in vitro* (test tube) studies using human cells and tissues, and sophisticated computer simulations designed to mimic human metabolism. A ten-year international study proved that human cell culture tests are more accurate and yield more useful information about toxic mechanisms than traditional animal tests.¹² The British company Pharmagene uses human tissue exclusively, noting that 'a flood of new data on human genetics is making drug research in animals redundant. If you have information on human genes, what's the point in going back to animals?'¹³

Screening new drugs *in silico* (on computer) is now taking the place of many animal tests. German biotech company 4SC designs new drugs entirely in *in silico* and can process in one

day what would take other biotechs a month. 'The time is fast approaching when what we are doing will be the industry norm,' says chief executive, Ulrich Dauer. 'We have the accuracy, the speed and we don't waste time with drugs that are not going to work.'¹⁴

The following example illustrates the ineffectiveness of assessing drug safety in animals and the impossibility of detecting subtle human responses: Eight out of ten drugs that were withdrawn from the US market between 1998 and 2001 had serious side effects in women that had not occurred in men.¹⁵ All of them had, of course, been tested extensively in animals before they were released onto the market.

If men cannot predict the effects of drugs for women, how on earth can we expect to obtain reliable data from monkeys?



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Infectious disease research

Failure of the 'animal model'

Investigating diseases that infect humans in any species other than humans is nonsensical, as pathogens and immune responses to them are highly species specific. For instance, chimpanzees are essentially immune to the human AIDS virus, Hepatitis B and C viruses, the malaria parasite and many other pathogens to which humans are susceptible.

'Up to this very day, all infectious diseases affecting humans are far from having appropriate animal models and, even in those cases where such infections are possible, the symptoms observed in animals and the course of the disease are often very different from those encountered in humans.' - Handbook of Animal Models of Infection, Academic Press, 1999, p.7

The recent anthrax attacks in the US mail were initially not taken seriously enough because experiments on monkeys showed the bacterium was not fatal until 8-10,000 spores are inhaled. When people died from much smaller doses it became apparent that this does not apply to humans.

The same failings apply to vaccine development:

*'...prevention [of polio] was long delayed by the erroneous conception of the nature of the human disease based on misleading experimental models of the disease in monkeys.'*¹⁶ - Dr. Albert Sabin, MD, inventor of the polio vaccine

Despite mounting evidence of vaccine research failures in animals, tens of thousands of primates and other animals have been killed in AIDS research over the past 20 years. This is despite the fact that infecting animals, even chimpanzees, with HIV does not produce an equivalent disease to human AIDS.

Chimpanzee AIDS research abandoned

This reality has long been recognised by many in the research community and by AIDS activists, who have campaigned hard against futile vaccine research in monkeys.

*'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.'*¹⁷ - Dr. Mark Feinberg, leading AIDS researcher

After an extensive review of the American AIDS research programme, the US government concluded that chimpanzees are a deficient 'model' for use in AIDS research and redirected \$10 million of funding. Even the director of the Yerkes Primate Centre admitted that 15 years of AIDS research in chimpanzees had produced little data relevant to humans.¹⁸

Everything we know about HIV and AIDS has been learned from studying people with the disease - through epidemiology and *in vitro* research on human blood cells. Using primates to predict how humans will respond is not simply unproductive, it has resulted in medical catastrophe. In the early 1980s, the observation that HIV did not affect chimpanzees led scientists to assume that the virus would be harmless to humans too. They consequently advised health authorities to allow transfusions with contaminated blood samples, thereby giving rise to the French blood scandal that claimed thousands of innocent victims.

False promise

The first five-year trial of an HIV vaccine, 'Aidsvax', based on success in animals has recently been pronounced a failure.¹⁹ The 8,000 high-risk volunteers in the trial were not protected from HIV infection by the vaccine. Many thousands of participants have been given false expectations which have been cruelly dashed.

Far too frequently, animal models have been used to develop vaccines that are effective in laboratory animals but are ineffective, or actually harmful, in humans. AIDS is a terrible illness, and research money and personnel need to be directed toward methodologies that are viable. Using an archaic methodology like animal models to combat a 21st century disease is more than foolish, it is immoral.

Brain research

Exercise in futility

Experimenting on monkeys with the hope of unlocking the secrets of the human brain is an exercise in futility. The most dramatic difference between humans and any other species, including the great apes, is found in the central nervous system. Our brain is four times larger than that of a chimpanzee, which is four times larger than that of a macaque. The human brain is enriched with specific cell types implicated in communication, language, comprehension and autonomic functions.

*'For cortical regions, such as the language areas, we cannot use the macaque brain even as a rough guide as it probably lacks comparable regions.'*²⁰ - Francis Crick, co-discoverer of the structure of DNA

In addition to anatomical differences, the pattern of gene expression in our brain is dramatically different from that of the chimpanzee.²¹ Humans are distinguished from all mammals by their lack of a particular sugar molecule on the surface of cells, especially in the brain. It is likely that this profoundly affects brain development and function. Biochemical pathways in the human brain are unique.²²



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The image above was taken in July 2001. It shows Malish, a young long-tailed macaque, who was used in a series of exploratory brain research experiments from 1998 till late 2002 by the Hebrew University in Jerusalem. The published conclusion from this research - which is typical of primate experiments in labs around the world - was that 'non-verbal subjects learn to categorize abstract images by their ordinal number in the list'.

Many of the attributes that we most celebrate - such as our ability to express ourselves in prose, poetry, song and dance - are uniquely human. We are clearly different, very different, from chimpanzees.

Yet at British universities, including Oxford, Cambridge, Manchester and London, monkeys are still used - at taxpayers' expense - as models of human brain function.

This is despite the fact that human brains can now be studied non-invasively using high-tec scanners. These enable the conscious brain to be observed while engaged in a variety of cognitive tasks (e.g. talking, singing, reading, writing) of which monkeys are not capable - and thus could clearly not provide any relevant insight.

State-of-the-art research

Functional MRI scanners can monitor the brain activity of volunteers undertaking tests of memory and other skills, to reveal brain areas that are active during particular activities. Transcranial magnetic stimulation (TMS) temporarily disrupts brain function, allowing scientists to assess the impact of 'switching off' specific regions without permanently removing them. The Dr Hadwen Trust for Humane Research is funding such studies into epilepsy research at Oxford University. There are many other state-of-the-art imaging techniques now available, including PET (positron emission topography), CAT (computer-aided tomography), MEG (magnetoencephalography), EROS (event-related optical signals) and VBM (voxel-based morphometric analysis). These remarkable techniques are able to differentiate such subtleties as musical ability or whether



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someone is lying or how hard they are concentrating. Insights that can be gleaned from monkeys seem absurdly crude by comparison.

One recent study of macaque monkeys at Oxford University was aimed at determining the role of the cerebellum in cognition, by making a series of lesions in their cerebella.²³ The monkeys' skulls were opened and 16 separate injections were made of an acid into the right hemisphere, followed a week later by further open-skull surgery and 16 injections into the left hemisphere. The animals were then tested, thousands of times, on cognitive tasks they had been trained to perform before their brain damage. Then they were killed and their brains extracted for analysis. The experiment served only to emphasise the difference between human and monkey brains, by contradicting similar studies that had already been conducted with brain-damaged human subjects. Self-evidently, the only way to investigate human brain function is to study the human brain. Results from the brains of any other species are simply misleading.

Neurological disorders

A destructive wrong turning

Increasingly, marmosets and macaques are being used to study neurological diseases such as stroke, Alzheimer's, Parkinson's and Huntington's. Monkeys do not suffer naturally from any of these conditions, so researchers destroy parts of their brain in order to generate superficially similar symptoms and then test potential treatments. But there are important differences between these naturally-occurring diseases in humans and the artificially-induced monkey versions - differences that render the monkey data invalid. For example:

- Parkinson's disease becomes progressively worse in patients, while the chemically-induced marmoset version demonstrates gradual recovery²⁴
- plaques and tangles in the brain are the hallmark of Alzheimer's disease in humans but not in monkeys²⁵
- brain-lesioned marmosets used in the study of Huntington's disease do not replicate the pathology or symptoms of Huntington's disease²⁶
- the cause of the brain damage is different and one would therefore expect the treatment to be different too²⁴
- countless treatments for stroke have been developed in primates and other animals - yet all of them have failed or even harmed patients in clinical trials. *'Over-reliance upon such animal models [for stroke] may impede rather than advance scientific progress in the treatment of this disease'* - Professor David Wiebers, Mayo Clinic ²⁷

People provide the answers

Future advances in our understanding and treatment of neurodegenerative diseases will come from where they always have - human-based observation and ethical clinical research. Everything we know about these diseases has been learned from studying patients while they are alive and after they have died – as well as population research and studies using human tissues cultured from biopsies or from autopsy samples.

A new brain-imaging probe has allowed the visualisation of Alzheimer's plaques in the brains of living patients for the first time. This will enable earlier diagnosis and accurate monitoring of the effects of treatments. A number of genes implicated in both Alzheimer's and Parkinson's diseases have been discovered through population analysis. Biochemical pathways have been charted via the study of human brain tissue. It is now possible to keep slices of living brain tissue alive for weeks, allowing researchers to study the effect of chemicals on entire neural networks, not just individual cells. Tissues from different parts of the brain can be co-cultured on the same chip to examine the communication between them.

Population studies have demonstrated links between dementia and high cholesterol diets, as well as with smoking, inadequate vitamin B12 and folate intake, and low oestrogen levels. Valuable discoveries such as these, from human-based research, render the study of artificial approximations of the disease in animals redundant.

'Alzheimer's, Parkinson's and other neurodegenerative diseases occur in humans and it is in human tissue that we will find the answers to these diseases' ²⁸ - Dr. John Xuereb, Director of the Cambridge Brain Bank Laboratory



Victory over the Cambridge Primate Centre!

In January 2004, the campaign against primate experiments won a landmark victory when Cambridge University announced it was abandoning plans for a multi-million pound primate research centre it had hoped to build. The University announced its decision just weeks after the Deputy Prime Minister granted planning permission for the new lab, which would have been the largest of its kind in Europe.

The project had been simmering for many years but had been held up by the local district council's refusal to grant planning permission. The University eventually appealed and a public inquiry was carried out, presided over by a government inspector. Evidence was submitted by parties both for and against the project. Animal Aid played a central role in bringing together a coalition of doctors, scientists and animal welfare organisations to dispute Cambridge's claims that the new centre would be of 'national importance' and to demonstrate the futility of primate experiments.

The results of the inquiry were staggering: Presiding Planning Inspector, Stuart Nixon, concluded, in a lengthy report, that Cambridge University had failed to show that there was a 'national need' for the laboratory and categorically recommended that the project not go ahead. The report was as comprehensive a rejection of Cambridge's case as can be imagined. It is no exaggeration to state that his findings, in themselves, amount to an historic victory for opponents of animal experiments.

Amongst some of the comments Inspector Nixon made were:

'... On the basis of the technical input, I could not conclude that need in the national interest is demonstrated insofar as this pertains to the scientific/medical research and procedures undertaken by the University', and 'In fact, if one accepts the premise that wherever possible research should not involve animals, it would be a stronger argument to say that it is nationally important to keep together and service the excellent and acknowledged research expertise in Cambridge to catch up on alternative forms of research to that employing animals.'

However, in spite of his conclusions, Deputy Prime Minister, John Prescott, chose to ignore Inspector Nixon's report and gave the labs the go-ahead.

As outrageous as his decision was, it was not entirely surprising given that both Tony Blair and Science Minister Lord Sainsbury – a man with a major financial stake in the biotech industry, and who is also a major donor to the labour party – had already publicly supported the project.

Animal Aid joined together with the National Anti-Vivisection Society (NAVS) to challenge in the High Court John Prescott's decision. With that hearing pending, the news that the University was abandoning its plans was announced.

The University blamed lack of funding for its u-turn. The reality is that it was besieged on all sides:

- It had already failed at the public inquiry to prove the proposed merits of the research to be carried out there.
- Animal Aid and the National Anti-Vivisection Society had filed a High Court challenge to John Prescott's decision.



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Read our Cambridge Inquiry evidence

Animal Aid, working alongside local Cambridge campaigners, played the leading role in bringing together the National Anti-Vivisection Society, Uncaged, PETA, Naturewatch and local activists, X-CAPE (Cambridge Against Primate Experiments), for joint written and oral submissions to the Cambridge Inquiry. The 'coalition's' scientific witness was Ray Greek MD, Medical Director of Europeans For Medical Advancement and co-author of two ground-breaking books on the failings of the 'animal model' for human medical research. Read his written evidence at www.animalaid.org.uk/campaign/vivi/proof.htm - plus further evidence at www.navs.org.uk/cambridgeenquiry.html). The British Union for the Abolition of Vivisection made a parallel presentation to the inquiry, based on the findings of its Cutting Edge undercover investigation of primate research at Cambridge University itself (see page 21).

Examples of experiments on monkeys:

1. At Cambridge University, 12 marmosets were given ten or more injections into their brains of a seizure-causing chemical. For nine months they were set tasks. One involved having one hand immobilised with sticking plaster then being forced to reach for food 'rewards'. Unsurprisingly, the researchers noted that the brain damage caused 'clumsiness'. In other tests, researchers bound the monkeys' feet with sticky labels and checked how long it took them to bite and tear their way free. At the end of the study the monkeys were killed.³⁰

2. At Oxford University, monkeys were brain-damaged by injection of a toxic chemical or by surgical mutilation. To investigate their reaction to stress and frustration, the researchers devised a 'frustration task', in which food was visible but out of reach.³¹

3. At Guy's, King's and St.Thomas' School of Biomedical Sciences in London, 18 marmoset monkeys were nerve and brain-damaged, through daily injections a toxic chemical, in an attempt to mimic certain symptoms of Parkinson's disease. The animals suffered a range of dysfunctions, including freezing of movements, tremors, loss of control and unstable posture, and they were unable to make any sound.³²

- In 2003, more than 130 MPs had signed an Animal Aid-initiated Early Day Motion calling for all primate experiments to be banned – on the grounds that they cause suffering and are not medically useful.
- The public had registered its opposition to monkey research through opinion polls we commissioned (NOP, April 2003).
- There was growing resistance within the university itself due to the controversial nature of the project and the massive financial burden it would place upon an institution already heavily in debt.

Future moves

As things stand, the planning permission granted by Prescott is active for five years. Technically, within that time-frame, Cambridge can come forward and announce it has the money to build the new centre after all. Which is why we shall not abandon the legal challenge until we are certain that Cambridge's monkey centre plans are disposed of for all time. (At the time of going to press, the High Court hearing has yet to take place.)

Meanwhile, primate experiments continue to be carried out within existing departments at Cambridge University, and at other universities across the UK.

Differences are in the genes

Evolutionary theory explains why we cannot use one animal to glean detailed knowledge about another. It is the different genetic make-up of different species (which ensures their reproductive isolation; the very definition of a species) that prevents them from being able to 'model' one another in terms of how they will respond to a disease or a drug. The differences are not between the structural genes (which build the body) - it is true that structural genes are remarkably similar across the species. Rather, the differences are in the way the structural genes are turned on and off by the regulatory genes. It is as though humans and monkeys share a common genetic keyboard on which very different tunes are being played. What matters is not similarity with respect to the keyboard but differences with respect to the order and timing of the pressing of the keys.

'Each species is a small universe in itself, from its genetic code to its anatomy, behaviour, life cycle and environmental role, a self-perpetuating system created during an almost unimaginably complicated evolutionary history.'²⁹ -

Dr. Edward O. Wilson, Emeritus Professor of Comparative Zoology, Harvard University

Current primate research at Cambridge University

Cambridge University already conducts monkey brain experiments related to the study of stroke, Parkinson's, Huntington's and other neurological disorders. Animal Aid exposed serious flaws in these experiments in its 2001 Mad Science Awards (available at www.animalaid.org).

Additionally, the BUAV published a report in May 2002 arising out of a ten-month undercover investigation of Cambridge University's primate brain research programme (www.buav.org/zerooption/index.html). The report reveals shocking evidence of animal suffering and a number of breaches of Home Office licence regulations.

The cutting edge

Marmosets were subjected to major surgery in which their skulls were sawn open and parts of their brain sucked out. They were then left unattended overnight, while suffering tremors and bleeding head wounds. Incredibly, these experiments were formally categorised by the Home Office – which is charged with regulating such activities - as leading merely to 'moderate' rather than 'substantial' suffering.

The BUAV investigation additionally revealed that several aspects of housing and husbandry at Cambridge contravened the Universities For Animal Welfare guidelines. Before and after surgery the monkeys were deprived of water for 22 hours per day to force them to perform the tasks for which they were being trained. Food restriction was also employed as a motivational tool. Stress is inevitable if animals are unable to drink when thirsty or can see cage-mates being fed while they are not. Yet the university stated in its Cambridge inquiry evidence that 'it is vital for the experiments that the animals are stress-free'.



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Most of the University's primate experiments have been performed on marmosets. But future research will focus on macaques, because marmosets' brains, Cambridge has admitted, are 'too small'.

Centre of excellence

The UK could be a centre of excellence in neuroscience without resorting to animal use. The Neurosciences Research Institute at Aston University is a prime example of such foresight, with its new 'Academy of Life Sciences' scheduled to open in 2004. The £8 million Academy will provide the opportunity for innovative cross-disciplinary work by the integration of clinically related research in neuroscience. It will include research groups working on behavioural and cognitive sciences, neuro-imaging, vision and ophthalmology - the focus being entirely on humans, rather than animals.

World-class research on human brains, both living and post-mortem, such as that conducted at Aston University, the Wolfson Brain Imaging Centre and Cambridge Brain Bank, is the key to the future of neuroscience. It is time the public knew that using nonhuman primates is archaic and dangerous to human health.

'The true enemy of excellence is conservatism, an unthinking adherence to the shibboleths of the past' - The Observer, 17 Nov 2002, Vernon Bogdanor, Professor of Government, Oxford University

Second legal challenge to Cambridge

Following hard on the heels of the joint Animal Aid/NAVS High Court challenge, the British Union for the Abolition of Vivisection (BUAV) launched its own important case in which the government and Cambridge University are again in the dock.

Said a BUAV statement: 'We are taking the Government to court in a Judicial Review, using our shocking undercover investigation of primate brain research at Cambridge University as the main evidence. The BUAV believes that the Government routinely underestimates (and therefore misrepresents to the public) the level of suffering experienced by animals - particularly primates - used in experiments. The BUAV's undercover expose at Cambridge University, as well as many other BUAV investigations dating back over 14 years, provide ample and damning evidence.

The BUAV aims to show how the Home Office fails to take account of many aspects of lab animal suffering when applying what the law calls the "cost:benefit" test (weighing up the cost to the animal against the perceived benefit of performing the test). The appalling Cambridge experiments (involving monkeys having the top of their skulls sawn off and parts of their brain sucked out) were categorised by the Government as causing only "moderate" suffering. The BUAV intends to use its Cambridge investigation evidence to challenge this position.'

Did primate experiments cause African AIDS catastrophe?

On September 11-12th, 2000, the Royal Society hosted an extraordinary meeting, convened to examine the theory that the AIDS epidemic was sparked by trials of oral polio vaccine (OPV) in Africa in the 1950s. The theory claims that SIV (simian immunodeficiency virus), an organism naturally carried by chimpanzees without ill effect, was unwittingly passed to humans in contaminated polio vaccines which were cultured in ground-up chimpanzee kidneys. Once in its new host, the virus mutated into HIV (human immunodeficiency virus) with devastating effect: 50 million people are now infected, most of them in Africa. The evidence which first pointed to such an outcome was the striking correlation between the earliest African AIDS cases and the sites of OPV trials in the former Belgian Congo between 1957 and 1960. The theory's main proponent is former UN official and BBC correspondent, Edward Hooper. Having researched the issue for more than 10 years, he sets out his case in *The River: a Journey to the Source of HIV and AIDS* (Little Brown, 1999).

Oxford University Undeterred

With media coverage of the Cambridge saga only just dying down, reports of a new facility under construction at Oxford University started to appear.

Media coverage reported that the new building would only house animals and that no actual research would be carried out. The Guardian quoted a university representative as saying: *"The most important point to stress is that this is not a research facility, it is for housing animals..."*

Unfortunately however, this is far from the truth.

Animal Aid has seen the planning application and it clearly states that the university is applying for permission for *'Demolition of existing buildings and construction of research facilities'* and for *'Provision of research laboratories and specialist accommodation to support research groups in the adjacent Science Area'*. The plans state that 31 staff will be transferring to the new facility from the departments of Experimental Psychology, Zoology, Physiology, Human Anatomy, Biochemistry and Pharmacology and that a further 47 new research staff will be accommodated.



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A researcher from Oxford also tipped off campaigners that, for some time, Cambridge and Oxford universities had been in discussion over the possible transfer to Oxford of some primate research originally planned for Cambridge. The fact that the new centre will be linked by a high level walkway to the University's existing departments of Experimental Psychology and Zoology - both known for conducting primate experiments - backs up this suspicion.

Animal Aid will, once again, take on the challenge of showing Oxford University the only way forward is to abandon primate research (and all animal experiments) and focus on human-based research instead.

Viral threat to humans

There is a real and potentially serious risk of an outbreak of human infection resulting from primate use and consequent disposal of their waste products and body parts into the drainage and disposal systems. Primates carry a range of diseases that can be harmful, even fatal, to humans. The herpes simian B virus, which infects 80-90% of macaques, is a classic example of a virus that can be dangerous to humans once out of its host species in whom it causes no illness. Twenty-nine people have died from B virus infection, all of them laboratory researchers or animal handlers.

Marburg Disease is named after the German town where the first outbreak occurred in 1967. Twenty-nine laboratory workers became infected, suffering high fever, slow heart rate, headaches, inflammation of the eyes, stomach ache, vomiting, diarrhoea, and prostration. Seven died. They had been exposed to tissues or cell cultures from recently-imported African green monkeys.

In 1989, the US authorities in New York State banned all imports of long-tailed, rhesus and African green monkeys when it was suspected that long-tailed macaques supplied from the Philippines were infected with the lethal Ebola virus. They were actually infected with Reston Strain Filovirus, as were two other macaques in 1996. The Philippines government temporarily banned the export of monkeys while levels of filovirus infection were investigated; one facility holding animals infected with the 'Reston' virus was subsequently closed and hundreds of monkeys were destroyed.

Between 1955 and 1963, millions of people were exposed to monkey virus SV40 through contaminated oral polio vaccines made from monkey kidneys. At the time, the virus was thought to be harmless. SV40 is now known to be associated with several human cancers. Nevertheless, monkey tissues are still used in vaccine production.

Monkeys undoubtedly harbour innumerable viruses that science has not yet identified. Clearly, it is impossible to screen for agents that we don't yet know exist. Who can predict what perils we may unwittingly unleash upon ourselves, without even realising our mistake for years or decades? This is especially the case where disease symptoms take time to become evident - as with AIDS or CJD.

Twenty-four monkeys escaped from primate research facilities in the US in March 2003 alone, illustrating that total containment, even of the live animals, cannot be assured in practice. Mistakes can and will occur.

Following the public inquiry into the proposed Cambridge primate labs, Inspector Stewart Nixon's report declared:

"... it is worth noting the Oxford Professor who cites the closure of part of a building in Oxford University as a direct result of viral escape."

What you can do

Experiments on primates have no future. Science is moving away from outdated studies of human disease in the wrong species, towards more productive and clinically relevant methodologies.

There are a number of ways you can support the campaign against primate research. Your help is vital. Without public pressure, researchers will continue to waste time and money on primate experiments, causing enormous suffering and to the detriment of human health.

Get Active!

- Send for a free End Animal Experiments action pack describing ways you can help us end all animal experiments
- Write to the Vice Chancellor of Cambridge University thanking her for pulling out of the monkey lab project. Ask her to build on that decision and put Cambridge at the forefront of science by implementing a University-wide ban on primate experiments and focus on human-based research instead.

Write to:

Professor Alison Richard
Vice Chancellor's Private Office
The Old Schools
Trinity Lane
Cambridge CB2 1TN

- Write to Professor Colin Blakemore, Chief Executive of the Medical Research Council. Let him know that you do not want primates to be imprisoned and tortured for the supposed benefit of human health when it is known this type of research does not work. Urge the MRC to fund non-invasive research projects on human volunteers using state-of-the-art scanners and other techniques.

Write to:

Professor Colin Blakemore
Chief Executive
Medical Research Council
20 Park Crescent
London W1B 1AL

- Write to your MEP and ask him/her to vote for a complete ban on primate experiments when the European commission publishes its long-awaited proposal for a revision of Directive 86/609 (which determines how member states of the EU regulate the use of animals in experiments). To find out who your MEP is, go to www.europarl.org.uk or call 020 7227 4300.

Write to him/her at:
European Parliament
Rue Wiertz
Brussels 1047
Belgium

- Sign the BUAV Zero Option petition demanding an end to all UK monkey experiments. Go to www.buav.org/zerooption/index.html or call the BUAV on 020 7700 4888 to order hard copies.

Please keep letters polite!



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**Animal Aid exposes and campaigns
peacefully against all animal abuse,
and promotes a cruelty-free lifestyle.**

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