

The first ten years

ANZCCART celebrated its tenth birthday on 6 May this year, an anniversary commemorated by this issue of its quarterly newsletter. The first issue of *ANZCCART News* was published in Spring, 1988.

You will notice the new layout and style of the newsletter – long overdue, some readers will say! *ANZCCART News* has been described as the flagship publication of ANZCCART and has a high reputation in Australia and New Zealand as well as in other countries. Its content covers a wide range of interests and issues and is principally intended for scientists and technicians working with animals in research, teaching or testing, members of animal ethics committees and government animal welfare administrators. It is also read by members of animal welfare organisations and interested members of the public.

Since the first meeting of its Board in May, 1987, there have been many people associated with ANZCCART, as members of the Board, of Council or as contributors to conferences, workshops and publications such as this. These contributions have been honorary and have been given with the aim of fulfilling ANZCCART's objectives and reasons for being (see below). ANZCCART would not have succeeded without the time and effort provided by many people over the years.

Particular mention should be made of the three Chairpersons over this period. The first was Professor Alec Lazenby, then Vice-Chancellor of the University of Tasmania, who represented the Australian Vice-Chancellors' Committee (AVCC). Following the 1990 Review, it was agreed that the Chairman should be an independent person. Associate

Professor Loane Skene filled this role admirably from December, 1991 until August, 1995. A law graduate, initially with the Law Reform Commission of Victoria, she is now in the Faculty of Law at the University of Melbourne. Biomedical ethics remains one of her research interests.



Associate Professor Loane Skene

Professor Malcolm Nairn, Vice-Chancellor of the Northern Territory University, acted as Chairman until Dr Elizabeth Close assumed the Chair in January, 1996. Dr Close is a Senior Lecturer in French and Romanian at Flinders University in Adelaide and was a member of the NHMRC's Animal Welfare Committee for some years, as well as Chairman of the Flinders University Animal Welfare Committee for more than ten years. She has brought this experience and a

strong personal interest in animal welfare to the position.

Special mention must be made of the support given to ANZCCART from its foundation by Associate Professor Margaret Rose from the University of New South Wales. This has comprised assistance with the newsletter, including writing many articles and providing advice and assistance with conference programs and organisation. Others who played leading roles in the formation and establishment of ANZCCART include Professor Warwick Anderson, National Health and Medical Research Council (NHMRC), Dr Alan Donald (CSIRO) and Mr Chris Puplick (lay member).

ANZCCART is an umbrella organisation, comprising representatives of a wide range of organisations, including State, Territory and National Governments, major research and teaching organisations and scientific societies. As such, it relies on its network of members for its effectiveness.

The first Executive Officer, Mr Denis Daly, did much to establish the organisation and give it national standing. His advice and assistance is still provided from time to time and is always useful.

Contents ...

ANZCCART workshops for 1998	3
USA Animal Welfare Center	3
New Melbourne Animal Welfare Centre	4
Animal Welfare in New Zealand	5
Professor Morton visits Australia	7
Letters	8
Survey of New Zealand AECs	10
News	12

Insert: Index to volumes 1 to 10

ANZCCART's Mission is:

To provide leadership in developing community consensus on ethical, social and scientific issues relating to the use of animals in research and teaching.

ANZCCART's key objectives are to promote:

- excellence in the care of animals in research and teaching;
- responsible scientific use of animals; and
- informed discussion and debate within the community regarding these matters.

The development of ANZCCART in New Zealand was due to the efforts of a number of people, in particular Dr David Bayvel, from the Ministry of Agriculture, Dr Catherine Smith, a Past-President of the New Zealand Veterinary Association and Mr Ross Moore from the Royal Society of New Zealand. Professor David Mellor and the late Dr Cam Reid from Massey University strongly supported ANZCCART. Professor Mellor's support continues as a member of the Board, representing the Royal Society of New Zealand.

Evolution

ANZCCART was originally established as ACCART, with its three major sponsors being the AV-CC, CSIRO and the NHMRC. Its office from 1988 until 1991 was located in the CSIRO's Head Office in Canberra and staffed by Mr Denis Daly, who was seconded half-time from CSIRO for this period.

One of the recommendations of the 1990 Review was for the office to be located in a major university. An offer to provide accommodation within the University of Adelaide was accepted and ACCART moved to its present home in February, 1992. This coincided with the expansion of the staff from one half-time Executive Officer to a full-time Executive Officer and an Administrative Assistant.

The major sponsors expanded to five with the addition of the Australian Research Council (ARC) and the Royal Society of New Zealand (RSNZ) in 1993. The trans-Tasman expansion necessitated the change of name to ANZCCART on 1 January, 1993. ANZCCART was incorporated as a non-

profit company under the Australian Incorporations Law in February, 1994 and has its own Memorandum and Articles of Association. It publishes an Annual Report, which includes audited financial statements, as well as a summary of activities during the year. These are presented each year by the Board to the Annual General Meeting.

Activities

ANZCCART's first conference was a two day meeting of international specialists on human and animal pain, together with the philosopher, Professor Peter Singer. This was held in the Barossa Valley in April, 1990 and included some of the leading participants in the Sixth World Congress of the International Society for the Study of Pain, which preceded it and was held in Adelaide.

From 1992 until 1997, ANZCCART has held eight conferences, in Adelaide, Sydney, Melbourne, Christchurch, Wellington, Perth, Canberra and Auckland. The meeting in Perth was held jointly with the University of WA. Proceedings of all except the meetings in Perth have been (or are being) published. These provide an excellent record of debate and discussion and have been very well received nationally and internationally.

Since 1994, a Student Award has been offered annually. This is given to an honours or postgraduate student working in an area relevant to the conference theme. It covers travel, accommodation and registration fees for the conference and the student is required to give a short paper on his or her research work.

Workshops have been

held in Darwin, Brisbane, Perth, Melbourne, Canberra and Auckland. These include the use of immunoadjuvants in animals; general discussions of the use of animals in research and teaching and two meetings of animal welfare officers. Further meetings and workshops are planned for 1998 and future years, on topics of current interest.

In 1994, Mr Chris Puplick gave a public address on behalf of ANZCCART in Sydney and Melbourne during Medical Research Week. This was later published as a short monograph.

A new initiative in 1997 has been for ANZCCART to sponsor a paper (or, in one case, a poster presentation) in other societies' conferences. This allows the ANZCCART message to reach an audience of practising scientists who may not otherwise have access to such information. Conferences targeted in 1997 were the Australian Mammal Society, Australian Physiological and Pharmacological Society, Australian Society for Medical Research and the Australasian Society of Clinical and Experimental Pharmacologists and Toxicologists.

In addition, ANZCCART has been represented at the first and second World Congresses on Alternatives and Animal Use in the Life Sciences, held in Baltimore, USA and in Utrecht, The Netherlands.

From time to time, ANZCCART has hosted seminars by overseas visitors. These have included Dr David Wilkins from the RSPCA (UK) and the Eurogroup for Animal Welfare; Dr Joanne Zurlo, from the US Center for Alternatives to Animal Testing; and Professor David Morton from the University of Birmingham, UK.

How successful has ANZCCART been?

This has been addressed in the two external Reviews held (1990 and 1995) and each time the answer has been very positive. The 1995 Review Report concluded that:

ANZCCART has now become established as an authoritative source of information on expert and humane care of animals in research and teaching. In recent years it has shown a willingness to listen to other groups in society who oppose such use; and to modify its own behaviour and attitudes – it has become recognised as an independent body in its own right.

ANZCCART's goals and programs have been relevant, worth pursuing and achieved to a commendable degree.

What does the future hold?

The use of animals for scientific purposes is frequently the subject of media articles and of public demonstrations. It arouses strong feelings in many people.

One of ANZCCART's major roles is to promote informed discussion and debate within the community on these issues. This is a difficult, but very important, task and is likely to remain so. The demonstration held outside the conference centre at the University of Auckland during ANZCCART's conference in September illustrated the intensity of feeling among the demonstrators as well as the difficulty in establishing communication and breaking down barriers.

ANZCCART is committed to supporting the *Australian Code of Practice for*

the Care and Use of Animals for Scientific Purposes and its New Zealand counterparts. These include the need to implement the three principles of Replacement, Reduction and Refinement.

ANZCCART's motto is *humane science*, and it will continue working to achieve this in every possible way.

Robert Baker
Executive Officer

Note:

For more detailed information about the evolution of ANZCCART, refer to pages 3 to 7 in the first ANZCCART Annual Report (1994).

Two workshops for 1998

The Board has agreed to hold national workshops in Australia in 1998 on two important areas of concern. The first is the Sourcing of Experimental Animals – What is the Current Situation? This will examine problems with supply of experimental animals, including traditional laboratory animals as well as pound animals and wildlife.

The second topic will be The Use of Analgesia in Experimental Animals, a subject currently under discussion in a number of Australian universities. This workshop will be very timely in bringing together scientists, animal welfare officers and AEC members.

The first workshop is likely to be held in May, in association with ANZCCART's Annual General Meeting and the second in September. Further details will be provided in the March, 1998 issue of *ANZCCART News*.

USA Animal Welfare Information Center (AWIC)

This year also marks the tenth anniversary of the foundation of the Center, which is part of the National Agricultural Library (NAL) of the US Department of Agriculture, Washington DC. AWIC was established as a result of the 1985 amendments to the US Animal Welfare Act, which celebrated its thirtieth anniversary last year.

The foundation and subsequent history of AWIC is covered comprehensively in the July/August issue of the NAL publication *Agricultural Libraries Information Notes*. This includes the announcement of a new CD-ROM (CARE) about animal care and use. The acronym CARE stands for Compendium of Animal Resources and it was produced by AWIC for those using animals in research, testing and education. It provides ready access to more than 160 documents, including US government regulations and the animal care policies of professional scientific societies. It also contains bibliographies of animal care articles, as well as the full text of articles, reports, conference proceedings and manuals.

Copies of the disc are available for \$US35.00 from: Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954, USA. (Fax: 1 202 512 2250. Specify stock number 001 000 04634 9).

AWIC produces a quarterly newsletter, which is free of charge. For more information, contact AWIC at (fax:) 1 301 504 7125 or email: awic@nal.usda.gov.

ANZCCART is part of a world wide network of organisations and individuals concerned with the humane use of animals in science. AWIC is one of these.

The establishment of a new Animal Welfare Centre in Melbourne

The Animal Welfare Centre in Melbourne was established on 24 March 1997 by the University of Melbourne, Monash University and Agriculture Victoria. The primary function of the Centre is to focus and coordinate the research and academic resources of the three collaborating organisations, to provide the farming community, the general community and the academic community with an internationally competitive research, teaching and training resource in animal welfare. The desired outcomes for the three collaborating organisations in the Centre are improvements in the welfare of farm, laboratory, companion and captive animals, generation of agricultural wealth through sustainable animal welfare practices in agriculture and improvements in the quality of life of people through a better understanding of human-companion animal relationships.

The Centre is an unincorporated joint venture between the University of Melbourne, Monash University and Agriculture Victoria and has

scientific and academic staff at the Victorian Institute of Animal Science (Agriculture Victoria), Institute of Land and Food Resources (the University of Melbourne), and the Departments of Psychology and Physiology (Monash University).

A Board of Management, comprising senior staff representatives from the partner organisations, is responsible for establishing policy and monitoring management of the Centre. Professor Paul Hemsworth has been appointed as the Director of the Centre and is responsible to the Board of Management for the programs, operations and conduct of the Centre. An Advisory Committee, comprising eminent scientists and representatives of funding, farming and animal welfare organisations, provides advice to the Centre on future opportunities, directions and funding.

A five-year plan has recently been prepared by the Centre with the help of various industry organisations and individuals, setting out the programs of the Centre to improve the welfare of farm,

laboratory, companion and captive animals in Australia. The main programs of the Centre are as follows:

1. Basic research on welfare methodology

Improve the scientific assessment of animal welfare.

2. Basic and applied research on human-animal interactions

Evaluate the impact of human-animal interactions on animals and humans.

3. Housing practices

Evaluate the welfare and productivity implications of contentious housing practices in order to develop alternatives when necessary.

4. Husbandry practices

Evaluate the welfare and productivity implications of husbandry practices to develop alternatives when necessary.

5. Undergraduate and graduate courses and programs in animal welfare

Develop and implement courses and research programs for undergraduate and graduate students.

6. Training programs on animal welfare

Develop training programs for animal handlers and owners to improve animal welfare and performance.

7. Public education

Provide Government, research institutions, farming and animal welfare groups and the general public with scientifically valid advice on animal welfare.

Further details of the operation and function of the Centre can be obtained from any of the following members of the Centre.

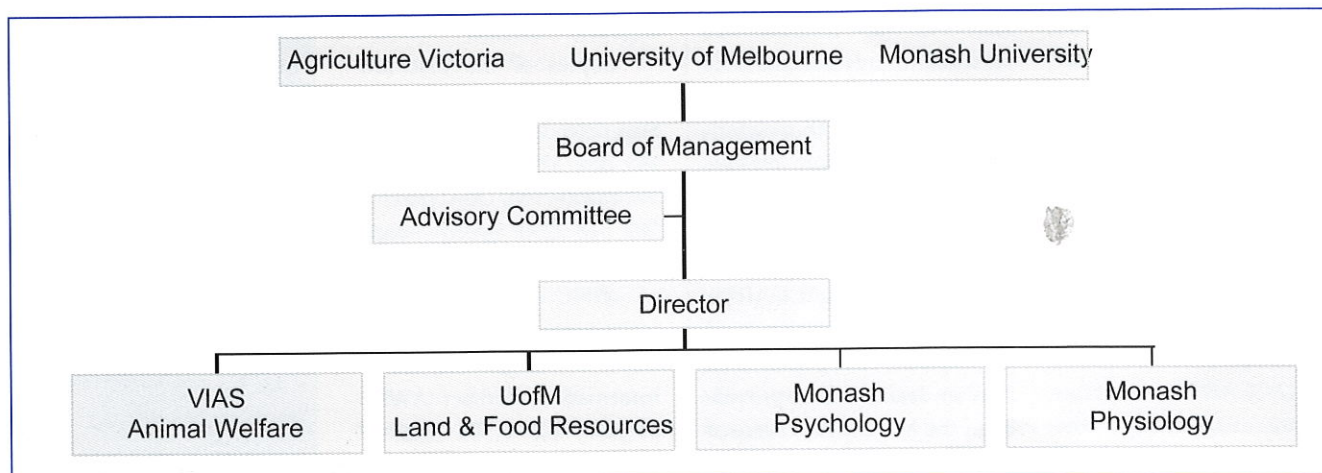
Prof Paul Hemsworth
Animal Welfare Centre
VIAS, Werribee Vic 3030

Dr John Barnett
Victorian Institute of
Animal Science
Werribee Vic 3030

Prof Grahame Coleman
Dept of Psychology
Monash University
Caulfield Vic 3145

Dr Alan Tilbrook
Dept of Physiology
Monash University
Clayton Vic 3168

The operational structure of the Centre



Animal Welfare in New Zealand — Concepts, Committees, Consultation and Codes of Practice

Over the last decade or so, a New Zealand infrastructure has been established at a national level which allows rational debate on animal welfare issues, extensive consultation with all stakeholders, and ensures that policy and practice are aligned with international norms.

Key milestones in the establishment of this infrastructure include the following:

1984: Establishment of the National Animal Ethics Advisory Committee (NAEAC)

1987: Introduction of the Animals Protection (Codes of Ethical Conduct) Regulations

1989: Establishment of the Animal Welfare Advisory Committee (AWAC)

1991: Establishment of the Animal Behaviour and Welfare Research Centre (ABWRC) at Ruakura

1993: Formation of ANZCCART, by inclusion of The Royal Society of New Zealand as a sponsor member of ACCART

1994: Appointment to the AGMARDT Chair in Animal Welfare Science at Massey University

1995: Formation of the Animals in Schools Education Trust (Aiset)

These various initiatives have ensured that New Zealand is perceived, both domestically and internationally, to be addressing animal welfare issues in a structured

manner and that policies are formulated on the basis of available scientific data and after full consultation with all interested parties.

The National Animal Ethics Advisory Committee (NAEAC) has recommended for approval more than 70 codes of ethical conduct, while the Animal Welfare Advisory Committee (AWAC) has coordinated the development, and subsequent revision, of 19 separate codes of recommendations and minimum standards. These codes are increasingly being integrated into industry quality assurance programmes.

When the Minister of Agriculture appointed the Animal Welfare Advisory Committee in 1989, three clear terms of reference were established. They were:

- * to review the *Animals Protection Act 1960* and advise the Minister on any changes required;
- * to develop codes of minimum standards for the welfare of particular classes of animal, and review existing codes; and
- * to recommend specific areas in which research into animal welfare matters is required.

AWAC decided that animal welfare information should be freely available and undertook to publish, as individual documents, a series of comprehensive codes of minimum standards.

At the time AWAC was appointed, the Ministry of Agriculture and Forestry (MAF) had an industry group working on a code for the operation of circuses. The Code of Recommendations

for the Welfare of Circus Animals and Information for Circus Operators was published as the first AWAC code in December 1990. As well as animal welfare information, the code contains information about permits, quarantine and inspections.

AWAC began a long and close association, through MAF Regulatory Authority (MAFRA), with its equivalent body in the UK, the Farm Animal Welfare Council (FAWC). FAWC has a successful history in publishing codes of minimum standards and recommendations and AWAC decided to follow the general approach of the FAWC codes.

In 1991, AWAC embraced the five freedoms as a point of reference for the New Zealand codes. These are:

- * freedom from thirst, hunger and malnutrition;
- * the provision of appropriate comfort and shelter;
- * the prevention of, or rapid diagnosis and treatment of, injury, disease or infection;
- * freedom from distress;
- * the ability to display normal patterns of behaviour.

AWAC recognised that without industry participation in the writing and acceptance of their principles, the codes would have little effect. Industry groups have therefore been invited to participate in code writing, as have the Royal New Zealand SPCA, Federated Farmers of New Zealand, and the New Zealand Veterinary Association.

Some codes have taken years to prepare. The code for the transport of animals is an

ANZCCART New Zealand is part of ANZCCART, but operates by means of its own Board. Its office is located in the Royal Society of New Zealand, Wellington. Dr Bayvel, the author of this article, has been closely involved with ANZCCART in New Zealand for a number of years (see also page 2).

example. The working group needed to take heed of transport standards being developed in the European Union, as they related to loading densities and journey times. The importance of codes in establishing credibility in international markets was emphasised in the latter stages of preparation of the transport code when a New Zealand shipment of venison to Germany was held up by German officials on the grounds that New Zealand did not have any animal welfare standards on animal transport. The shipment was released only after a message was sent through New Zealand's Veterinary Counsellor in Brussels that the transport code was almost complete. Not only do the codes need to be practical and acceptable in New Zealand, but they must also be credible in overseas markets, particularly in the European Union.

Experience has shown that codes do not need to be exhaustively prescriptive to be effective. More recently published codes and codes under development are focusing on outcomes rather than prescriptive requirements. In many industries, these can be best handled by quality assurance programmes that assist in determining the outcomes.

For instance, the deer velvetting code has provided the deer industry with a specific standard required to tie in with regulatory exemptions from the use of prescription animal remedies. The high standards prescribed by this code and the associated quality assurance programme set up by the National Velvet Standards Body play a vital role in the New Zealand deer industry.

At present codes do not have any specific legal status, but a breach of a code provision, while not an offence in

itself, can nevertheless be used in evidence to establish the guilt of a person accused of causing an animal suffering under the *Animals Protection Act 1960*.

Under the proposed *Animal Welfare Act* there will be three categories of codes: Codes of Animal Welfare, which will govern the standards of care of animals over which people have ownership or charge; Codes of Conduct, which will govern behaviour towards animals generally, such as in hunting, fishing, safari parks, pest control; and Codes of Ethical Conduct, which will continue to govern institutions that use animals for scientific and teaching purposes and for the production of biological products. Each code will be approved by the Minister of Agriculture on the recommendation of AWAC or NAEAC.

The proposed *Animal Welfare Act* will give codes a quasi legal status. It is intended that Courts will be obliged to take judicial notice of codes as establishing minimum standards against which ill-treatment and neglect offences will be judged. In the meantime, industries are gaining experience with using codes as industry standards and this will place them in good stead when codes are reviewed under the new legislation.

It is not intended that existing codes will simply be gazetted as codes under the new legislation. Each code will be reviewed with the relevant industry before AWAC will recommend to the Minister that the new code be adopted. To maintain their credibility, codes need to be relevant to their time. AWAC accepts that codes need to be constantly assessed and, where necessary, amendments are published or the entire code is reviewed.

AWAC endorsed a bobby

calf code in 1991 and that code was revised and re-issued in 1997. The sheep code has been completely reviewed and re-published. The codes for dairy cattle and circuses are being reviewed and the latter will be incorporated into the code for animals in entertainment. A detailed review of the section of the transport code dealing with long distance transport of dairy cows was undertaken with the affected industries and an amendment to the transport code was published. AWAC, along with the transport industry, MAF, Federated Farmers and the New Zealand Veterinary Association, is monitoring the effects of the amendment.

Codes currently in preparation include those relating to dogs, broilers and animals in entertainment. The latter will include circuses, rodeos, film production and live entertainment. The exhibit animals code is also scheduled for review.

In line with user-pays policies, a nominal charge of \$5 is made for codes. Copies of each code are issued free to industry groups affected by the code and key national stakeholder organisations (RNZSPCA, Federated Farmers of New Zealand, and New Zealand Veterinary Association) to create awareness. Copies are also distributed to key overseas agencies and for review in the international journal *Animal Welfare*.

David Bayvel
MAF Regulatory Authority
Wellington

Codes currently published include:

Circuses (1990)
Sea Transport of Sheep From New Zealand (1991)
Sheep (revised 1996)
Dairy Cattle (1992) (under review)
Removal of Deer Antlers (1992)
Rodeo Events (1992)
Horses (1993)
Bobby Calves (revised 1997)
Boarding Establishments (1993)
Slaughter of Animals at Licensed and Approved Premises (1994)
Sale of Companion Animals (1994)
The Animals Protection Act and its Effect on Those Responsible for Farm Animals (1994)
Pigs (1994)
Exhibit Animals (Zoos and Animal Parks) (1994)
Transport of Animals (1994)
Saleyards (1995)
Use of Animals for Scientific Purposes (1995)
Layer Hens (1996)
Emergency Slaughter of Livestock (1997)

AWAC has also published *Guidelines for the Welfare of Livestock from which Blood is Harvested for Commercial and Research Purposes* at the request of the National Animal Ethics Advisory Committee.

Codes are available from:

Animal Welfare and
Environment Section
MAF Regulatory Authority
Ministry of Agriculture
PO Box 2526
Wellington, New Zealand
Telephone: 04 474 4336
Fax: 04 474 4133
Email: awac@ra.maf.govt.nz

ANZCCART News: Index, Volumes 1 - 10 (38 issues) 1988 - 97

ANZCCART

ACCART changes	4(4): 1
ACCART to become ANZCCART	5(4): 7
Alternatives seminars	10(1): 9
ANZCCART e-mail discussion group to be established	9(2): 11
ANZCCART News on the Internet	9(4): 1
ANZCCART News on the Web	10(3): 11
ANZCCART now on the Internet	8(4): 6
ANZCCART publications	6(2): 10
ANZCCART's e-mail address	7(3): 4
ANZCCART's library	7(3): 2
ANZCCART's New Zealand Office	6(1): 4
ANZCCART's new brochure	7(2): 10
Chairman of ANZCCART New Zealand	6(3): 8
Changes to Board of ANZCCART	8(1): 5
Changes to Board of ANZCCART Australia	9(1): 11
Conference: Animal Pain: Ethical and Scientific Perspectives - Proceedings	5(2): 11
Conference: Effective animal experimentation ethics committees, 1992	5(2): 10
Conference: Ethical approaches to animal-based science, 1997	10(1): 10
Conference: The ethical and scientific perspectives of animal pain, 1990	3(1): 11
Executive Officer	5(1): 2
Executive Officer's overseas study tour	6(4): 8
Formation	1(1): 1
Laboratory Animals and Tumour Cell Lines Maintained in Australia	4(3): 3
Laboratory Animals and Tumour Cell Lines Maintained in Australia	5(4): 5
Listserver	10(2): 10
New ANZCCART publication: Alternatives to the Use of Animals in Undergraduate Teaching	6(2): 6
New Board structure	10(4): 9
Use of Animals in Undergraduate Teaching	6(2): 6
New Chairperson for ANZCCART Australia	8(4): 10
New sponsors	5(3): 3
New Strategic Plan for ANZCCART	9(2): 10
New Strategic Plan for ANZCCART	9(4): 1
New Zealand joins ACCART	5(3): 12
Participation in other conferences	10(1): 6
Participation in other conferences	10(2): 10
Queensland and Victoria join ANZCCART	6(1): 4
Review of ACCART: Announcement	3(2): 7
Review of ANZCCART	8(4): 6
Review of ANZCCART	9(1): 10
RSPCA (Australia) joins ANZCCART	6(1): 4
SCAW publications now available from ANZCCART	6(3): 6
Survey: Research animals and tumour cell lines	3(4): 8
Survey: Research animals and tumour cell lines	4(3): 3
Tasmania joins ANZCCART	10(1): 10
The Care and Use of Animals for Scientific Purposes: A Selected Bibliography. 1991	4(3): 3
The first ten years	10(4): 1
Obituary, Professor Geoffrey Thorburn	10(1): 11
Valediction, D. Daly	5(1): 4
Working parties	1(2): 10

AMPHIBIANS, REPTILES AND FISH

An improved method for housing laboratory frogs and toads using a miniature ecosystem	10(2): 4
Frogs and research	8(1): 5
Non-invasive ventilation monitoring in fish Sharks and Rays of Australia. CSIRO	4(3): 10
Systemic Pathology of Fish: a Text and Atlas of	

Comparative Tissue Responses in Diseases of Teleosts. Iowa State University Press. 1989.	4(4): 8
The Care and Use of Amphibians, Reptiles and Fish. SCAW	4(2): 12
The care of amphibians and reptiles	5(4): 5

ANIMAL BEHAVIOUR

Animal behaviour research	6(2): 10
Monkey housing: a room, a tree and a puzzle	5(1): 1
Problems of Animal Behaviour. Longman. 1989	5(3): 9
Rat communication	4(3): 4
Recent insights into cat social behaviour	8(4): 5
Social behaviour of rats and mice - individuals and groups	6(1): 10
The Behaviour of Sheep: Biological Principles and Implications for Production. CSIRO. 1992	5(4): 8
Through the looking glass: Issues of psychological well-being in captive non-human primates. APA	5(1): 2

ANIMALS IN BIOMEDICAL RESEARCH

Bovine somatotrophin (BST)	7(3): 12
Canada - animal use statistics	9(3): 12
Europe - animal use statistics	9(3): 12
Europe - patents on biotechnology products	7(2): 12
Improving the design of laboratory animal experiments	6(1): 6
Laboratory animal suppliers register	7(3): 11
Lives in the Balance. The Ethics of Using Animals in Biomedical Research. The Report of a Working Party of the Institute of Medical Ethics. OUP. 1991	5(2): 6
Reporting requirements for animal researchers	6(2): 12
The contributions of biomedical research to animal health. JAVMA. 1988	2(1): 10
The European Biomedical Research Association	7(4): 12
The Experimental Animal in Biomedical Research. Vol. 1: A Survey of Scientific and Ethical Issues for Investigators. CRC Press. 1990	4(2): 10
The Importance of Animals in Biomedical Research. Perspectives Biol. Med. 1987	2(1): 10
The National Statistics Package - background and progress	10(3): 1
The use of common marmosets in biomedical research	7(2): 3
The use of pigs for research with examples of research on housing and handling	10(2): 1
UK - Animal use statistics	9(2): 12
USA - Bovine somatotrophin	7(1): 12
Uses of Laboratory Animals in Biomedical and Behavioral Research. Nat. Acad. Press. 1988	1(2): 12

ANIMAL ETHICS COMMITTEES

Animal ethics committees: A matter of judgement	1(2): 1
Animal ethics committees: The role of the veterinarian. AVA. 1990	3(1): 6
Animal ethics committees: Their structure, function and ethical dimension. ASLAS. 1988	1(1): 5
Animal Research Review Panel - meeting of chairs of animal care and ethics committees, 1993	7(1): 8
ANZFAS assistance for animal welfare and lay members of AEECs	8(3): 12
Australian Animal Experimentation Ethics Committees: some proposals for effectiveness	9(2): 1
Canada - AEC responsibilities	7(2): 12
Checklist: Design and review of proposals	1(2): 3
Effective committees: 1989 SCAW meeting	2(4): 12
Field Research Guidelines: Impact on Animal Care	

and Use Committees. SCAW. 1988	1(1): 3
Functioning of a busy New Zealand animal ethics committee	10(1): 5
Information Package for AECs	10(4): 3
Making ethical decisions when the balance keeps swinging	9(3): 9
More on water deprivation	7(2): 10
National Animal Ethics Advisory Committee (NAEAC)	7(4): 3
National Animal Ethics Advisory Committee Workshop	6(2): 8
Prolonged water deprivation in experimental animals	6(3): 9
Protocol reviews	7(1): 3
SCAW to conduct study of animal ethics committees	8(1): 12
Science and Animals: Addressing Contemporary Issues. SCAW. 1989	1(2): 9
Striking the balance: the practitioner and the animal ethics committee	9(3): 1
Survey of New Zealand Animal Ethics Committees	10(4): 10
The need for change	9(3): 4
The role and responsibility of veterinarians on animal ethics committees	6(4): 8
The value of animal ethics committees	10(1): 3

ANIMAL MODELS

Animal Models in AIDS. Elsevier. 1990	4(3): 10
Animal models	9(2): 11
Animal models: 1990 conference	3(2): 12
Animal patents	6(1): 12
Artificial rats for dissection	6(2): 12
Biomedical models: Definition/characteristics	2(3): 5
Comparative Medicine: Animal Models in Biomedical Research. Academic Press	5(2): 7
Experimental Surgery and Physiology: Induced Animal Models of Human Disease. Williams and Wilkins. 1988	2(2): 9
Fish as model systems	2(4): 11
Immunodeficient rodents	3(2): 5
Patenting transgenics	4(2): 8
Preservation of animal models	4(4): 2
Rat models	4(2): 3
Refinement: Stress sensitive and gastric ulceration models	3(2): 5
The rat as an experimental animal	2(3): 5
The use of animal models to study early changes in liver fibrosis	7(4): 5
The use of FIV infection as an animal model for HIV infection	9(2): 2
Transgenic mice: Probes into complex systems	2(4): 7
US NIH Conference 'Modeling in Biomedical Research', 1989 - Report	4(1): 8

ANIMAL WELFARE

American Veterinary Medical Association animal welfare forum: Enhancing wellness in animals and people—Report	4(3): 5
Animal experiments: the great debate (New Scientist)	5(2): 3
Animal identification systems and their effects on welfare	8(2): 9
Animal welfare in New Zealand — concepts, committees, consultation and codes of practice	10(4): 5
Animal welfare research in Australia and New Zealand: Results of the ANZCCART Survey	6(4): 7
Animal welfare in New Zealand	5(2): 9
Animal welfare law course	5(4): 4
Animal welfare teaching	5(4): 4
Animal welfare: a measure to measure?	4(3): 1
Annotated Bibliography on Laboratory Animal Welfare. SCAW. 1991	5(2): 7
Cognition and its role in assessing animal welfare	8(4): 7
Establishment of a new Animal Welfare	

Centre in Melbourne	10(4): 4
Ethical, moral and welfare implications of embryo manipulation technology	5(3): 6
Information resources	4(2): 4
Information resources	4(3): 5
Laboratory animal welfare. Current bibliographies in medicine	4(3): 5
Marsupials and animal welfare - the issues	8(4): 1
National Consultative Committee on Animal Welfare (NCCAW)	6(2): 10
Neuroscience experiments	4(3): 5
Overview of current research and development activity in animal welfare in the egg industry	8(2): 7
SCAW survey of IACUCs	7(2): 12
The animal rights debate	8(1): 1
The New Zealand Foundation for the Study of the Welfare of Whales	9(1): 4
The Use of Animals in Research Related to Epilepsy and Other Disorders in which Convulsions May Occur. RSPCA UK. 1989	4(1): 10
Welfare journals	5(1): 9
USA Animal Welfare Information Center (AWIC)	10(4): 3
Welfare risks: the 'cut-off point' concept	5(2): 4

ANTIBODY PRODUCTION

Adjuvants and antibody production	9(2): 5
Ascites and alternatives	9(2): 8
CCAC guidelines: Acceptable procedures	3(2): 11
Modular bioreactors	10(4): 8
Modular bioreactors as an alternative to ascitic fluid production of monoclonal antibodies	10(2): 6
Monoclonal antibody production	3(4): 2
Monoclonal antibody production	4(2): 5
Monoclonal antibody production methods	3(2): 6
More on in vitro production of monoclonal antibodies	10(2): 6
Polyclonal antibody production and adjuvants - a dilemma	10(3): 2
Refinement of antibody production	2(4): 3
The impact of adjuvants	7(1): 9

AWARDS

ANZCCART Student Award	7(2): 11
ANZCCART Student Award	8(1): 4
ANZCCART Student Award	9(2): 11
ANZCCART Student Award	10(1): 10
Doerenkamp-Zbinden awards	2(2): 4
Doerenkamp-Zbinden awards	3(4): 11
Doerenkamp-Zbinden awards	4(3): 3
Doerenkamp-Zbinden awards	5(1): 4
Dutch alternatives prize	3(3): 12
Dutch scientist wins Russell and Burch Award	6(4): 10
Marchig animal welfare awards	2(2): 7
NEAMS Trust	5(1): 3
NEAMS Trust	5(2): 4
NEAMS Trust	6(1): 3
NEAMS Trust	6(3): 4
NEAMS Trust	9(3): 10
New Educational Aids in Medicine and Science (NEAMS) Trust	7(3): 7
Russell & Burch award	4(4): 3
Russell and Burch Award	6(2): 12
Russell and Burch Award	8(4): 6
Russell and Burch Award	9(1): 12
Stimulating a new approach to teaching veterinary science - 1996 NEAMS Grant awarded	9(1): 5
UK - Laboratory Animal Welfare Award to Dr Paul Flecknell	7(2): 12

BASIC BIOLOGY

Animal nutrition - just a matter of feeding?	4(2): 1
Animal well-being?	2(4): 8
Biological rhythms	2(1): 7
Environmental enrichment: Advancing animal care. VHS Video	4(1): 9
Nature Conservation: Cost Effective Biological Surveys and Data Analysis. CSIRO. 1991	4(2): 10
Reference values for the koala	2(4): 11
The Biology and Medicine of Rabbits and Rodents. 3rd ed. Lea and Febiger. 1989	2(4): 9
The Clinical Chemistry of Laboratory Animals. Pergamon Press. 1989	2(3): 9
The Molecular Biology of the Major Histocompatibility Complex of Domestic Animal Species. Iowa State Uni. Press. 1988	3(4): 9

BOOK REVIEWS

Animal Consciousness. Prometheus Press. 1989	4(1): 9
Animal Ethics Committees: The Role of the Veterinarian. AVA. 1990	4(3): 9
Animal Experimentation and the Future of Medical Research. Portland Press Ltd	6(2): 7
Animal Experimentation: The Consensus Changes. Macmillan	4(1): 9
Animal Liberation. 2nd ed. Jonathan Cape. 1990	4(2): 9
Animal Liberation: Putting Animals in Perspective. Routledge.	6(4): 5
Animal Training: A Review and Commentary on Current Practice. UFAW. 1990	3(4): 10
Animal Welfare: A Cool Eye Towards Eden. Blackwell Science.	8(4): 9
Animals and Alternatives in Testing: History, Science and Ethics. Jacaranda Wiley.	9(2): 7
Animals in Education: The Facts, Issues and Implications. Richmond Publishers. 1994	10(3): 6
Basic Microsurgical Techniques: A Laboratory Manual. Green and Simpkin. 1988	1(2): 8
Benchmarks: Alternative Methods in Toxicology. Princeton Scientific Publishing. 1989	2(1): 9
Biohazards Management Handbook. Marcel Dekker, Inc. 1989	3(2): 9
Canine Research Environment. SCAW. 1990	3(3): 8
Companion Guide to Infectious Diseases of Mice and Rats. National Academy Press. 1991	5(3): 10
Contemporary Issues in Bioethics. 3rd ed. Mice and Rats. National Academy Press. 1991	5(3): 10
Disturbance Index: Assessing Severity of Procedures on Rodents. UFAW. 1988	2(1): 9
Environmental enrichment: Advancing animal care. VHS Video	4(1): 9
Essentials of Experimental Surgery. Butterworths. 1990	5(2): 6
Euthanasia of Amphibians and Reptiles. UFAW and WSPA. 1989	2(2): 9
Experimental and Surgical Technique in the Rat. Academic Press.	6(2): 7
Experimental Surgery and Physiology: Induced Animal Models of Human Disease. Williams and Wilkins. 1988	2(2): 9
Experimental Tumours in Monkeys. CRC Press.	8(1): 7
Farm Animal Ethology: A Source Book. Captus University Publications. 1989	3(4): 9
Farm Animal Welfare. Social, Bioethical and Research Issues. Iowa State University Press	9(1): 5
Feline and Canine Infectious Diseases. Blackwell Science. 1996.	10(3): 6
Genetic Engineering of Animals. Portland Press. 1990	6(3): 5
Genetic Variants and Strains of the Laboratory Mouse. 2nd ed. Oxford Uni. Press. 1989	3(3): 8
Guidelines for Acquisition, Care and Breeding of Non-human Primates. UFAW. 1989	3(1): 10

Guidelines for the Well-being of Rodents in Research. SCAW. 1990	4(3): 9
Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. Part II. Pain, Analgesia, Anaesthesia. UFAW. 1989	3(3): 10
Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. Part III. Surgical Procedures. UFAW. 1989	3(2): 9
Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. IV. Planning and design of experiments. LASA/UFAW. 1990	4(2): 9
Housing, Care and Psychological Well-being of Captive and Laboratory Primates. Noyes Publications. 1989	2(4): 9
In the Name of Science: Issues in Responsible Animal Experimentation. Oxford University Press.	7(3): 8
Infectious Diseases of Mice and Rats. National Academy Press	5(3): 10
Injection and Blood Collection Techniques in Animals. Earthbound Publishing	4(4): 9
Introduction to Animal Diagnostic Procedures. Earthbound Publishing	4(4): 9
Introduction to Veterinary Anaesthesia and Surgical Nursing. 2nd ed. Earthbound Publishing	4(4): 9
Laboratory Animals: An Introduction for Experimenters. Mary Ann Liebert.	8(3): 11
Lives in the Balance. The Ethics of Using Animals in Biomedical Research. The Report of a Working Party of the Institute of Medical Ethics. OUP. 1991	5(2): 6
Mammals from Pouches and Eggs: Genetics, Breeding and Evolution of Marsupials and Monotremes. CSIRO Australia. 1990	3(4): 10
Orang-utans in Borneo. University of New England. Postmortem Change in the Rat: A Histologic Characterization. Iowa State Uni. Press. 1987	8(3): 10
Primate Responses to Environmental Change. Chapman and Hall.	3(1): 9
Principles of Laboratory Animal Science. Elsevier.	6(1): 9
Problems of Animal Behaviour. Longman. 1989	7(1): 7
Rabbit Feeding and Nutrition. Academic Press. 1987	5(3): 9
Recreational Animal Welfare. AVA. 1989	3(1): 10
Refinement and Rodents: A Report Concerning the Well-being of Laboratory Rodents. Tufts School of Veterinary Medicine. 1991	2(3): 9
Replacement, Reduction and Refinement: Present Possibilities and Future Prospects. Elsevier. 1991	5(3): 11
Review of Induced Pain	5(3): 11
Revue Scientifique et Technique Vol. 13, No. 1	6(3): 11
Risk analysis, animal health and trade. Vol 12, No. 4	7(4): 6
Systemic Pathology of Fish: A Text and Atlas of Comparative Tissue Responses in Diseases of Teleosts. Iowa State University Press. 1989	7(4): 7
The Behaviour of Sheep: Biological Principles and Implications for Production. CSIRO. 1992	4(4): 8
The Biology and Medicine of Rabbits and Rodents. 3rd ed. Lea and Febiger. 1989	5(4): 8
The Brain in Bits and Pieces: In vitro techniques in neurobiology, neuropharmacology and neurotoxicology. MTC Verlag.	2(4): 9
The Care and Use of Amphibians, Reptiles and Fish in Research. SCAW.	8(1): 7
The Clinical Chemistry of Laboratory Animals. Pergamon Press. 1989	6(2): 8
The Experimental Animal in Biomedical Research. Vol 1, 1990. A survey of scientific and ethical issues for investigators. CRC Press.	2(3): 9
The Exploitation of Mammal Populations. Chapman and Hall. 1996.	7(1): 6
The Great Ape Project, Equality Beyond Humanity. Fourth Estate.	10(1): 7
The Human Nature of Birds. Bookman Press	7(2): 7
The Inevitable Bond - Examining Scientist-Animal	9(2): 6

[illegible]

DISEASE

Australian perspectives in veterinary virology	3(3): 5
Bovine spongiform encephalopathy - summary of Australia's revised quarantine policy	8(2): 6
Bovine spongiform encephalopathy (BSE) - the New Zealand View	8(4): 4
Control of rabbits in Australia and New Zealand	6(4): 4
Elimination of pathogens from mice	2(1): 4
Hantaan virus in rodent colonies	2(2): 7
Hantaan virus in rodent colonies	3(3): 5
Laboratory animal diseases	4(4): 4
Synopsis of Zoonoses in Australia. 2nd ed. Dept. Community Services and Health. 1988	3(1): 9
Synopsis of zoonoses in Australia	5(2): 7
Systemic Pathology of Fish: A Text and Atlas of Comparative Tissue Responses in Diseases of Teleosts. Iowa State University Press. 1989	4(4): 8
The contributions of biomedical research to animal health.	2(1): 10
Veterinarians and animals in research	4(3): 5
Well-being of non-human primates in research	5(1): 8

EDITORIAL AND PUBLICATIONS

Animal Experimentation: A Student Guide to Balancing the Issues - another new publication from ANZCCART	9(3): 10
Animals and society - BETA series number 1	7(3): 7
ANZCCART's 1995 Conference Proceedings now available	9(1): 11
Back issues of the Facts Sheets available	9(2): 11
Editorial responsibility: Letters in Nature	3(2): 12
Editorial responsibility: Policy of Nature	2(1): 11
Format and content of ANZCCART News	8(1): 4
Forthcoming ANZCCART publications	9(2): 10
Proceedings of ANZCCART's 1994 Conference	8(2): 8
Publication of Euthanasia monograph by ANZCCART	6(3): 6
Publication of Proceedings of 1993 ANZCCART Conference	7(1): 10
Publications Sale	8(4): 6
Publishing experiments: AJSR policy	1(1): 2
Publishing experiments: GV-SOLAS guidelines	2(1): 7
Revised ILAR Guide published	9(2): 12
UFAW brochure	7(3): 12
USA - New Journal of Applied Animal Welfare Science	8(1): 12

EDUCATION

A course on ethical issues of animal research	7(4): 11
Alternatives and animals used in the life sciences: Education, testing and research. First world congress, 1993	4(4): 9
Alternatives in teaching (respiratory function analysis unit and biovideograph)	3(1): 6
Animal Welfare - a new postgraduate subject at the University of Adelaide	9(4): 11
Animal Welfare course to be offered at the University of Adelaide	7(3): 11
Animal welfare law course	5(4): 4
Animal welfare teaching - survey	5(4): 4
Animals and science education project	5(2): 3
Animals in education	4(2): 6
Animals in research and teaching - educating New Zealand's next generation of researchers	8(3): 4
Animals in Schools: Animal Welfare Guidelines for Teachers. NSW Dept School Education	4(4): 4
Animals, Scientists and You	8(3): 6
Biotechnology with schools project - UK	6(3): 12
Computer-aided learning programs	4(4): 3
Course in laboratory animal science at University of Utrecht	6(4): 12
Course of study: Humanity and animality	4(1): 11
Course of study: Rodent tumours	3(2): 5

Courses: Applied animal behaviour and welfare	3(2): 7
Dissecting animals in schools	6(4): 9
Dissection and the Use of Animals in Schools. Australian Science Teachers Journal 1990	4(4): 4
Education in New Zealand schools about the use of animals in research	6(2): 2
Educational initiatives in Australia	2(1): 8
Ethical education in The Netherlands	2(4): 6
Ethics course, 1990	3(4): 12
Guidelines for the Care and Use of Animals in ACT Schools. ACT Dept Health, Education, Arts, Canberra. 1991	4(4): 4
How computers can reduce the use of animals in the teaching of veterinary anatomy and research	7(3): 3
Injection and Blood Collection Techniques in Animals. Earthbound Publishing	4(4): 9
Instructional design	2(2): 9
International course on laboratory animal science - Utrecht	9(4): 12
International course on laboratory animal science to be held in Utrecht	8(4): 11
International course on laboratory animal science - Utrecht, June 8-19, 1998	10(3): 12
Introduction to Animal Diagnostic Procedures. Earthbound Publishing	4(4): 9
Introduction to Veterinary Anaesthesia and Surgical Nursing. 2nd ed. Earthbound Publishing	4(4): 9
Invertebrate Learning: A Laboratory Manual and Source Book. APA	5(1): 2
Learning about pet ownership in primary school	8(3): 8
Motives underlying attitudes toward the use of animals in teaching	6(3): 1
Murdoch University course in animal welfare	2(2): 4
National curriculum in animal care	2(3): 4
National curriculum in animal care	3(3): 11
National developments in Australian school science curriculum	8(3): 5
New course in care and culture of animals	8(1): 9
Pathology training	4(2): 12
Principles and guidelines for the use of animals in precollege education	2(4): 5
Public education	1(1): 2
Reduction of the use of animals in teaching	2(2): 5
Royal Veterinary College course	3(1): 12
Science teaching: audio-visual alternatives	1(2): 6
Science teaching: audio-visual alternatives	3(4): 8
Some guidelines for animal use in schools	8(3): 7
Stepping into the classroom: the NHMRC's Animal Welfare Committee	6(2): 1
Supervision of Technical Staff: An Introduction for Line Supervisors. Royal Society of Chemistry 1989	3(2): 10
Teaching animal care in New Zealand schools	5(4): 10
The ACTRAC National Laboratory Science Technician Project	6(2): 11
The rat stack	4(2): 5
Training courses: Scientific and technical staff	3(4): 8
UFAW education publications	2(1): 7
UK education guidelines and EURONICHE	2(3): 10
Use of animals in education: Policy and Practice in the United States	4(4): 4

ETHICS

ACCART 1992 Conference: Effective animal experimentation ethics committees	5(2): 10
AEEC Newsletter. NHMRC	5(1): 11
An ethic of animal experimentation	2(1): 5
Animal care committees - the Canadian view	5(4): 12
Animal Ethics Committees: The Role of the Veterinarian. AVA. 1990	4(3): 9
Animal ethics training of staff and students by universities	6(4): 2
Animal Experimentation: Ethical, Scientific and Legal Perspectives. Uni. NSW. 1988	1(1): 5

Animal Liberation. 2nd ed. Jonathan Cape. 1990	4(2): 9
Animal Research and Ethical Conflict: An Analysis of the Scientific Literature, 1966-1986. Springer-Verlag. 1989	2(4): 10
Animal rights and wrongs	5(1): 3
Animal rights. Special issue: The Monist, 1987	1(1): 5
Animal rights: Human wrongs	3(3): 6
Animals and People Sharing the World. University Press of New England. 1988	1(2): 10
Animals and science education project	5(2): 3
Animals in research. Special issue: J. Med. Phil. 1988	2(1): 10
Animals in science: ethics, obligations and ANZCCART	6(1): 1
Animals, science and ethics. Hastings Center Report Supplement. 1990	3(4): 10
Australian AEECs 1987-89: Protection for animals in biomedical research. NHMRC Bioethics '87 symposium proceedings.	5(1): 11
Special issue: Appl. Anim. Behav. Sci. 1988.	2(1): 10
Bioethics '89: New deal for research animals?	2(1): 12
Biophotography ethics	4(3): 3
CCAC workshop 1992, Animal care committees: role and responsibilities - Report	5(2): 12
Contemporary Issues in Bioethics. 3rd ed. Wadsworth Publishing Company. 1989	3(3): 9
Ethical Issues of Animal Research - a course held by the Kennedy Institute of Ethics, Georgetown University, Washington DC, USA, 24-29 June, 1995	8(4): 4
Ethical scores for animal experiments?	5(4): 7
Ethical standards: Export of research/testing	1(2): 4
Ethical use of live animals	8(3): 1
Ethical, moral and welfare implications of embryo manipulation technology	5(3): 6
Ethics and intellectual property. Monash Centre for Bioethics	5(2): 7
Ethics course, 1990	3(4): 12
Institutional animal experimentation ethics committees	5(3): 3
Professor Peter Singer: Equal consideration of interests	3(4): 10
Science and Animals: Addressing Contemporary Issues. SCAW. 1989	1(2): 9
Taking the Pressure Off: What we can do to reduce animal experiments. RSPCA. 1989	2(1): 5
The moral standing of insects	3(4): 10
The moral status of mice	2(2): 6
The public debate: Confrontation or dialogue?	3(3): 1
The question of necessity	4(1): 1
The Status of Animals: Ethics, Education and Welfare. CAB International. 1989	3(3): 10
The study of chronic pain: Ethical and scientific dilemmas	3(1): 7
The Use and Welfare of Experimental Animals. R. Soc. N.Z. 1989	4(4): 8
UK Institute of Medical Ethics Conference - The ethics of using animals in biomedical research	4(1): 11
Uneasiness	4(3): 4
US Ethics Institute	4(4): 12
Uses of Laboratory Animals in Biomedical and Behavioral Research. Nat. Acad. Press. 1988	1(2): 12
Veterinary Ethics. Williams and Wilkins. 1989	2(1): 9
What do animals think and feel?	7(4): 1
With our heads and our hearts	4(4): 2

EUTHANASIA

1993 Report of the AVMA panel on euthanasia	6(2): 3
Euthanasia of Amphibians and Reptiles. UFAW and WSPA. 1989	2(2): 9
Rodent euthanasia	4(2): 3
Euthanasia of Animals Used for Scientific Purposes. ANZCCART 1993.	6(3): 6

FACTS SHEETS

Australian Marsupials	8(4): insert
Experimental Techniques and Anaesthesia in the Rat and Mouse	7(1): insert
In vitro and Other Non-animal Experiments in the Biomedical Sciences	9(4): insert
Restraint and Handling of Captive Wildlife	9(1): insert
The Common Marmoset	7(2): insert
The Dog as an Experimental Animal	10(1): insert
The Domestic Chicken	9(2): insert
The Guinea Pig	7(3): insert
The Laboratory Cat	8(1): insert
The Laboratory Rabbit	7(4): insert
The Mouse (part 1 of 2 parts)	6(2): insert
The Mouse (part 2 of 2 parts)	6(3): insert
The Rat	6(4): insert
The Sheep	8(2): insert
Variables in Animal-Based Research: Part 1. Phenotypic Variability in Experimental Animals	10(3): insert

FARM ANIMALS

Farm Animal Ethology: A Source Book. Captus University Publications. 1989	3(4): 9
Farm animal housing	4(1): 10
Farm Animals Handbook. UFAW. 1988	1(2): 4
Humane slaughter of farm animals	4(1): 2
Improving Genetic Disease Resistance in Farm Animals. Kluwer. 1989	3(1): 10
SCAW agricultural animals conference, 1990	3(3): 12
SSCAW intensive housing of livestock report	3(3): 6
SSCAW sheep husbandry report	2(3): 6
The Behaviour of Sheep: Biological Principles and Implications for Production. CSIRO. 1992	5(4): 8
The use of animals in agricultural research	8(2): 1
The use of pigs for research with examples of research on housing and handling	10(2): 1
The well-being of agricultural animals in biomedical and agricultural research. SCAW. 1991	4(1): 10
Towards Non-surgical mulesing of sheep	5(1): 11
Training Cattle for Scientific Experiments. CSIRO Tropical Animal Production 1991	5(1): 9
UFAW and SCAW publications on welfare of agricultural animals	8(2): 5
UK - Welfare of farm animals	7(1): 12

GENETIC ENGINEERING

Development of guidelines for small scale genetic manipulation work. Aust. J. Biotechnol. 1991	4(2): 10
Ethical, moral and welfare implications of embryo manipulation technology	5(3): 6
Genetic Manipulation Advisory Committee	3(2): 10
Genetic manipulation and animal research: the parliamentary committee's report	5(2): 1
Genetic technologies: issues for Australia	7(2): 2
House of Representatives inquiry	3(3): 5
Impact of activist pressures on R-DNA research	4(3): 2
Livestock references	2(4): 11
Patenting transgenics	4(2): 3
Transgenesis and livestock production	8(2): 4
Transgenic mice: Probes into complex systems	2(4): 7
Vic. Law Reform Comm. discussion paper, 1987	1(1): 5
Vic. Law Reform Commission report, 1989	2(3): 1

GUIDELINES

AFRC Guidelines on the Use of Animals in Research	5(3): 12
Animal ethics committees: A matter of judgement	1(2): 1
Animal ethics committees: The role of the veterinarian. AVA. 1990	3(1): 6
Animal experimentation in Antarctica: revision of	

guidelines	4(3): 3	Draft National Animal Welfare Bill tabled in the Senate	9(1): 1
Animals in Schools: Animal Welfare Guidelines for Teachers. NSW Dept School Education	4(4): 4	European legislative control of animal experiments	9(4): 10
CCAC guidelines: Immunological procedures	3(2): 11	Germany - Animal Protection Act	7(1): 12
Checklist: Design and review of proposals	1(2): 3	Germany's changes to legislation on genetically engineered organisms	6(3): 12
Development of guidelines for small scale genetic manipulation work. Aust. J. Biotechnol. 1991	4(2): 10	Harmonisation of Animal Experimentation Legislation	6(3): 12
Ethical guidelines for students in laboratory classes involving the use of animals or animal tissues	7(4): 3	Implementation of NSW legislation	3(3): 3
Ethical guidelines for wildlife parasitologists	8(4): 3	Legal protection for the octopus	6(4): 7
Field Research Guidelines: Impact on Animal Care and Use Committees. SCAW. 1988	1(1): 3	Legislative developments (ACT, Qld)	1(2): 4
Guidelines for blood sampling and animal transport	6(2): 4	New Animal Welfare Act for Western Australia	7(1): 11
Guidelines for the Care and Use of Animals in ACT Schools. ACT Dept Health, Education, Arts, Canberra. 1991	4(2): 11	NZ legal requirements	5(3): 4
Guidelines for the Care and Use of Animals in ACT Schools. ACT Dept Health, Education, Arts, Canberra. 1991	4(4): 4	Queensland legislative changes	4(3): 3
Guidelines for the Evaluation of Chemicals for Carcinogenicity. MHSO, London. 1991	5(4): 9	Report: UK animal procedures committee. 1987	2(1): 12
Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. IV. Planning and Design of Experiments. LASA/UFAW. 1990	4(2): 9	State/Territory legislation compared	1(1): 5
Guidelines on the Handling and Training of Laboratory Animals. UFAW	5(2): 12	Swiss guidelines for use of animals in research	5(4): 12
Institutional Animal Care and Use Committee Guidebook. US Dept Health and Human Services	5(3): 12	US Animal Welfare Act	7(3): 12
NSW TAFE guidelines for the use of animals	7(2): 9	USA - Animal Enterprise Protection Act	6(1): 12
OECD Test Guidelines Programme	8(2): 12		
Some guidelines for animal use in schools	8(3): 9		
Swiss guidelines for use of animals in research	5(4): 12		
The assessment and control of the severity of procedures on laboratory animals	3(3): 7		
UFAW Handbook on the Care and Management of Laboratory Animals. Longman. 1987	1(1): 5		
Venepuncture	3(4): 3		
Wolfson Foundation applicants guidelines	6(2): 12		
		LETTERS	
		Access to dogs for teaching purposes	10(3): 7
		AWIC services in Australia and New Zealand	10(1): 8
		Blood samples from rats by venipuncture	10(1): 8
		Ethics for invertebrates?	9(4): 6
		How many is just right? Getting the correct number	
		"n": apoint for consideration for ethics committees	10(2): 8
		Induction of diabetes in experimental animals with streptozotocin	9(4): 7
		Intraperitoneal injection of sodium pentobarbitone as a method of euthanasia for rodents	10(4): 8
		Laboratory animal use in practical classes	10(3): 7
		Lay descriptions in ethics applications	10(3): 7
		Light on the subject of lay descriptions	10(3): 8
		Modular bioreactors	10(4): 8
		Standard Operating Procedures (SOPs)	10(2): 7
		The point of lay descriptions	10(2): 6
		The use of animals in schools	9(1): 8
		Use of anaesthetic ether in the rat	9(1): 6
		NUTRITION	
		Animal nutrition - just a matter of feeding?	4(2): 1
		National diet survey, 1989	3(3): 5
		Nutrient requirements of laboratory animals	5(1): 8
		Nutrition Society conference, 1989	2(2): 7
		Rabbit Feeding and Nutrition. Academic Press. 1987	3(1): 9
		ORGANISATIONS/PERSONS	
		Adams, Jim	4(4): 2
		AFWA to be wound up	8(1): 5
		Animal Transportation Association Inc.	4(1): 12
		Animal Welfare Information Center	1(2): 2
		Animals in Schools Education Trust	8(3): 7
		Australian Federation for the Welfare of Animals	2(2): 11
		Australasian Wildlife Management Society	4(1): 4
		Australian Animal Technicians' Association (AATA)	5(2): 11
		Australian Fish Health Reference Laboratory	3(3): 11
		Australian Koala Foundation	1(2): 10
		Australian Science Communicators	8(3): 7
		Australian Society for Laboratory Animal Science (ASLAS)	5(4): 4
		Biotechnology Information Center	2(3): 11
		Boisvert, Donald (CCAC)	5(2): 12
		Burch, Rex, Death of	9(3): 12
		BVA Animal Welfare Foundation	4(3): 12
		CABSAE - The Committee of Australian Biomedical Societies for Animal Experimentation	6(3): 3
		Canadian Center for the Study of Animal Welfare	4(3): 12
		Canadian Council on Animal Care (CCAC)	4(4): 12
		Center for Alternatives to Animal Testing (CAAT)	1(2): 8
		Center for Alternatives to Animal Testing (CAAT)	6(2): 4
		Centre for Study of Animal Affairs	1(1): 6
HOUSING			
Animal accommodation: Is bigger better?	3(1): 8		
Assessing the impact of husbandry practices - a check list	7(2): 5		
Cage cleaning: Frequency?	2(4): 7		
Dogs - housing and behaviour	6(1): 4		
Enrichment - past and future	7(1): 4		
Environmental enrichment: Advancing animal care. VHS video	4(1): 9		
Farm animal housing	4(1): 10		
Government's response to SSCAW intensive housing of livestock report	4(3): 6		
Implementation strategies for research animal well-being: institutional compliance with regulations - Conference proceedings. SCAW/WARDS	5(4): 9		
Intensive housing of livestock: SSCAW report	3(3): 6		
Monkey housing: a room, a tree and a puzzle	5(1): 1		
Rat caging	1(2): 11		
Refinements in rabbit husbandry	6(4): 4		
The use of pigs for research with examples of research on housing and handling	10(2): 1		
INVERTEBRATES			
Ethics for invertebrates	9(4): 6		
Handbook on the Care and Management of Cephalopods in the Laboratory. UFAW. 1991	4(2): 11		
Pain in invertebrates	5(1): 10		
Snails	5(1): 2		
LEGISLATION			
Amendments to NSW legislation	2(1): 5		
Animal experimentation in France	5(4): 12		
Animal Welfare legislation and transport	7(3): 1		

ECVAM - European Centre for the Validation of Alternative Methods	6(4): 12	PAIN / ANAESTHESIA / ANALGESIA	
FRAME's 25th anniversary	3(3): 12	ACCART 1990 conference proceedings—	
FRG Central Institute for Laboratory Animal Breeding (ZfV)—1990 Annual Report	5(1): 12	Animal Pain: Ethical and Scientific Perspectives	5(2): 11
Fund for Replacement of Animals in Medical Experiments	3(2): 12	ACCART 1990 conference: The ethical and scientific perspectives of animal pain	3(1): 11
Genetic Manipulation Advisory Committee	3(2): 10	Alleviating animal pain and distress	1(1): 3
Hau, Jann	4(4): 12	Analgesia in rabbits and rodents	5(2): 8
Institute of Laboratory Animals Resources (ILAR)	5(4): 3	Animal well-being?	2(4): 8
Institute of Medical Ethics	4(1): 12	Assessment and relief of pain	5(2): 5
International Council for Lab. Animal Science	3(4): 12	Assessment of animal stress	3(4): 5
International Foundation for Ethical Research	2(3): 12	Disturbance Index: Assessing Severity of Procedures on Rodents. UFAW. 1988	2(1): 9
Italian Committee for Laboratory Animal Science (CISAL)	4(4): 12	Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. Part II. Pain, Analgesia, Anaesthesia. UFAW. 1989	3(3): 10
IUIS Adjuvants Group	4(1): 12	Induction of tumours	1(2): 4
James, A E	5(2): 11	Intraperitoneal injection of sodium pentobarbitone as a method of euthanasia in rodents	10(4): 8
Japanese Society for Alternatives to Animal Experiments (JSAEE)	5(1): 12	Introduction to Veterinary Anaesthesia and Surgical Nursing. 2nd ed. Earthbound Publishing	4(4): 9
Johnston, Noel	4(4): 2	Laboratory Animal Anaesthesia: An Introduction for Research Workers and Technicians. Academic Press. 1987	1(2): 5
Joseph F Morgan Research Foundation	4(1): 12	Non-human primate analgesia	5(2): 8
Kelly, Deborah	5(4): 5	Pain and distress in animals	2(1): 3
Krulisch, L (SCAW Executive Director)	2(3): 12	Pain in animals. Special issue: Bioethics	2(4): 2
Laboratory Animal Management Association (LAMA)	4(4): 12	Pain in birds	6(1): 6
Morton, Professor David, visit to Australia	10(2): 10	Pain, anesthesia and analgesia in common laboratory animals	5(2): 8
NAEAC Annual Report	10(3): 11	Philosophical approaches to pain and suffering	4(4): 5
National Consultative Committee on Animal Welfare	2(4): 1	Post-operative Pain Control. Blackwell. 1987	4(2): 11
NCCAW	4(4): 10	Symposium: Animal pain and its control, 1990	3(1): 8
NCCAW	5(3): 8	The assessment and control of the severity of procedures on laboratory animals	3(3): 7
NEAMS Trust	5(1): 3	The assessment of depth of anaesthesia in animals and man	5(4): 10
NEAMS Trust	5(2): 4	The language of pain	2(3): 5
New Chair in Animal Welfare Science at Massey University	7(2): 10	The problems of pain: concepts and issues	9(4): 2
New Scientific Director for FRAME	7(2): 12	The relief of pain in cold-blooded vertebrates	3(1): 1
New Zealand Animal Welfare Advisory Committee (AWAC)	9(3): 11	The study of chronic pain: Ethical and scientific dilemmas	3(1): 7
NIH Office for Protection from Research Risks	6(1): 12	The Unheeded Cry: Animal Consciousness, Animal Pain and Science. OUP. 1989	2(3): 9
NZ National Animal Ethics Advisory Committee	1(2): 12	The Use and Welfare of Experimental Animals. Royal Society of New Zealand 1989	4(4): 8
NZ National Committees	2(4): 12	The use of non-steroidal anti-inflammatory drugs for the relief of pain in laboratory rodents and rabbits	6(1): 6
Office of Animal Care and Use	1(1): 6	Ways of minimising pain and distress in animals in research. NHMRC	5(1): 11
Professor David Morton visits Australia	10(4): 7		
Radcliffe, John, Institute of Plant Production and Processing	6(1): 3	PRIMATES	
Reid, Cam, Obituary:	9(3): 11	Canada - Monkey Neurovirulence Test	6(4): 12
Rowse, Harry	4(4): 12	Guidelines for Acquisition, Care and Breeding of Non-human Primates. UFAW. 1989	3(1): 10
RSPCA anniversary	4(4): 3	Housing, Care and Psychological Well-being of Captive and Laboratory Primates. Noyes Publications. 1989	2(4): 9
Schofield, John	4(4): 12	Implementation strategies for research animal well-being: institutional compliance with regulations - Conference proceedings. SCAW/WARDS	5(4): 9
Science and Health	7(1): 12	Laboratory Animal Welfare Research: Primates. UFAW. 1989	2(4): 9
Scottish Centre for Animal Welfare Sciences	5(2): 12	Monkey housing: a room, a tree and a puzzle	5(1): 1
Senate Standing Committee on Rural and Regional Affairs	4(4): 2	Non-human primate analgesia	5(2): 8
Singer, Peter	3(4): 11	Non-human primate colonies in Australia	5(3): 9
Smith, John Beaupre, obituary	6(1): 9	Primate centre, Rijswijk, The Netherlands	6(2): 12
Spira, Henry	2(1): 4	Through the looking glass: Issues of psychological well-being in captive non-human primates. APA	5(1): 2
Thorburn, Geoffrey Donald, obituary	10(1): 11	UK - Primates in research	8(1): 12
Tufts Center for Animals and Public Policy	2(4): 12		
Tufts Center for Animals and Public Policy	3(1): 12		
UFAW appointments	4(2): 12		
UFAW Director to retire	9(1): 12		
UFAW Hume Fellowship in Animal Welfare	6(4): 3		
UK Animal Welfare Foundation	5(1): 12		
Universities Federation for Animal Welfare (UFAW)	2(2): 12		
US Ethics Institute	4(4): 12		
US Institute of Laboratory Animal Resources (ILAR)	1(2): 12		
US National Library of Medicine (NLM)	2(2): 12		
Valediction, D. Daly	5(1): 4		
Veterinary Invertebrate Society	5(1): 12		
What is SCAW?	8(4): 12		
Wolfe, Thomas (ILAR Director)	1(2): 12		
Working for Animals Used in Research, Drugs and Surgery (WARDS)	4(3): 12		
Zbinden, Gerhard, Death of	7(1): 12		

RECENTLY PUBLISHED

- A review of the welfare aspects of layer-hen housing in Australia 8(2): 8
- A Salute to World Deer Farming. 7(2): 9
- Advances in Veterinary Anaesthesia. Univ. Queensland 4(3): 11
- Agrochemicals Handbook. UK R. Soc. Chemistry. 1991 4(3): 10
- Alternative Methods in Toxicology. Vol. 8. Mary Ann Liebert Inc. 5(1): 8
- Alternatives Bibliography (NLM/ILAR) 3(4): 11
- Alternatives to animal experiments in risk assessment. Berlin Soc. Opponents 1(2): 11
- Animal Experiments and Schering, A.G. 1988 1(1): 4
- Alternatives to animal use in research, testing and education. US Congress. 1986 6(2): 5
- Alternatives to the Use of Mammals for Pain Research. Life Sciences. 2(4): 10
- An ethologist's approach to behavioral toxicology. Neurotoxicol. Teratol. 1988. 6(2): 6
- An Introductory Biology of Amphibians and Reptiles. Smithsonian Institution Press 3(1): 6
- Animal Ethics Committees: The Role of the Veterinarian. AVA. 1990 1(1): 5
- Animal Ethics Committees: Their Structure, Function and Ethical Dimension. ASLAS. 1988 1(1): 5
- Animal Experimentation: Ethical, Scientific and Legal Perspectives. Uni. NSW. 1988 8(2): 8
- Animal husbandry and technology 10(3): 10
- Animal laboratory exercises in medical school curricula. Alternatives to Laboratory Animals. 1996 4(3): 10
- Animal Models in AIDS. Elsevier. 1990 2(4): 10
- Animal Research and Ethical Conflict: An Analysis of the Scientific Literature, 1966-1986. Springer-Verlag. 1989 1(1): 5
- Animal rights. Special issue: The Monist. 1987 7(3): 10
- Animal Welfare - can science help us? 7(3): 10
- Animal Welfare in New Zealand 8(2): 8
- Animal welfare research in the pig industry 5(1): 8
- Animals and Alternatives in Toxicology: Present Status and Future Prospects. Macmillan. 1991 1(2): 10
- Animals and People Sharing the World. University Press of New England. 1988 2(1): 10
- Animals in research. Special issue: J. Med. Phil. 1988 3(4): 11
- Animals, science and ethics. Hastings Center Report Supplement. 1990 7(4): 8
- Animals, Scientists and You. 5(2): 7
- Annotated Bibliography on Laboratory Animal Welfare. SCAW. 1991 2(2): 11
- ASLAS 1988 conference proceedings 6(1): 5
- Australian Marsupials and Monotremes - An Action Plan for their Conservation. World Wide Fund for Nature. 1993 3(3): 5
- Australian perspectives in veterinary virology. Aust. Vet. J. 1989 6(2): 5
- Australian Veterinary Association (AVA) Member's Directory and Policy Compendium. Bioethics '87 symposium proceedings. 2(1): 10
- Special issue: Appl. Anim. Behav. Sci. 1988. 2(1): 12
- Bioethics '89: New deal for research animals? Biotechnology of Algae: A Bibliography. USDA, NAL. 6(2): 6
- Biotransformations: A Survey of the Biotransformations of Drugs and Chemicals in Animals. Royal Society of Chemistry. 1989 4(1): 10
- Canadian Council on Animal Care documents 3(1): 10
- Comparative Medicine: Animal Models in Biomedical Research. Academic Press 5(2): 7
- Computer-based Learning Programs in Biological Sciences 6(4): 6
- Conservation Biology and the Preservation of Biodiversity in Australia: A Role for Zoos and the Veterinary Profession. Aust. Vet. J. 1997 10(3): 9
- Current Bibliographies in Medicine: Laboratory Animal Welfare 6(3): 6
- Development of Guidelines for Small Scale Genetic Manipulation Work. Aust. J. Biotechnol. 1991 4(2): 10
- Dictionary of Substances and their Effects 5(4): 9
- Dissection of animals in secondary schools 8(3): 10
- ECVAM Workshop Proceedings: Monoclonal Antibody Production. 10(2): 6
- Ethics and Intellectual Property. Monash Centre for Bioethics 5(2): 7
- European Directory of Agrochemical Products. UK R. Soc. Chemistry. 1990 4(3): 10
- Euthanasia update 7(3): 10
- Farm Animal Housing. Vet. Rec. 4(1): 10
- Farm Animals Handbook. UFAW. 1988 1(2): 4
- Fat Rats and Carcinogenesis Screening. Nature. 1997 10(3): 10
- Ferrets as Laboratory Animals: A Bibliography. Nat. Agric. Lib., USA. 1991. 5(1): 8
- Genetic Manipulation. Victorian Law Reform Commission. 1989 2(3): 1
- Genetic Monitoring of Inbred Strains of Rats: A Manual on Colony Management, Basic Monitoring Techniques and Genetic Variants of the Laboratory Rat 5(1): 9
- Guidelines for Acquisition, Care and Breeding of Non-human Primates. UFAW. 1989 3(1): 10
- Guidelines for the Care and Use of Animals in ACT Schools. ACT Dept Health, Education, Arts, Canberra. 1991 4(2): 11
- Guidelines for the Evaluation of Chemicals for Carcinogenicity. MHSO, London. 1991 5(4): 9
- Guidelines for the Well-being of Rodents in Research. SCAW. 1989 3(1): 10
- Handbook: Animal Models of Human Disease ILAR Journal 7(2): 9
- Immunodeficient rodents 9(1): 10
- Impact of the 1993 mouse plague 3(2): 5
- Implementation Strategies for Research Animal Well-being: Institutional Compliance with Regulations - Conference proceedings. SCAW/WARDS 8(2): 8
- Improving Genetic Disease Resistance in Farm Animals. Kluwer. 1989 5(4): 9
- Institutional Animal Care and Use Committees (IACUCS). Lab Animal. 1997 3(1): 10
- In vitro monoclonal antibody production 10(3): 10
- Individual differences in temperament of domestic animals: A review of methodology. 8(1): 9
- International Directory of Primatology 6(3): 6
- Investigating Vertebrates. Massey University, New Zealand. 1997 6(2): 5
- Laboratory Animal Anaesthesia: An Introduction for Research Workers and Technicians. Academic Press. 1987 10(2): 9
- Laboratory Animal Handbook 11: Technical Procedures in Reproduction Toxicology. Royal Society of Medicine Services Ltd for Laboratory Animals Ltd. 1990 1(2): 5
- Laboratory Animal Welfare Research: Primates. UFAW. 1989 4(1): 10
- Modified Cages for Layer Hens. 2(4): 9
- Mouse Management. Univ. Melbourne. 1991. 7(4): 9
- Nature Conservation: Cost Effective Biological Surveys and Data Analysis. CSIRO. 1991 5(1): 9
- NAEAC 1996 Annual Report 4(2): 10
- New ANZCCART publications 10(3): 11
- New publications by RSPCA (UK) 7(3): 9
- New publications from the European Commission 7(4): 8
- New publications from UFAW 7(3): 9
- New Zealand Animal Welfare Advisory Committee Report for 1991 and 1992 7(4): 8
- 6(2): 6

NLM resources in veterinary medicine	2(2): 12	UFAW Handbook on the Care and Management of Cephalopods in the Laboratory. UFAW. 1991	4(2): 11
NSW Agriculture publications	8(1): 9	UFAW Handbook on the Care and Management of Laboratory Animals. Longman. 1987	1(1): 5
Ostrich farming. M. Hastings. 1991	4(3): 11	UFAW Proceedings on Veterinary Behavioural Medicine. UFAW. 1997	10(2): 9
Pain in animals. Special issue: Bioethics	2(4): 2	UK code of practice for the housing and care of animals used in scientific procedures. 1987	2(1): 12
Post-operative Pain Control. Blackwell. 1987	4(2): 11	US National Agricultural Library bibliographies	3(1): 10
Proceedings of the first National AVASE Conference	6(3): 6	Uses of Laboratory Animals in Biomedical and Behavioral Research. Nat. Acad. Press. 1988	1(2): 12
Proceedings of the fourth European symposium on poultry welfare. UFAW	7(1): 9	Views of animal rights advocates and their opponents	8(1): 8
Proceedings of the Second CTFA Ocular Safety Testing Workshop: Evaluation of in vitro Alternatives. CTFA	5(1): 8	What the animal welfare movement expects of the veterinarian. Br. Vet. Assoc. 1987	2(1): 11
Proceedings of the Second World Congress on Alternatives and Animal Use in the Life Sciences. Elsevier Press. 1997.	10(3): 10		
Psy ETA notebook	3(4): 11		
Rabbit Calicivirus Disease (RCD)	7(4): 9		
Refinement and Reduction in Animal Testing - Conference proceedings. SCAW	5(4): 9		
Refresher Course on Veterinary Anaesthesia. Univ. Queensland.	4(3): 11		
Report: UK animal procedures committee. 1987	2(1): 12		
Rescue and Rehabilitation of Oiled Birds - A Field Manual. Zoological Parks Board of NSW	6(2): 6		
Resource guide to aquaculture information	8(1): 9		
Review of Animal Care Programs. Contemporary Topics in Laboratory Animal Science	6(3): 7		
Review of interspecies risk comparisons. Regul. Toxicol. Pharmacol. 1988	2(4): 10		
Reviews from Laboratory Animals	7(4): 9		
SCA Technical Report Series: Model for the Welfare of Animals. CSIRO	4(2): 11		
Science and animals: Addressing contemporary issues. SCAW. 1989	1(2): 9		
Sharks and Rays of Australia. CSIRO	4(3): 10		
Statistical Evaluation of Mutagenicity Test Data. Cambridge. 1989	4(3): 11		
Supervision of technical staff: An introduction for line supervisors. Royal Soc. Chem. 1989	3(2): 10		
Symposium: The Use of Animals in Neuroscience Research. Pergamon Press.	7(2): 9		
Synopsis of Zoonoses in Australia. 2nd ed. Dept. Community Services and Health. 1988	3(1): 9		
Synopsis of Zoonoses in Australia. Post-grad. Com. in Vet. Sci., Univ. Sydney	5(2): 7		
The Detection and Control of Fear in Animals. Br. Vet. Assoc.	4(2): 11		
The Developing Marsupial: Models for Biomedical Research. Springer-Verlag. 1988	5(2): 7		
The Human / Research Animal Relationship. SCAW 1997	10(2): 9		
The Experimental Animal in Biomedical Research. Vol. 1: A Survey of Scientific and Ethical Issues for Investigators. CRC Press. 1990	4(2): 10		
The importance of animals in biomedical research. Perspectives Biol. Med. 1987	2(1): 10		
The Legal Status of Animals. Environmental and Planning Law.	6(3): 7		
The Moribund State as an Experimental Endpoint. Contemporary Topics in Laboratory Animal Science. 1997	10(3): 10		
The Murray. Murray-Darling Basin Commission. 1991	4(3): 10		
The three Rs revisited (again)	8(1): 8		
The Use of Animals in Research Related to Epilepsy and Other Disorders in which Convulsions May Occur. RSPCA UK. 1989	4(1): 10		
The Well-being of Agricultural Animals in Biomedical and Agricultural Research. SCAW. 1991	4(1): 10		
Training Cattle for Scientific Experiments. CSIRO Trop. Anim. Prod. 1991	5(1): 9		
Transgenic Animals as Human Disease Models. Lab. Animal Science. 1997	10(2): 9		
Transgenic Fish Research: A Bibliography	6(4): 6		
Using the Internet. Lab Animal. 1997	10(2): 9		
		REDUCTION / REFINEMENT / REPLACEMENT	
		Alternatives and animals used in the life sciences: Education, testing and research. First World Congress. 1993	4(4): 9
		Alternatives bibliography (NLM/ILAR)	3(4): 11
		Alternatives in teaching (respiratory function analysis unit and biovideograph)	3(1): 6
		Alternatives to animal use in research, testing and education. US Congress. 1986	1(1): 4
		Alternatives to the use of animals in teaching	5(2): 9
		An International Directory of Funding Sources for the three R Alternatives	8(4): 11
		Animal Experimentation: The Consensus Changes. Macmillan	4(1): 9
		Animal nutrition - just a matter of feeding?	4(2): 1
		ATLA alternatives bibliographies	1(2): 8
		Background paper: Strategies for minimising the numbers of animals used in research projects. NHMRC	4(2): 2
		Bibliography on alternatives to the use of live vertebrates in biomedical research and testing. NLM	4(2): 12
		CAAT calls for research proposals	8(4): 10
		CAAT/ERGATT validation of toxicity test procedures workshop. 1990	4(1): 6
		Canada - alternatives' research	7(4): 12
		CEC/FRAME validated non-animal toxicity test procedures workshop. 1990	4(1): 7
		Chemical data base development	4(1): 6
		Computer-aided learning programs	4(4): 3
		Computers to reduce animal experiments in pharmacology	5(1): 2
		Experimental animal use in Canada falls	8(1): 12
		In pursuit of refinement: achievements and frustrations	6(3): 1
		Introductory guide to minimising the numbers of animals used in research. NHMRC	4(2): 2
		Japanese Society for Alternatives to Animal Experiments (JSAAE)	5(1): 12
		More about statistical techniques for experimental design	9(3): 8
		New service available for database searching (Scientific Information Services)	10(3): 11
		NMR probes developed by University of Queensland	6(3): 8
		NORINA: A Norwegian Inventory of Audiovisuals	6(4): 12
		NORINA: A Norwegian Inventory of Audiovisuals	8(2): 12
		Reducing animal use: sequential sampling techniques	9(3): 6
		Reducing the number of rabbits in the Low Volume Eye Test	6(1): 5
		Reduction of the use of animals in teaching	2(2): 5
		Refinement and reduction in animal testing - Conference proceedings. SCAW	5(4): 9
		Refinement and rodents: A report concerning the well-being of laboratory rodents. Tufts School of Veterinary Medicine. 1991	5(3): 11
		Refinement of antibody production	2(4): 3
		Refinement of research animals usage	2(1): 1

Refinement: Initiatives to modify procedures	2(3): 8
Refinement: Stress sensitive and gastric ulceration models	3(2): 5
Replacement, Reduction and Refinement: Present Possibilities and Future Prospects. Elsevier. 1991	5(3): 11
Replacing animal toxicity tests: the challenge of the 1990s	4(1): 6
Research to reduce the number and severity of experiments on living animals	4(1): 12
Russell and Burch revisited	5(4): 1
Science teaching: audio-visual alternatives	1(2): 6
Science teaching: audio-visual alternatives	3(4): 8
Scientific procedures on living animals in Great Britain in 1991	6(1): 12
Statistics - are expectations too great?	7(2): 1
Survey: Replacement of the use of animals in undergraduate teaching	5(2): 9
Survey: Replacement of the use of animals in undergraduate teaching	5(4): 10
The alternatives report	4(2): 12
The Principles of Humane Experimental Technique. Special Edition. UFAW. 1992	5(2): 12
The Principles of Humane Experimental Technique. Special edition. UFAW. 1992	5(4): 7
The Three Rs revisited (again)	8(1): 8
The question of necessity	4(1): 1
The rat stack (computer aided learning program)	4(2): 5
Toxicity testing - towards harmonisation	5(3): 5
USA - call for proposals for alternatives research	7(4): 12
USA - funding for alternatives	7(4): 12
Venepuncture	3(4): 3
WARDS offering \$10,000 in grants for refinement work	9(1): 12

RESOLUTIONS / POLICIES

AAAS resolution: Use of animals in research, testing and education	3(3): 12
AALAS policy: Humane care and use of laboratory animals	2(3): 12
ACT environment strategy	3(3): 2
AIASST policy on the welfare of farmed and research animals	10(1): 9
American Society of Ichthyologists and Herpetologists: Resolution	5(1): 12
Animal testing for extraneous pathogens in vaccines	8(2): 11
Animal welfare societies' policies: AAHR and ANZFAS	3(2): 8
BA declaration: Animals in medical research	3(4): 12
Biotechnology primer. Center for Animals and Public Policy, Tufts University	4(2): 12
Bovine spongiform encephalopathy - summary of Australia's revised quarantine policy	8(2): 6
Coalition's experimental animals policy	1(2): 9
CSIRO Policy on the Care and Use of Animals	7(2): 10
Declaration: Animal protection and violence	3(4): 5
Declaration: Deans of the Associated Medical Schools of New York State	3(1): 12
MAF Policy Paper 102, Review of the Animals Protection Act	4(3): 12
RSPCA (Australia) and animal experimentation	8(1): 10
RSPCA Australia Inc and RNZSPCA	3(1): 5
UK - Animals (Scientific Procedures) Act under review	9(4): 12
US Association for Research in Vision and Ophthalmology (ARVO) policy	4(3): 12
US Public Health Service	7(3): 12
What the animal welfare movement expects of the veterinarian. Br. Vet. Assoc. 1987	2(1): 11
WMA declaration: Animals in medical research	3(4): 12

RODENTS

Analgesia in rabbits and rodents	5(2): 8
Companion Guide to Infectious Diseases of Mice	

and Rats. National Academy Press	5(3): 10
Course of study: Rodent tumours	3(2): 5
Disturbance Index: Assessing Severity of Procedures on Rodents. UFAW. 1988	2(1): 9
Elimination of pathogens from mice	2(1): 4
Genetic Monitoring of Inbred Strains of Rats: A Manual on Colony Management, Basic Monitoring Techniques and Genetic Variants of the Laboratory Rat	5(1): 9
Genetic Variants and Strains of the Laboratory Mouse. 2nd ed. Oxford Uni. Press. 1989	3(3): 8
Guidelines for the Well-being of Rodents in Research. SCAW. 1989	3(1): 10
Guidelines for the Well-being of Rodents in Research. SCAW. 1990	4(3): 9
Hantaan virus in rodent colonies	2(2): 7
Hantaan virus in rodent colonies	3(3): 5
Immunodeficient rodents	3(2): 5
Infectious Diseases of Mice and Rats. National Academy Press.	5(3): 10
Mouse Management. Univ. Melbourne. 1991.	5(1): 9
Postmortem Change in the Rat: A Histologic Characterization. Iowa State Uni. Press. 1987	3(1): 9
Rabbits and the environment	4(3): 4
Rat caging	1(2): 11
Rat communication	4(3): 4
Rat models	4(2): 3
Refinement and Rodents: A Report Concerning the Well-being of Laboratory Rodents. Tufts School of Veterinary Medicine. 1991	5(3): 11
Rodent euthanasia	4(2): 3
Rodent well-being: 1989 meeting	2(4): 12
SPF Unit, Universities of NSW and Sydney	4(1): 10
Study sets of rodent tumours	4(4): 3
The moral status of mice	2(2): 6
The rat as an experimental animal	2(3): 5
Transgenic mice: Probes into complex systems	2(4): 7

SENATE SELECT COMMITTEE ON ANIMAL WELFARE

Government's Response to Senate Select Committee on Animal Welfare (SSCAW) Report on Kangaroos	6(2): 9
Government's response to SSCAW animal experimentation report	3(4): 1
Government's response to SSCAW report on culling large feral animals in the Northern Territory	5(2): 10
Government's response to SSCAW report on intensive housing of livestock	4(3): 6
Government's response to SSCAW sheep husbandry report	3(3): 2
Senate Select Committee on Animal Welfare (SSCAW): membership/terms of reference	1(1): 2
SSCAW animal experimentation report	2(2): 1
SSCAW disbanded	4(4): 2
SSCAW intensive housing of livestock report	3(3): 6
SSCAW report on culling of large feral animals in the Northern Territory	4(3): 7
SSCAW sheep husbandry report	2(3): 6
SSCAW: ACCART submission	1(2): 1

SURGERY

Basic Microsurgical Techniques: A Laboratory Manual. Green and Simpkin. 1988	1(2): 8
Essentials of Experimental Surgery. Butterworths. 1990	5(2): 6
Guidelines for Surgery	7(1): 10
Guidelines on the Care of Laboratory Animals and their Use for Scientific Purposes. Part III. Surgical Procedures. UFAW, 1989	3(2): 9
Orbital puncture	7(1): 5

TOXICOLOGY

Alternative Methods in Toxicology. Vol. 8. Mary Ann Liebert Inc.	5(1): 8
Alternatives to animal experiments in risk assessment. Berlin Soc. Opponents Anim. Expts. and Schering, A.G. 1988	1(2): 11
An ethologist's approach to behavioral toxicology. Neurotoxicol. Teratol. 1988.	2(4): 10
Animal Experimentation: The Consensus Changes. Macmillan	4(1): 9
Animal use in ecotoxicology	9(4): 9
Animals and Alternatives in Toxicology: Present Status and Future Prospects. Macmillan. 1991	5(1): 8
Animals and alternatives in toxicology	4(3): 8
ASCEP 1989 workshop: Alternatives to in vivo toxicology testing - Report	2(2): 8
ATLA alternatives bibliographies	1(2): 8
Benchmarks: Alternative Methods in Toxicology. Princeton Scientific Publishing. 1989	2(1): 9
CAAT in vitro toxicology symposium, 1990	3(3): 4
CAAT in vitro toxicology symposium, 1992	4(4): 12
CAAT/ERGATT validation of toxicity test procedures workshop. 1990	4(1): 6
Carcinogenesis research	2(1): 7
CEC/FAME validated non-animal toxicity test procedures workshop. 1990	4(1): 7
Center for Alternatives to Animal Testing (CAAT)	1(2): 8
Changes to EC/US toxicology regulations	2(4): 4
Chemical data base development	4(1): 6
Consumer product tests	3(4): 5
Cosmetic labelling	4(4): 7
Draize eye test review	1(2): 8
EEC toxicity test methods	4(2): 8
Finland - International Union of Toxicology (IUTOX)	7(4): 12
FRAME 1990 toxicology conference	3(2): 12
In vitro models	6(1): 5
In vitro test validation	4(3): 8
In vitro toxicology data bank (INVITTOX)	2(2): 11
International focus on alternatives	3(3): 4
Laboratory Animal Handbook 11: Technical Procedures in Reproduction Toxicology. Royal Society of Medicine Services Ltd. for Laboratory Animals Ltd. 1990	4(1): 10
LAL test for pyrogens	1(2): 8
LD50 test	2(1): 6
LD50 test	4(3): 8
Multicentre evaluation of in vitro cytotoxicity	3(2): 6
Ocular irritation evaluation	2(1): 6
Proceedings of the second CTFA ocular safety testing workshop: Evaluation of in vitro alternatives. CTFA	5(1): 8
Replacing animal toxicity tests: the challenge of the 1990s	4(1): 6
Review of interspecies risk comparisons. Regul. Toxicol. Pharmacol. 1988	2(4): 10
Symposium - In vitro skin toxicology and eye irritancy testing	5(4): 5
Toxic blue-green algae	7(3): 5
Toxic Substances Bulletin	4(2): 12
Toxicity testing - towards harmonisation	5(3): 5
Zbinden, Professor Gerhard	1(2): 8

TRANSPORT

Animal welfare legislation and transport of animals in Australia - how effective is it?	7(3): 1
Livestock handling and transport	7(3): 2
Transport of farm and laboratory animals	1(2): 5
Transportation/acclimatisation of laboratory animals	2(2): 10
UK - Live animal export	8(2): 12

WILDLIFE

CRC for Biological Control of Vertebrate Populations	5(1): 5
Deer research	5(1): 10
Emu research at University of Queensland	5(4): 10
Equine research	4(3): 5
Ferrets as laboratory animals	5(1): 8
Fertility control of feral equids	5(1): 5
Mammals from Pouches and Eggs: Genetics, Breeding and Evolution of Marsupials and Monotremes. CSIRO Australia, 1990	3(4): 10
Management of feral cats	3(4): 4
Nature Conservation: Cost Effective Biological Surveys and Data Analysis. CSIRO. 1991	4(2): 10
Ostrich farming	4(3): 1
Research and Australian zoos	5(3): 1
Role for Fertility Control in Wildlife Management? AGPS. 1990	4(1): 4
Zoos	1(2): 9

ZOOS

Australian and New Zealand Zoos - captive breeding, husbandry and species management	9(1): 2
Research and Australian zoos	5(3): 1
The Australasian Species Management Program	7(1): 1
Zoos	1(2): 9

Professor David Morton visits Australia

Well over 100 people attended a seminar on the recognition and relief of pain in experimental animals in the Florey Lecture Theatre at the University of Adelaide on the afternoon of 15 September. The speaker, Professor David Morton, holds the Chair of Biomedical Science and Ethics in the Medical School, University of Birmingham, UK. The seminar was sponsored jointly by the University of Adelaide Faculty of Science and ANZCCART.

A veterinarian, Professor Morton's postgraduate career has been in reproductive physiology, and more recently, in the field of alleviation of pain and suffering in experimental animals.

Professor Morton began his seminar by emphasising the importance of scientists' and laboratory technicians' understanding of the normal behaviour of the species of animals under their care. This includes their requirements for space and for movement. He gave as an example the typical wire-floored rabbit cage, whose width is shorter than a rabbit's length and whose height does not allow a rabbit to stand upright.

Floor housing for a species such as this is far better. Similarly, behavioural requirements of rodents (which are largely nocturnal in habit) should be recognised by provision of covered areas into which they can retreat during the day.

Professor Morton referred to the importance of scientists' understanding the



From left: Dr Robert Baker, Executive Officer of ANZCCART, Professor David Morton and the Acting Dean of Science, University of Adelaide, Professor Caroline McMillen

principles of Replacement, Reduction and Refinement – the three Rs. He particularly stressed the need to refine experimental procedures, to minimise the pain and suffering imposed on animals and to alleviate its effects by the use of analgesics.

He believed refinement, while difficult to implement, is perhaps the most important of these principles, which are now included in the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes and hence in Australian State and Territory legislation.

He went on to discuss how to recognise a normal from an abnormal animal. This is not always easy, particularly in those species which conceal signs of pain or ill-health. Experimental animals should be regularly monitored and their state of well-being assessed.

This can be done by means of a "score-sheet", kept by the animal technician, which

records the animals' responses to a set of criteria of well-being. This provides a quantitative means of monitoring an animal's physical well-being and is in use in some laboratory animal houses.

The seminar, chaired by the Acting Dean of Science, Professor Caroline McMillen, generated interesting discussion and was followed by drinks and savouries, which provided an opportunity for those present to meet Professor Morton.

The audience was drawn from the three Adelaide Universities, as well as from the IMVS, PI(SA), the Royal Adelaide Hospital and the Flinders Medical Centre. Many were members of animal ethics committees. It also included veterinary practitioners and a number of honours and postgraduate students.

Robert Baker
Executive Officer, ANZCCART

Professor Morton gave similar addresses at the University of Melbourne and at ANZCCART's Conference in Auckland the following week. He also spoke at the ANZSLAS Conference in Brisbane to complete a very busy two weeks in Australia and New Zealand.

Note: See Professor Morton's letter on page 8 of this issue on intraperitoneal injection of sodium pentobarbitone.

Letters

Intraperitoneal injection of sodium pentobarbitone as a method of euthanasia for rodents

Intraperitoneal (i/p) injection of sodium pentobarbitone (often triple strength @ 200mg/ml) is a common method of killing small mammals and is recommended by many existing guidelines (Home Office, 1990; Anon, 1993; Olfert *et al.*, 1993; Reilly 1993; Close *et al.*, 1996/7). Only one (Close, *loc cit*), mentions irritation to the peritoneum caused by the high alkalinity of the solution as an adverse effect. Wadham (1997) observed that animals killed by this method showed redness at the injection site as well as a writhing behaviour (contraction of the abdomen and extension of the hind legs backwards). He suggested that animals were experiencing pain following injection as writhing is indicative of abdominal pain in mice and relievable with known analgesics. Consequently, a study was undertaken to discover the length of time that animals may experience pain by observing the time taken for redness to develop and the time to loss of pedal reflex.

Fifteen female outbred Hooded Lister rats weighing between 174 g and 194 g were used. In Group one a control animal was killed by concussion followed by cervical dislocation; five animals were given an i/p injection of triple strength sodium pentobarbitone at a dose rate of 667mg/kg and killed by concussion followed by cervical dislocation at half, one, two, four and eight minutes. The peritoneal cavity was opened and photographs taken of the

abdominal contents - from the photographs three independent observers ranked blindly the appearance of the intestines for redness. In Group two, each of nine animals was given a similar dose, but were placed in a European Type III cage and videoed to record their behaviour. After losing their righting reflex, the time to loss of pedal reflex was recorded.

In Group one, the observers all ranked the control animal as having the least red intestines, but apart from that there was no correlation between redness and time between injection and death. Maximum vasodilation may, therefore, have occurred within 30 seconds. In Group two, writhing was observed on average 11 seconds after injection, and the average time to loss of pedal reflex was 175 seconds.

The first sign of pain is writhing, which occurred 11 seconds after injection and we interpret this behaviour as a response to pain resulting from the alkalinity of sodium pentobarbitone solution (found on measurement of five batches to be an average pH of 12.55 +/-0.19). There is also circumstantial evidence for pain as vasodilation of the blood vessels is one sign of the inflammatory response (the others being heat, swelling and pain) and this occurs within 30 seconds. It can be argued that animals continue to feel pain until they lose their pedal reflex at about 175 seconds, as loss of the pedal reflex is frequently used as an indicator of adequate anaesthetic depth for surgical procedures. So animals killed in this way may be in pain for 164 seconds which is clearly a matter of concern.

Intraperitoneal injection

of sodium pentobarbitone, therefore, may not be a humane method of euthanasia and we recommend that it be replaced with a less irritant chemical. One possible refinement may be to add a fast acting local anaesthetic to the sodium pentobarbitone solution to anaesthetise the visceral nociceptors before the irritant effects of sodium pentobarbitone are felt.

Acknowledgements

The work was supported by grants from the British Veterinary Association; Animal Welfare Foundation and the Pfizer/LASA Animal Welfare Research Award Fund.

JJB Wadham, P Townsend and DB Morton
Centre for Biomedical Ethics
The Medical School
University of Birmingham, UK

References

- Anon. (1993). Report of the AVMA panel on euthanasia. *Journal of the American Veterinary Medical Association*. 202: 230-249.
- Close, B.S., Banister, K., Baumans, V., *et al.*, (1996; 1997). Recommendations for euthanasia of experimental animals. *Laboratory Animals*. 30: 293-316 and *Laboratory Animals*. 31: 1-32.
- Home Office. (1990). *Guidance on the operation of the Animals (Scientific Procedures) Act 1986*. HMSO, London, UK.
- Olfert, E.D., Cross, B.M. and McWilliam, A.A. 1993. *Guide to the care and use of experimental animals*. Volume 1. 2nd edition. Canadian Council on Animal Care. Bradda Printing Services, Ontario, Canada.
- Reilly, J.S. (1993). *Euthanasia of animals used in scientific purposes*. ANZCCART, Adelaide.
- Wadham, J.J.B. (1997). *Recognition and reduction of adverse effects in research on rodents*. PhD thesis, Faculty of Medicine and Dentistry, University of Birmingham, UK.

Modular bioreactors

Recent changes to the use of ascitic fluid for monoclonal antibody production have led to the introduction of modular bioreactors as *in vitro* alternatives.

These systems have in common 10-40 ml production compartments which are separated from the excess nutrient medium by a low molecular weight cutoff microporous membrane. Nutrients and waste products flow across the membrane, while cells and antibody remain trapped in the production compartment. High cell densities can be achieved by the silicone membrane/tubing which improves gas exchange.

Cells in a 10-35ml volume are inoculated into the production module. After a short lag period, cells and antibody can be harvested on a regular basis during the culture period, which can last from a few days to several months. Small samples can be easily taken to monitor cell viability and antibody production. The cells can be adapted to serum-free medium which will facilitate downstream purification if this is required.

The central monoclonal laboratory at the Walter and Eliza Hall Institute has used two of these systems.

One system uses hollow fibre technology, where cells previously adapted to serum-free medium are inoculated into the extracellular space of a hollow fibre cartridge. After the short lag period, cells were usually harvested every 48 hours and medium is changed daily. Cell harvests took about 30 minutes to perform. As the cartridges for this system are relatively expensive, long-term culture

(longer than 30 days) is required to obtain antibody yields to make it cost effective. It requires reasonable cell culture expertise to set up and operate. We have had several good antibody yields (100mg-300mg in 30 days) from this system.

The other system uses fast agitation of the modular bioreactor on a dedicated roller apparatus. Cells are inoculated into the 40ml production compartment which clips onto a reusable nutrient (500ml) compartment. This system is easy to set up and operate and when medium containing serum is used, antifoam needs to be added to the nutrient compartment to prevent foaming due to the fast agitation. This system can also produce good yields of antibody, but at present we are having problems with some cell lines not adapting to the fast agitation which is required.

We hope to overcome current technical difficulties and improve antibody yields in these systems after a workshop in March, which will be conducted by Dr Howard Petrie from the Memorial Sloan Kettering Cancer Institute in New York. Dr Petrie has evaluated several of the bioreactor systems and successfully uses the two systems discussed above.

Wendy Carter
Walter and Eliza Hall Institute
of Medical Research
Melbourne

Editor's Note: For more about *in vitro* production of monoclonal antibodies, see the article by Dr Petrie in the June 1997 issue of ANZCCART News (10(2): 6)

New Board structure now in place

A Special General Meeting of Council in Melbourne on 13 November accepted a series of five recommendations from the Board for its restructuring and for the operation of Board Committees. The recommendations were:

- In order to improve the efficiency and effectiveness of ANZCCART's operations, the structure of the Board is to be changed from the present 10 members to representatives of the five major sponsors (and of other major sponsors who may join in the future). The Chairman will be from among these and the position will rotate between the members. Professor Michael Rickard from CSIRO will be Chairman for the first year.
- That the existing Council remain unchanged, with the addition of an animal welfare member and an independent lay person.
- That the Board has responsibility for deciding the tasks, programs and activities of ANZCCART and works closely with the Executive Officer, who will be responsible to the Chairman for their implementation.
- That the Board may appoint working parties as required, each of which will be chaired by the Executive Officer, who will be responsible for coordinating their activities.

- That the new Board may coopt other persons to it, if required.

The new Board took effect from the conclusion of the meeting and comprises;

Professor Michael Rickard
(CSIRO), Chairman

Professor Roger Holmes
(AV-CC)

Professor Caroline McMillen
(ARC)

Professor David Mellor
(Royal Society of New Zealand)

Dr Michael Calford
(NHMRC).

At the conclusion of the meeting, the Chairman, Dr Elizabeth Close, and the Animal Welfare member on the Board, Mr John Strachan, retired. The two members of the Board elected by the General Members, Professor Eugenie Lumbers (CABSAE) and Dr Susan Maastricht (ANZSLAS) retired from the Board, but remain members of Council.

Professor Max Charlesworth, the Lay Member on the Board, resigned recently due to ill-health.

The Board's thanks are extended to all of the above for their contribution to ANZCCART.

The next ANZCCART conference

There will not be a conference held in Australia or New Zealand in 1998. The next conference in Australia is to be in May, 1999, with the theme likely to be *The Use of Animals in Wildlife Research*. No date or venue have been set. ANZCCART is also likely to hold a conference in New Zealand in September, 1999.

Survey of New Zealand Animal Ethics Committees

The New Zealand Animals Protection (Codes of Ethical Conduct) Regulations 1987 require that those proposing to manipulate animals for scientific or teaching purposes have a code of ethical conduct (which must be approved by the Minister of Agriculture). Codes must make reference to the measures to be taken by the organisation to ensure compliance with the code. Codes must be scrutinised by the National Animal Ethics Advisory Committee (NAEAC), which must make a recommendation whether or not the Minister should approve the code. In practice, NAEAC has not recommended that the Minister approve any code which did not contain a provision to establish and maintain an animal ethics committee (AEC) as a means of ensuring compliance with the code.

In this environment, knowledge of how and how well AECs operate has been largely anecdotal, although the New Zealand Veterinary Association has carried out a survey of its nominees on AECs. In an attempt to gain a more complete picture of the operation of New Zealand AECs, NAEAC conducted a survey of all AECs earlier this year. The survey marked the 10th anniversary of the enforcement of the regulations.

The questionnaire was adapted from one used by Pennsylvania State University in 1995 entitled *IACUCs: Celebrating 10 Years of Experience*. The questionnaire was posted to all 48 AECs at the time, under cover of a letter from NAEAC's chairman. A reminder to return completed questionnaires was published

in *NAEAC News* a month later and a further copy of the questionnaire was later posted to non-respondents. The final response rate was 85%.

Findings

AEC Operations

AECs range in size from four to 14 members - the average size being six and the most common size being five members. The composition of AECs required by NAEAC is one or more staff members plus at least three external members - a veterinarian, an animal welfare group nominee and a lay person.

ber of meetings held is, by and large, a reflection of the amount of business.

When asked how many applications were received by AECs in 1996, responses ranged from 0 to 250; average 28. The vast majority of AECs receive protocols which are written in plain English (e.g., AECs dealing with applications from school students) or which contain a plain English summary.

It should be noted that some of the AECs surveyed were newly established and others were set up to deal with occasional rather than regular use of live animals

tions of animal housing were carried out (by one or more AEC members, not necessarily the whole committee) with a frequency ranging from monthly to annually to as required. It is worth noting that some organisations which use animals do not house them - animals may be brought in for, say, a teaching exercise and be returned home that evening.

Two-thirds of AECs report occasional to monthly inspections of the facilities used to perform animal manipulations and 63 percent inspect some actual manipulations in progress from time to time.



The members of NAEAC

Meeting frequency varies considerably. In 1996 the number of meetings held ranged from 0 to 12. The average number of meetings per year is three. In addition, most committees have a procedure for approving protocols between meetings. NAEAC recommends that AECs meet at least four times each year unless there is no business to discuss. However, the number of protocols considered by institutions which did not meet at least four times last year was considerably lower than the number of protocols considered by institutions which met four or more times. Thus, it appears that the num-

(e.g., committees set up to serve secondary schools or science fair projects involving live animals).

Monitoring

NAEAC regards monitoring as a vital function of AECs. Guidelines for AECs published in 1988 stated that one of the functions of an AEC was to ensure that approved procedures were being followed. These guidelines also stated that it is very important that the entire committee makes site visits to the animal facilities and to all laboratories where animals are used.

Sixty-three percent of AECs reported that inspec-

It is interesting to note that while there was a low non-response rate to questions on whether monitoring / inspections were undertaken, the non-response rate to the questions on how often such inspections were performed was comparatively high - 38 percent. This suggests a less than frequent/regular pattern of inspections.

Nevertheless, 80.5% of organisations stated that they were satisfied that the activities they approved were monitored adequately. Various AECs pointed to financial constraints, members' lack of time and the difficulties of monitoring field work.

Oversight of Other Organisations

Some organisations which manipulate animals infrequently or on a small scale may not want to develop their own code of ethical conduct and establish an AEC. Such organisations have been permitted to adopt the approved code of ethical conduct of another organisation and use their AEC. This procedure is, of course, subject to the agreement of the organisation concerned and the Minister's consent. Such arrangements may be of additional benefit to the smaller organisation, inasmuch as the supervising organisation (often a university or major crown research institute) will provide a wider range of expertise and advice than would otherwise be available.

In the questionnaire, organisations were asked about any oversight of other institutions. This brought to light a few informal arrangements between AECs and other organisations, so the opportunity has been taken to remind all AECs of the correct procedures and the need for the Minister to approve any arrangements to supervise others. Organisations also reported using a variety of methods for ensuring that a remote organisation complied with the code including visits, reports, personal communications, veterinary supervision or the remote organisation using the host's facilities.

Conclusion

The survey showed a high degree of willingness to co-operate with NAEAC on the part of AECs.

The survey also provided NAEAC with a great deal of information about how New Zealand AECs operate. As far

as can be ascertained, the survey provided confirmation that most AECs appear to be doing their job adequately.

For reasons of both animal welfare and public credibility with a largely self-regulatory system, NAEAC would like to see AECs performing their functions in an optimal fashion. Our results highlighted areas where NAEAC could provide further guidance to AECs and areas where expectations of AECs could be made plainer.

NAEAC will continue to liaise with ANZCCART New Zealand regarding the proposal to establish a system for independent AEC review and has recommended that such a review become a legislative requirement.

Linda A Carsons
MAF Regulatory Authority
Wellington, New Zealand

References

- Carsons, L.A. (1997). Survey of Animal Ethics Committees, unpublished.
- National Animal Ethics Advisory Committee. (1988). *Guidelines for Institutional Animal Ethics Committees*.
- Smith, C. (1997). Animal Welfare / Ethics Update, *VetScript*, X(3)

ANZCCART's Auckland Conference

The Board of ANZCCART New Zealand planned and hosted what was probably ANZCCART's best conference to date, at the University of Auckland on 19 and 20 September, on the theme, 'Ethical Approaches to Animal-based Science'.

Professor Sir Colin Spedding, Chairman of the

UK Farm Animal Welfare Council and Professor David Morton, from the University of Birmingham, contributed greatly and gave an international perspective to the Conference. There were five sessions over the two days, with the opening session focussing on value systems and animal-based science. This included papers on the environment and animal welfare; on ethical issues and animal use in science; on the need for animal-based scientists to understand and express ethical integrity and on the intersection between science and ethics in the promotion of animal welfare. This session generated much discussion and gave the conference an exciting and stimulating opening.

The second session covered societal consensus, public policy and animal welfare awareness and the third addressed the controversial topic of humane end points. Speakers in the third session included Professor Morton and Associate Professor Rosemarie Einstein.

On the second day, sessions covered two distinct subjects; the effective operation of animal ethics committees and methods of research in vertebrate pest control.

The final session, Point and Counterpoint, allowed speakers from a number of different organisations to present their views on prioritising animal, human, scientific and environmental issues.

There were nearly 200 registrants and feedback since the Conference has been very positive. The Proceedings should be published in March, 1998.

Coming up

IAT / LASA / BLAVA Congress '98

1 - 3 April, 1998

Swansea, UK

Contact: Alan Graham,
Dept of Physiology,
Cambridge University,
Cambridge UK CB2 3EG

14th Australasian Biotechnology Conference

"Food and Health for the
21st Century"

19 - 23 April, 1998,

Adelaide

Contact: PO Box 153
Nairne SA 5252

Tel / Fax: 08 8388 6164

Email: Biotech.Conf
@flinders.edu.au

Australian Veterinary Association Annual Conference

18 - 22 May, 1988, Sydney

Contact: Mrs Doreen
Culliver, AVACOS, 7

Phipps Place, Deakin ACT
2600

Tel: 02 6285 3600

Fax: 02 6285 3913

AATA / NZASTA Conference

8 - 10 July, 1998

Brisbane

Contact: Mrs S Kempster,
OTS / BBS, Science 2
Building, Griffith University,
Qld 4111

Fax: 07 3875 7791

Email:

M.Bathurst@sct.gu.edu.au

INVITOX 98

10th International Workshop in Vitro Toxicology

14 - 18 September, 1998

Winchester, UK

Contact: Dr Diane Benford
School of Biological
Sciences, University of
Surrey, Guildford, Surrey
GU2 5XH, UK

Fax: 44 1 483 300 374

Email:

d.benford@surrey.ac.uk

News

Information Package for Animal Ethics Committees

ANZCCART is pleased to announce that its Information Package for AEC Members will be available in February.

The package comprises 25 pages of information on AECs and how they function, with specific reference to the roles of the various members. A number of references are included, together with a list of references for further reading.

The package will include the 1997 edition of the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*, as well as the relevant State or Territory legislation and a copy of the 1996 ANZCCART monograph, *Animal Experimentation: A Student Guide to Balancing the Issues*, by Vaughan Monamy.

It is provided in a folder and will be a valuable asset to members of AECs, as well as to scientists, government and animal welfare organisations. The approximate cost for the package will be \$40, but will vary slightly between States, depending on the price of the relevant legislation. Details can be obtained from ANZCCART's Adelaide office.

New database for scientific conferences in Australia

The Australian Academy of Science has set up a database for conference listings on its website: <http://www.science.org.au>. Conference convenors can register their conference free of charge.

New edition of the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes

The new edition was sent to the printer just before Christmas and should be available early in the New Year.

Associate Professor Michael Perry, who chaired the working party which revised the Code, has given a number of addresses on the new edition.

Videotape copies of his seminar at Monash University, Melbourne on 15 September, 1997 are available for \$15.00 (including postage) from Ms Angela Penney, Animal Ethics Officer, Monash University, Clayton Vic 3168. Tel: 03 9905 3866; fax: 03 9905 5121; email Angela.Penney@adm.monash.edu.au.

More about adjuvants and alternatives

Information Resources for Adjuvants and Antibody Production: Comparisons and Alternative Technologies

USDA, AWIC Resource Series Number 3 1990 - 1997.
ISBN 0 900767 91x

The US Department of Agriculture's National Agricultural Library published this 180 page monograph in August, 1997 as the third in its AWIC Resource Series. Edited by Cynthia Smith and others, it comprises two key articles, together with bibliographies, guidelines, policies and lists of resources, including companies and websites.

The first paper is an Overview of Adjuvants, by W. Hanley *et al.*, which explains the function of adjuvants, guidelines for the use of adjuvants, particularly Freund's adjuvants and introduces alternative adjuvants.

The second paper by U. Marx *et al.*, is a reprint of the Report and Recommendations of the ECVAM Workshop 23, on Monoclonal Antibody Production, published in the journal *ATLA*, April 1997 (25, 411 - 422). This was discussed briefly in the June, 1997 issue of *ANZCCART News* (10(2): 6) and copies are available from ANZCCART's Adelaide office. The Workshop evaluated the *in vitro* methods for monoclonal antibody production and compared the advantages and disadvantages of these with the *in vivo* method using ascites in the mouse.

The monograph is available from the USDA Animal Welfare Information Center, National Agricultural Library, 10301 Baltimore Ave, Beltsville, MD 20705-2351, USA. Fax: 1 301 504 7125; email: awic@nal.usda.gov.

Databases on alternative methods

There is currently a lot of interest within Australia and New Zealand about alternatives to animal use in research, teaching and testing.

The journal *ATLA* (Alternatives to Laboratory Animals) this year published (25, 411 - 422) a report of the ECVAM Workshop number 25 and its recommendations about the Current Status and Future Developments of Databases on Alternative Methods.

This short paper is available free of charge from ECVAM as a offprint (JRC Environment Institute, 21020 Ispra (Va) Italy), or copies can be obtained from ANZCCART's Adelaide office.

ANZCCART News is published quarterly by the Australian and New Zealand Council for the Care of Animals in Research and Teaching Limited.

It is a publication for researchers and teachers; members of animal ethics committees; staff of organisations concerned with research, teaching and funding; and parliamentarians and members of the public with interests in the conduct of animal-based research and teaching and the welfare of animals so used.

Contributions to ANZCCART News are welcomed and should be sent to:

Dr R.M. Baker, Executive Officer, ANZCCART,
PO Box 19, Glen Osmond, SA, 5064.

Tel. 61-8- 8303 7393: Fax. 61-8- 8303 7113
E-mail address: anzccart@waite.adelaide.edu.au

<http://www.adelaide.edu.au/ANZCCART/>

or

Mrs G. Sutherland, ANZCCART New Zealand
PO Box 598, Wellington, New Zealand

Tel. 64-4-472 7421: Fax. 64-4-473 1841
E-mail address: anzccart@rsnz.govt.nz

<http://www3.rsnz.govt.nz/ctees/anzccart/>

ISSN 1039-9089