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The New Code Has a New Name

Geoff Dandie, CEO, ANZCCART

The long awaited revision of *the Australian Code of Practice for the Care and Use of Animals Used for Scientific Purposes (7th Edition)* was finally released on 25 July and so the process of implementation begins.

While the 8th Edition has been published under a slightly different name "*The Australian Code for the Care and Use of Animals Used for Scientific Purposes*", the scope of the Code and its strong reliance on the essential principles of the 3Rs have been maintained as have many other important aspects of the Code. There have, however, been a number of changes and among the most important are much clearer definitions of a number of parameters, much clearer guidance when it comes to the area of responsibilities and perhaps most important of all, very careful use of and much clearer distinctions between two of the most important words that direct the interpretation of the Code: 'should' and 'must'. The simple fact that 'must' is clearly defined as obligatory and 'should' as strongly recommended, often linked to how

obligatory ('must') requirements can be met, means that much of the confusion that has been associated with the interpretation of such terms will be a thing of the past. This will inevitably make life a lot easier for those who need to interpret and apply the principle within the Code so that they can ensure their AEC, researchers, teachers, animal care staff and administrative staff are all working in a way that will be fully compliant with the principles and expectations of the Code.

What has changed?

As indicated above, the most immediately noticeable change is to the title, which has been amended to reflect the principles-based nature of the document. Possibly one of the more important changes in the Code is the philosophical change from a general policy of "doing no harm" to one that is actively promoting the wellbeing of animals used for scientific purposes. While this change may be rather subtle at first glance, the increasing importance on the wellbeing of animals is emphasized by the structural changes that include an entire section (Section 3) devoted to this ideal.

Another key change is that the Code is only being published electronically and not in hard copy. While this is a change that will be mourned by many, it is a reflection on both the electronic age in which we live and the costs associated with printing and distribution of booklets of this kind. As ANZCCART was also forced to make the same decision over a decade ago because of the increasing costs associated with publishing in hard copy, we are well-placed to understand that this must have been a difficult and potentially unpopular decision to make, but one to which people will (hopefully) adapt fairly quickly. It is possibly worth noting here that the 7th Edition of the Code has been officially listed as 'out of print' and only available in electronic form for around three years now.

The Code has been restructured in a way that will help to reflect and emphasize the governing principles that determine how animals may be used for scientific purposes. Part of this has been the restructuring of the various chapters within the Code, but also the clearer definition of key terms and phrases; greater clarity relating to the use of terms such as "must" and "should" are all central to this restructure.

The six major sections of the new Code are:

1. Governing principles
2. Responsibilities
3. Animal Well-being
4. The care and use of animals for the achievement of educational outcomes in science
5. Complaints and non-compliance
6. Independent external review of the operation of institutions

The fact that there is a much greater emphasis on defining the responsibilities taken on by all involved with the scientific use of animals and on maintaining the health and welfare of animals is very clear from these section headings.

Having a new section included - *Section 3: Animal Well-being* is a very positive step as well. Even though this section largely contains information from previous iterations of the Code, the fact that the relevant parts of the old Code have been carefully collated and presented as a Chapter in its own right illustrates how important the well-being of animals is within this version.

One of the biggest changes in this version of the Code really represents a very minor change in reality. In the 7th Edition of the Code, Appendix 1 outlined a process for regular external review of the operation of an AEC as a recommendation. The fact that this

recommendation was almost universally adopted and strongly supported by institutions across the country helped to ensure the evolution of these reviews. The concept of regular Independent External Reviews has now been incorporated into the body of the Code (Section 6) with the requirement now clearly stated that institutions must ensure that an independent external review be conducted at least every four years, to ensure the institution's compliance with the Code, and to ensure the continued suitability, adequacy and effectiveness of its procedures to meet its responsibilities under the Code.

What has not changed?

Perhaps the quickest and simplest answer to this question is "pretty much all of it". Yes the Code has been restructured and sections regrouped and rearranged so they make more sense, but essentially very little has actually changed. The Code itself still holds the principles of the 3Rs at its core and even though it has been rephrased slightly, it still has the absolute requirement for any use of animals to be fully justified before it can be approved by an AEC.

Use animals only when justified

1.5 Evidence to support a case to use animals must demonstrate that:

- (i) *the project has scientific or educational merit, and has potential benefit for humans, animals or the environment*
- (ii) *the use of animals is essential to achieve the stated aims, and suitable alternatives to replace the use of animals to achieve the stated aims are not available*
- (iii) *the project involves the minimum number of animals required to obtain valid data*
- (iv) *the project involves the minimum adverse impact on the wellbeing of the animals involved.*

1.6 Projects must only be undertaken:

- (i) *to obtain and establish significant information relevant to the understanding of humans and/or animals, or*
- (ii) *to maintain and improve human and/or animal health and welfare, or*
- (iii) *to improve animal management or production, or*
- (iv) *to obtain and establish significant information relevant to the understanding, maintenance or improvement of the natural environment, or*
- (v) *to achieve educational outcomes in science, as specified in the relevant curriculum or competency requirements.*

1.7 An animal ethics committee (AEC) must be

satisfied that there is sufficient evidence to support a case that the proposed use of animals is justified.

Feedback to date

So far, most of the feedback about the revised Code itself has been very positive. People seem to really like the new layout of the Code and I have heard a number of very positive comments about it being much clearer than before. There also seems to be a genuine appreciation for both the clear definitions and the tightening up of the use of the keywords 'should' and 'must' as their use have long been a source of contention.

The only negative comments I have heard have related to the decision not to print a hard copy version of the Code. Interestingly, these have varied a little in themselves as there have obviously been a number of people who still prefer to work from a printed book, but there have also been groups that have suggested that it would be good to see the Code developed as an App so they can easily access it from their phone or tablet. However, perhaps the most common suggestion has been that the Code should still come with an index. Interestingly, this suggestions has come from people working ebook versions of the Code as often as it seems to have come from those still working with printed versions. So, no matter how infinitely searchable a pdf file may be for individual words or phrases, it would seem that there is nothing more comforting to many than a good old-fashioned index that can be scanned for the right memory trigger.

ANZCCART Conference 2013

Geoff Dandie, CEO, ANZCCART

This year's ANZCCART conference was held in the Sydney beachside suburb of Manly from Tuesday 23 to Thursday 25 July and featured the usual mix of talks and the customary discussion, debate and dissection of ideas that are a part of every ANZCCART conference.

The opening presentation from ANZCCART Honorary Life Member Margaret Rose set the pace for day one by challenging delegates to reset their moral and ethical compasses (or GPS) and potentially focus more on the basic issues of right and wrong during AEC

deliberations at the same time as considering the 3Rs and the classic 'cost versus benefit' analysis that are central to every AEC's process of deliberation. This was the perfect launch pad for the following excellent presentations that explored issues associated with transparency within the AEC system and the collation of national animal use statistics.

Other key presentations during the day considered the welfare advantages of transporting embryos or sperm instead of live laboratory mice and in a similar line, a later presentation discussed the ethical and financial benefits associated with the cryopreservation of mouse lines instead of maintaining a line for subsequent use. During this second session, we also heard about the work of the NSPCA Animal Ethics Unit in South Africa as well as hearing about some of the issues associated with the AEC system from the perspective of a wildlife researcher and the particular issues faced by scientists not involved with laboratory-based biomedical research projects.

The formal presentations for Tuesday wound up with a series of short presentations that covered the formation of a local discussion group for AEC members and Executive Officers and some of the advantages that come from such collaborations. There was also a fascinating presentation on the emotional welfare of a variety of animals, including fish and lizards, which provoked great interest as did the discussion of balancing out the ethical, welfare and commercial requirements associated with contract research projects. Delegates were also treated to a most enlightening and enjoyable presentation on statistics and their role in ethical research. For those of us who never considered statistical analysis to be either interesting or enjoyable (potentially a very significant proportion of the audience), this presentation was a real eye-opener.

The second day started off with a fascinating examination of the effects housing conditions and environmental enrichment can have on brain development in laboratory rodents and how that can also profoundly affect both physiological parameters and the validity of a number of experimental models used in neurobiology and psychiatric research work. So, while animal care facilities are eagerly embracing the virtues of individually ventilated cages and ethics committees are increasingly insisting on appropriate environmental enrichment for animals, we do need to be cognisant of the fact that these changes can have fairly profound effects (both positive and negative) on the validity of studies being undertaken.

This session then expanded into some excellent developments in the area of researcher training and

some of the different modules that are considered to be important as well as some of the possibilities for the effective assessment and recording of researcher competencies in key areas. Some of the proposed topics that make up an effective training curriculum were thought to include the following:

- Introduction to the Code, the AEC system and the use of animals in research;
- Effective monitoring in terms of both pain management and anaesthesia;
- Developing and using monitoring checklists;
- Basic animal care:- handling & monitoring as well as basic research procedures;
- Principles of anaesthesia and analgesia;
- Aseptic surgical techniques.

The final presentation in that session discussed the process and effectiveness of the external triennial reviews that were introduced with the 7th Edition of the Code and how they have been so effective in raising the overall standards of AEC operations, researcher compliance and the welfare of animals since they were implemented a decade ago.

The next session focussed on some of the issues, advantages and improvements in imaging techniques that have been developed recently and the effective ways in which these can be used in both large and small animal models to raise animal welfare standards and improve the quality of a number of research studies, particularly longitudinal studies. These have helped to significantly reduce the number of animals required for many such experiments by allowing simple and effective monitoring of disease processes and development over time rather than having to use hundreds of animals in sequential sampling experiments. This session wound up with a presentation that looked at research integrity and the appropriate actions that should result if researchers deviate from approved protocols.

After lunch, the focus of the next two presenters was assessment and management of pain and balancing the imperative for adequate pain management against the experimental outcomes and progression of disease processes under investigation. We also heard about the need to be able to respond effectively to any unexpected outcomes that might crop up during the course of any project.

We then moved the entire conference from Manly to the Taronga Zoo where we heard three dynamic and inspiring presentations that effectively encompassed all the ideals and objectives of ANZCCART within the microcosm of the zoo and their objectives. Individually, these three speakers focused on the effective and ethical use of animals in education in a way that can even engage students who are generally distant or distracted

in classes, and the difficult ethical decision making processes that are often required when considering the welfare of animals including native animals that have been successfully treated in the Zoo's hospital section. The session concluded with a really challenging and thought-provoking presentation, considered by many to be the talk of the conference. It dissected the range of practical, welfare and ethical issues that must be considered by the Zoo when dealing with the animals in its care. The only problem with this session was that it was so interesting and engaging that we went a few minutes over time and that was enough to turn our planned twilight walk through the Zoo into a rather dark night time walk. We were, however, fortunate enough to be able to stay on and enjoy an excellent dinner at the Zoo itself and enjoy the spectacular views of Sydney, the Bridge and the Opera House across the harbour.

The first session on Thursday morning featured three speakers, the first of whom explained some of the potential problems and advantages of model-based science as well as the importance of considering the type of model system that is being proposed and how it will achieve the stated aims of the work. We then heard two presentations that examined different aspects of training and competency. The first one focussed on not just educating new researchers about their obligations, but actually winning over the hearts and minds of researchers so that they really take all these ideas on board. The important take home message behind this talk was that there will never be someone looking over the shoulder of every researcher every hour of every day (because they do work long and often irregular hours) so there needs to be an atmosphere of trust so we can continue to be confident that no matter whether it is the middle of the day or the middle of the night, the welfare of animals will be looked after appropriately. The final presentation of the session picked up on one of the themes from the talks at the Zoo and some very impressive work done with students in partnership with their teachers, local farmers and their animals that produced some truly outstanding results.

The second session of the day started off with a really informative presentation that considered the use of non-vertebrate species like insects and explained how valuable they can be in many studies. At this point, there were two departures from the published programme. The first was unplanned as one of our speakers was suddenly taken ill and unable to attend the conference. The other had been planned for months, but had to be kept under embargo until after the release of the *Australian Code for the Care and Use of Animals Used for Scientific Purposes (8th Edition 2013)* 24 hours beforehand. This combination of events meant that we were fortunate enough to receive the first public

briefing on the 8th Edition of the Code from the head of the section within the NHMRC that hosted the revision process. The 8th Edition of the Code can be accessed at: www.nhmrc.gov.au/guidelines/publications/ea28.

The final session of the conference started off by revisiting the recent advances made in diagnostic imaging for research and focused on cancer research, in which this technology is particularly relevant. We then ventured into a more philosophical discussion of the really important issues associated with the setting of humane end-points as an integral part of the AEC approval process. The formal programme concluded with a fascinating history of the animal welfare movement and a tribute to one of its founders, Frances Power Cobbe and some of the lessons we can take with us into the future.

ANZCCART AEC Member of the Year Named

The winner of the 2013 ANZCCART AEC Member of the Year award was announced at the Conference dinner in Sydney. Robyn Sullivan from Victoria is this year's recipient and proved to be a very popular selection.

It is clear that Robyn has shown extraordinary dedication and effectiveness in her role as a Category C member on the various AECs on which she has served in Victoria for over 25 years. Robyn is currently a Category C member on four Victorian AECs and continues 16 years' service on an overarching Animal Welfare Committee setting central animal welfare policy for a large University. She also donates her time to helping the Bureau of Animal Welfare train new AEC members. Robyn is a former member of the NHMRC Animal Welfare Committee and the Victorian Minister for Agriculture's Animal Welfare Advisory Committee 3Rs sub-group.

One of the most striking things about Robyn is her professional determination. She takes the principles of the 3Rs very seriously and expects others serving on the AEC and making applications to the AEC to do the same. She dispassionately and logically proposes alternatives and refinements to experimental methods and design based on rigorous literature review. Always working to a high level of professional conduct, she

tirelessly seeks information to support the best possible outcomes for animals.

From all the information included in the nominations, it was very clear that Robyn has set a high standard of performance for AEC members over many years and has never wavered in her dedication to the cause or to her aspiration for continual improvement in both AEC standards and the welfare of animals.



What If Extinction Is Not Forever?

Editorial:

The issue of "bringing back" extinct species by the use of various molecular biological techniques is not a new one, but it is a topic that does come up with increasing frequency as science gets closer to discovering techniques that might possibly work. Of course, there is more than just scientific advancement to be considered here, because there are a number of important ethical issues that must also be considered - preferably before scientific advances force a more urgent or potentially retrospective debate.

In a recent article in the journal *Science* (see recent articles of interest listed in this issue), Jacob Sherkow and Henry Greely cite some work done in Spain that used somatic cell nuclear transfer techniques in an attempt to revive an extinct species, the Pyrenean ibex, using cryopreserved tissue. This work is just one

important example to consider, because after many, many attempts they were able to succeed in getting an embryo to survive to term, even though it did die only minutes after birth due to lung abnormalities. While still ultimately unsuccessful, this is a big step forward in attempts to restore a previously extinct species to life. So even though "molecular cloning technology" of the ilk that brought us movies like *Jurassic Park* might remain the exclusive providence of Hollywood for now, the potential for science to catch up with imagination in this area is very real and cannot be ignored forever. Accordingly, those who have been quite comfortable with the idea that the inevitable ethical debate is "coming, but still a way off"; may soon need to reconsider the timeframe for such discussions, as time may be shorter than many have realised.

The speed with which science can progress after one or two fairly small advances is something that has to be seen to be believed. People involved in the research that led to the development of *In Vitro* Fertilization (IVF) as a method for treating human infertility 30 years ago might be the most qualified to comment here, because it was simply the case that scientific progress was so fast that ethical debate and the reasonable need to set boundaries could not keep up. Society (particularly in countries such as Australia) was very fortunate to have IVF research being driven by some very ethical scientists and clinicians who recognised the potential dangers associated with their explosive rate of progress and actually pushed the ethicists to catch up. However, the fact that this work was being done in human patients rather than extinct animal species might have helped trigger this greater ethical concern and more cautious approach.

This leads to a number of equally important questions that might need to be considered when research aimed at resuscitating extinct species looks like coming to fruition, for example, should there be some universally adopted guidelines for researchers when it comes to questions such as what species should be revived, how they are cared for and the ultimate fate of such animals. For example, we might look at some fairly simple questions such as: is it ok to try to revive species that only died out because humans hunted them to extinction? An affirmative response to this question would mean working to revive the Thylacine (Tasmanian tiger) might be considered acceptable and one could reasonably expect that success in this mission would then be seen as a breakthrough for both science and conservation. However, success would bring other issues into the light, would such success be the end of our ethical responsibility? If we were able to reproduce the Thylacine, how many should be produced? Should they be allowed to breed? How

could we introduce genetic diversity to the species? Who would care for the animals produced and for how long? Could / should they be restored to a stage where they could live in the wild? What potential effects would their release have on their natural environment in the Tasmanian bush? Could the restoration of Tasmanian tigers to their natural habitat be the last nail in the coffin of the Tasmanian devil population that is currently being devastated by infectious facial tumours? Could it assist efforts to restore Tasmania's fox-free status? Depending on how all these questions are addressed, science may end up facing a bigger one: Could working to correct our earlier errors in the conservation of native animal species end up causing greater environmental devastation or would any such effects merely be part of the act of restoration - bringing about what otherwise would have occurred naturally?

Leaving aside the myriad of questions arising out of the simpler ethical issue associated with correcting human error, where might we need to consider setting boundaries for the revival of extinct species more broadly, or should there be any boundaries at all?

Would it be responsible to strive to reintroduce species to the wild that have previously become extinct through natural processes of predation, climate change, loss of food types, loss of habitat, or other changes to their normal / past environment? One might reasonably surmise that the reintroduction of a species to an environment, from which it has already died out, could be fraught with a multitude of ethical issues. While many of these ethical questions will apply equally to current and frequently lauded programmes that breed up endangered animals as insurance populations, or even programmes where species that have died out in the wild are being captive bred and then released back into their "natural environment", they are still important questions. It may also be that these questions are more important in cases where molecular techniques are employed to revive extinct species simply because of the technology involved.

Could there be an argument for the revival of species that were previously wiped out by some cataclysmic event beyond the scope of what could be considered normal evolutionary processes? If so, we might suddenly find ourselves in a situation roughly akin to the fictional realms of *Jurassic Park*. While it is highly unlikely that anyone would ever consider the production of prehistoric dinosaurs for release into the natural environment, the scientific interest and value that might be generated from one or two specimens could be immeasurable. However, would mere scientific curiosity justify the risks, costs or dangers or restoring such species? Could we ethically justify the re-creation of such a species for the purpose of scientific exploitation

and their inevitable destruction? Would we consider the production of sufficient animals to stock large-scale, open plains zoos, or is this starting to sound too much like a movie script? Whatever the scale or outcome proposed for such animals, the ethical issues would be many and varied - presumably to the point where it would be difficult to justify the restoration of such species.

The harsh realities of life may well mean that the ethical concerns associated with the restoration of previously extinct species are so great that there would only be very limited circumstances under which such work might be allowed to proceed, if at all. Equally, it is not out of the question that some at least might see such technology as a global panacea for generations of environmental disasters. Perhaps a more likely outcome would fall between these two extremes, and the prospect of shedding a little light on where along that spectrum of public opinion might fall would be a very worthwhile outcome. Either way, the important point to repeat is that the time for such a debate to start is now and this is simply a requirement if the ethical and welfare issues associated with such work are going to keep pace with research. Idealistically of course, many would consider it desirable to see such debate remain ahead of scientific progress.

www.sciencemag.org/content/340/6128/32.short

Recent Articles of Interest

What if Extinction is Not Forever?

Although new technologies may make it possible to bring extinct species back to life, there are ethical, legal, and social ramifications to be addressed.

www.sciencemag.org/content/340/6128/32.short

(See the previous Editorial on this contentious topic.)

Of Men, not Mice

A recent study showing that mice do not reproduce the patterns of gene expression induced by human inflammatory disease has provoked renewed discussion of the validity of animal models in

translational research. Animal models have long been important for dissecting the underlying mechanisms of many human diseases, as well as in transitioning promising candidate therapies from bench to bedside. However, there is a growing awareness of the limitations of some widely used disease models, a concern reinforced by a recent systematic study comparing transcriptional responses to inflammatory insults in mice and humans (Proc. Natl. Acad. Sci. USA 110, 3507–3512, 2013).

http://www.nature.com/nm/journal/v19/n4/full/nm.3163.html?WT.ec_id=NM-201304

Into the Minds of Birds

A decade ago, researchers might have been surprised that scientists would bother studying the minds of birds intensely. Members of the avian family were once dismissed as "bird brains" and regarded as mentally simple. However, a new brain scanning method may spur the already booming field of bird cognition, and help illuminate a long-term debate over animal capabilities. PET scans of live birds offer a glimpse of their brains in the act of working, and may offer clues to when-or if-a bird is "thinking."

<http://www.sciencemag.org/content/341/6141/22.short>

When Animals Mourn

Animal behaviourists have traditionally shied away from attributing human emotions, such as grief, to responses by animals. But a growing body of evidence indicates that species as diverse as cats and dolphins mourn the passing of relatives and close companions. These observations suggest that although the ways in which we mourn may be uniquely human, our capacity for grief has deep evolutionary roots.

http://www.nature.com/scientificamerican/journal/v309/n1/full/scientificamerican0713-62.html?WT.ec_id=SCIENTIFICAMERICAN-201307

Experiments Reveal that crabs and Lobsters Feel Pain

Crustaceans are generally not protected by animal welfare laws, despite huge numbers of them being caught or farmed for human consumption. The exclusion has been based on the belief that these animals cannot experience pain. Every year

thousands of them are boiled or torn apart while they are still alive, and now there is strong evidence to suggest that crustaceans do experience pain.

http://blogs.nature.com/news/2013/08/experiments-reveal-that-crabs-and-lobsters-feel-pain.html?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+news%2Frss%2Fnewsblog+%28News+Blog+-+Blog+Posts%29&WT.ec_id=NEWS-20130827

NIH to Phase Out Most Chimp Research

Chimpanzees are not necessary for almost all biomedical research, NIH Director Francis Collins said last week in announcing the agency's plan to retire all but 50 of the 360 animals it has available for research. Few, if any, invasive experiments will remain. Eight noninvasive behavioural and genomics studies can continue, NIH said, but only if the chimpanzees are kept in appropriate conditions, such as in groups of at least seven animals, in large outdoor spaces, and with room to climb. The decision comes after years of debate. Explaining the decision, Collins said that chimpanzees share 98% of our DNA, and "they deserve special respect". Reducing their use in research is "scientifically sound and the right thing to do".

<http://www.sciencemag.org/content/341/6141/17.short>

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