It is both a great honour and a challenge to introduce this issue of *Annali dell’Istituto Superiore di Sanità* on applied bioethics in animal experimentation in Europe, particularly because Italy, despite its status as one of the founding members of the European Union [1], began to seriously address the psycho-physical welfare of laboratory animals only relatively recently. In fact, as in most Mediterranean countries, the relationship between humans and animals in Italy cannot be fully understood without taking into consideration its roots in the country’s socio-cultural background. In particular, what can only be defined as a sort of “machismo” has had ramifications on the relationship between humans and animals that go well beyond the practices of hunting and trapping and their consequences on avian and mammalian species. In fact, this socio-cultural background can be considered as one of the underlying factors in the six-year delay in implementing EEC Directive 86/609 in Italy [2], which was given effect only in 1992, with Legislative Decree 6/92 [3], constituting the first step towards establishing bioethically-grounded laws for protecting the psychological and physical welfare of laboratory animals.

In light of the continued expansion of the EU and the consequent increasing socio-cultural diversity, especially considering the imminent inclusion of such nations as Turkey, it will become even more important to consider the various countries’ attitudes towards animal welfare in experimentation and the socio-cultural background underlying these attitudes.

### The Eastern European context

Many laboratories in the 15 EU Member States have established solid professional relationships with laboratories in Eastern Europe, relationships that have
been strengthened by the EU strategy of funding research through multi-laboratory grants. This funding strategy has led to the so-called “laboratories without walls”, in which multi-national groups are being created to address specific priority issues in Europe.

This strategy is also reflected in the establishment of local institutional bioethical committees, whose objectives include that of scrutinising the quality and ethical aspects of animal experimentation. What has emerged is that there are substantial differences between laboratories in Western and Eastern Europe in terms of, for example, animal maintenance overall and such specific issues as cage size and feeding practices. Another important advantage provided by the collaboration between Western and Eastern European laboratories is the opportunity to compare and contrast not only the means of maintaining animals but also those of performing animal experimentation. In particular, neurophysiologists and behavioural pharmacologists can learn a great deal from the technical expertise of Eastern laboratories in terms of both the design and manufacturing of hand-made micro-equipment. In some cases, nanotechnology has been exploited to produce minuscule instruments on a small-scale, which have allowed high-performance recordings of physiological, neurobiological, and neurobehavioral endpoints to be obtained. Most remarkably, the capability to surgically implant this kind of recording device substantially reduces animal suffering. It goes without saying that some of these technological achievements must be introduced in laboratories in Western Europe.

With regard to ethological-type scoring, outstanding standards have been set by numerous laboratories in Eastern Europe, some of which are the direct descents of the renowned Pavlovian school. Among the most active institutions are the “P.K. Anoklin” Institute of Normal Physiology of the Russian (formerly USSR) Academy of Medical Sciences (Moscow); the Biological Faculty of the “Lomonossov” Moscow State University, where the influence of Krushinsky [4] has been of paramount importance; the Nencki Institute of Experimental Biology (Warsaw); and the Laboratory of Neurophysiology of Memory, Institute of Physiology, Academy of Sciences of the Czech Republic (Prague).

The contemporary EU context

Although the general public’s attitude towards animal experimentation varies greatly among EU countries, in part because of socio-cultural diversity, overall the public seems to be quite sensitive to the issue of the welfare of animals in captivity, including those used as sources of food. A recent poll revealed that Europeans, especially the populations of Germany, Great Britain, Italy, and France, have realised the importance of the style of husbandry in ensuring the wellbeing of farm animals (http://europa.eu.int/yourvoice/results/240/index_de.htm). In fact, 80% of the persons surveyed believe that space allowances, the handling of animals, and the means of transport should be better regulated in Europe. Moreover, according to public opinion, the most important aspects of ensuring the proper protection of animals during long-distance transport are watering, feeding, and the use of transport means that are appropriate to the given species.

One of the events that provoked different reactions in the different European countries was the publication of The great ape project: equality beyond humanity [5], which constituted a rather challenging editorial enterprise. The publication of this book was followed by the broadcasting of The great ape trial on national television in the United Kingdom, which, to date, seems to be the most zoophilist country (in fact, the Protection of Animals Act was implemented back in 1911) [6]. In Italy, this book received very negative reviews from both the liberal and the conservative press, confirming that the idea that animals can experience the same intensity, quality, and “nature” of pain as humans is far from being accepted in Italy. For example, in an article published in 2003 in the Jesuit publication La Civiltà Cattolica, it was stated that “...animals do not have rights. Rights are the prerogative of spiritual beings” and thus do not have to be defended by the law [7], indicating that in Southern Europe, which is predominantly Catholic, the notion of even the existence of a common denominator between humans and non-humans continues to be actively challenged. Of course this point of view, which greatly differs from that found in other European countries [8], cannot be considered as reflecting the overall position of the Catholic Church; in fact, Pope John Paul II has expressed considerable concern over animal suffering and human relationships with infra-human subjects.

The Arab and Muslim context

In the near future, Europe will need to expand beyond its ethnocentric attitudes towards the welfare of experimental animals, given the imminent inclusion of Turkey in the EU and the increasing number of scientists from Arab and Muslim nations working in EU laboratories. It is thus essential that the relationship between animals and humans in these countries be taken into consideration. Obviously we cannot possibly do justice to the complexity of this relationship in two or three paragraphs and have thus limited ourselves to indicating below some authors
who can. With regard to the attitudes of Muslim scientists towards animal experimentation, these have been recently reviewed [9], as have the zoo-anthropozoological issues associated with the domestication of mammals and birds [10, 11]. One of the key Arab-Muslim figures receiving increasing attention [12] is AL- Jahiz, a theologian, law-maker, writer, and natural philosopher, whose “bestiary” represents a combination of Arabic and Hellenistic tradition and constitutes the foundation of the Arab-Muslim world’s anthropozoological culture [9, 13]. Other prominent figures who have addressed animal/human relationships are: Abu 'Uthman 'Amr ibn Bahr al-Jahiz, author of al-Hayawan; the Egyptian philosopher/theologian Kamal al-Din al-Damiri, author of Hayat al-Hayawan (The life of animals), and Abu Bakr al-Baytar. On an anecdotal note, of interest is an occurrence dating back several decades, when the late geneticist JBS Haldane moved both his animal laboratory and The Journal of Genetics from the British Isles to India, a country whose population is highly respectful of animal life [14, 15].

**The international context**

In the past 30 years, many attempts have been made to establish common bioethical standards at the “supranational” or “international” level, and the scientific community has demonstrated a willingness to seriously improve the standards of treatment of nonhuman subjects used for experimentation, as indicted by the creation of such journals as Animal Science (first published in 1959), Laboratory Animals (1967), Lab Animal (1972), Anthrozoos (1987), Animal Welfare (1992), and Lab Animal Europe (2000). Moreover, in the past 10 years, many scientific societies and professional biomedical journals have established ethical committees whose objectives include that of reviewing standards for animal experimentation. It is also worth noting that journals that include that of reviewing standards for animal experimentation, as indicted by the creation of such journals as Animal Science (first published in 1959), Laboratory Animals (1967), Lab Animal (1972), Anthrozoos (1987), Animal Welfare (1992), and Lab Animal Europe (2000). Moreover, in the past 10 years, many scientific societies and professional biomedical journals have established ethical committees whose objectives include that of reviewing standards for animal experimentation. It is also worth noting that journals that

In the professional world of neuroscientific societies, the International Brain Research Organisation (IBRO), a multinational organisation dedicated to the promotion of teaching, research, and communication worldwide and representing the interests of 51,000 neuroscientists in 111 countries, has established an Animals in Research Committee, with several regional committees. The current priorities of IBRO include that of standardising the teaching of animal welfare and care at the most humane level possible, with such initiatives as, for example, the establishment of courses in South America and Africa.

**The concept of animal suffering.**

The fragile environment of Marian Stamp Dawkins

Charles Darwin himself wrote that naturalists “do not yet agree on what progression is”, from the standpoint of evolution as the emergence of human-like capabilities that separate human beings from “Beasts”. We refrain from reductionist approaches that attempt to disentangle the process that leads “from the fish to the philosopher”. Evolution, which in all likelihood is not gradual, is not a simple process of increasing neurobehavioural sophistication reaching its climax in *Homo sapiens*. Nor does neurobehavioral sophistication strictly depend on the number of DNA pair bases that a species has in common with *Homo sapiens* or on being equipped with an agile prehensile hand, or even on the number of neurons contained in the brain’s white matter.

According to Marian Stamp Dawkins [17], the actual complexity of human feelings (including pain) can be viewed as the capability of the self-aware animal to understand its world and to possess a realistic representation of its internal and external environments [18]. When the external milieu is challenging and the challenge is enough to provoke physical or psychological distress, the animal may “suffer”. At the centre of this definition of “suffering” lie the coping capabilities on which a given species relies in attempting to control noxious stimuli. In this light, the most convincing definition of “suffering” is the possibility to imagine a strategy for coping with noxious stimuli and, conversely, the awareness of the impossibility of avoiding suffering by coping with the situation.

This issue of *Annali dell’Istituto Superiore di Sanità* critically evaluates the progression (and, in certain cases, the regression) in the ethical relationship between humans and animals (i.e., between biomedical researchers and laboratory animals). The main goal of this publication is in fact to provide a basis for an in-depth discussion of highly debated topics in the contemporary bioethics of animal experimentation [19], with particular focus on ethological issues and the question of minimal sample size and its contribution to reducing the number of experimental animals. The ethological issues addressed in this publication cover all behavioural patterns specifically moulded by the phylogenetic and ontogenetical history of a given species, a perspective that is often neglected when discussing the promotion of animal welfare [20-23].

Giving voice to voiceless animals by attempting to interpret their signs of distress and ultimately reduce their psycho-physical suffering is fundamental for those of us working on experimental subjects [16, 21, 24-26]. The editorial strategy of the present issue was
that of calling upon, as contributors, a variety of human actors in the laboratory environment: from the Chief Animal Keeper of the Istituto Superiore di Sanità, Angelina Valanzano, who is endowed with not only a high level of expertise in the treatment of laboratory animals but also with a great amount of enthusiasm for “those pet-like entities that eventually experimental animals” can become (see [27]), to an expert in statistical analysis, Flavia Chiarotti, who in this issue focuses on the 3R strategy (reduction, refinement, and replacement), to a primatologist dedicated to the ethics of animal experimentation, Augusto Vitale, former President of the Italian Primalogical Association.

Cross fertilisation.
From experimental to farm and zoo animals

At the end of the Bibliography, we have provided a list of some important publications from the past ten years [28-35], publications that bear witness to the changes in the sensitivity of both the scientific community and the general public, which have resulted in substantial improvements in the standards of treatment of farm and zoo animals. It is our desire that the know-how produced by those of us working on laboratory animals be fruitfully exploited by veterinarians and the managers of organisations so as to improve the standards of living of all animals maintained in captivity.

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REFERENCES


