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Ethics and Experimental Medicine Progress

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Introduction

According to Larousse Encyclopaedic Dictionary (Ed. 1987), "Ethics" is defined as a doctrine of humans' happiness and the means to access to this aim. It is also a specific teaching of the rules of living. As to Bioethics, it is considered as the "science of the medical morality". "Progress" is characterized as a movement ahead and is supposed to contribute to increase human welfare. "Experimentation" consists in the use of due techniques in order to try to prove the rightness of a new proposal, to verify hypotheses. A hypothesis itself is defined as a proposal coming derived from observation or induction and necessitating verification, from which consequences may be draught. We shall not discuss the definitions, but only some situation developing during the last years in relation with the rising influence of so called ethic pressure in most of the medicine domains. This situation may interfere with the real possibilities for experimental medicine going ahead, with further development and hence probabilities of significant discoveries, innovations, inventions allowing mankind to progress. Presently experimental medicine domain includes both human and animal sphere.

Experimentation on Human

On one side, we can consider that any medical act is a kind of experiment, as far as we never know exactly what it may lead to. We hope and do our best for obtaining the best possible effect or result with a minimal risk for the patient. On the other side, experimentation on human, i.e. elaboration and statistic verification on humans of action and efficiency of drugs, methods or protocols for investigation and treatment, has been submitted to precise laws everywhere for many years. This significantly limits the danger of abuse but it also may slow the application of interesting and promising innovations. However, a possibility of trying something new, not studied enough, but promising, always exists, thanks to the notion of "compassion experimental protocol". It means that in desperate cases, when there is nothing to be lost, you have the possibility to try something new, out of the usual frame (under certain conditions such as informed consent of the patient or his family or tutor). So experiments on humans, though considered as prohibited, may take place and contribute to advanced research in medicine (we shall not consider the "experiments" practiced during the 2d world war and condemned by Nuremberg International Court because they have almost nothing in common with medicine and represented a kind of torture).

Experimentation on Animal

Experimental medicine is tightly linked to the use of animals in order either to understand physiology, morphology, pathology or to try different ways and means for the treatment of different defects, lesions, diseases. It implies the creation of animal models of human pathology, as well as elaboration of specific methods for investigation and treatment of these pathologies, and also statistic verification of their efficiency before applying to humans. Experiments on animals have been reported since antiquity. Let us remind, for instance, the investigations of Galen (Gallienus) on dead monkeys. During the middle Ages, in spite of the Church impregnation of the civil society and the domination of scholastic teaching, such authors as Bacon [1] reintroduced the experimental science. At this moment experiments on animals might be without problem, as far as animals were considered as beings without soul. Experiments on animals are mentioned in the works of eminent scientists and philosophes as Bacon [2]. Even in the 17th century animals were declared "deprived of conscience and sensitivity" (Malebranche) [3], though Rousseau did no longer share this opinion [4]. The great expansion of the animal use for experiences has mainly begun in the 19th century. It is to be underlined that the basic knowledge of our contemporary physiological, macro and micro morphological sciences was obtained thanks to "vivisection": the first anaesthetics (ether, chloroform, N^2O) were introduced only at the end of this 19th century. Moreover, some phenomena had to be studied in awoken situation (see the works of Bernard, Sechenov and Pavlov [5-7], but also Pasteur [8] and many others). Let us also remind that the main successes in reconstructive and transplantation surgery obtained in the 20th century are exclusively due to animal experimentation. Most of known drugs and investigation methods used to-day in medicine were also verified first on animals: all the medical disciplines are concerned with it, and many next advances will remain dependant on animal testing as the ultimate step before translation to human applications.

The researchers were always aware of the animal suffering, have tried to limit it. There are several examples of the public expression of their thankfulness and tribute to their animal collaborators. For example, there were monuments erected on the initiative of some eminent scientists to the dog and to the rat (Figures 1 and 2).

Since the second half of the 20th century, animal protection has acquired legal forms which extend to scientific experimentation: the Convention of Helsinki (1975) instated very wise and pertinent rules and directives. Later, especially in the 21th century, Commissions and Committees of Bioethics were created everywhere, rigid laws with obligatory normative were adopted and imposed. Strong control was established on animal houses and animals users – industrial as well as scientific ones. It was pertinent, taking into account some abuses having taken place, and may be considered as a progress in human sense and conscience.

Figure 1: "Baikal", one of the dogs of IP Pavlov conserved in the Pavlov Museum of Riazan (Russia). See the cannula placed in the saliva gland duct for the study of the digestive glands function and "conditioned reflexes" that conferred to Pavlov the Nobel Prize in 1905. A monument showing a scientist with his dog existed in the patio of the Academy of Sciences Institute of Physiology in Leningrad (presently St Petersburg) in the 60's.

But recently some questions arose:

Various animals are considered differently depending on the affective links of the population with some of them. However their suffering exists at every level: in Zebra fish and in rats and mice, as well as in dogs, cats, sheep and other pigs. Happily, it is still possible (hypocrisy?) to work with some animal species.

The majority of the members in Bioethics Committees are selected out of the scientific or the medical world, in order to ensure an objective judgement of the presented requests.

The researcher has to expose his topic in such a way that anyone may understand it. It is probably right. But he has no possibility to defend and explain his request. Moreover presently the Committee is empowered to examine not only the respect of animal welfare, but also to decide the pertinence of the planned research and then to give or to refuse the permission for starting a scientific work which does not seem clear enough, or looks too fantastic or anything else. Committees can also impose a modification of the request that seems wise according to the principle of cautiousness, but causes slowing of the work and multiplication of experiments. So the investigator, though keeping the responsibility for his work, may lose the possibility of working as he knows to be necessary.

I suppose that in different countries and different institutions these administrative organs may react in different ways, that exceptions may be elaborated (or somewhere have always existed), adapted for initial research, when the investigator follows a new idea, has to seek for new investigation methods as means to reach the problem, to verify the idea pertinence. At this first step he must have the liberty to work without any fixed protocol unless he respects the Bioethics rules. After trials and errors he will be able to decide (and to prove) whether the investigated direction is worthwhile to be developed or not. Then the investigator is able to present an elaborated structured protocol or give up the idea. And this concerns his responsibility.

Figure 2: Sculpture of Andrei Kharkevich erected close by the Russian Institute of Cytology and Genetics by Novossibirsk in commemoration of the help of the laboratory animals in human research for to understand the nature and the function of living beings.

Up to now our scientific society has lived according to the rule:" what is not forbidden is allowed"; then the way for creativity and discovery remains open. But are we not presently driving or drifting to a system when "what is not allowed is forbidden"? Is it not a real danger for the freedom of thinking, of creation? It is known that the necessary features of a scientist (as well as an artist) are cleverness, fantasy and selflessness. It is also admitted that success in scientific research is due to both liberty of the research and its internationalization [9]. In the beginning of the last century the great French mathematician Poincarré [10] declared that "if the though submits itself to any dogma, it stops being". Are we going back to a unique thought, when we all think the same, act the same, otherwise one might be considered as heretic and likely to be eradicated???

And we have recent proofs of the negative influence of dogmatic positions leading to science progress slowing. The moratoria on the embryonic and foetal material investigation having existed with more or less intensity during 32 years in the west hemisphere [11-12] has led to significant slowing of the research and knowledge not only in developmental sciences but also in the regenerative medicine progress [13-16]. Besides, it is true that the moratorium has encouraged the in vitro research about stem cells and boosted "bio industry". So that

finally, life is more complex and more inventive than human kind imagines and Thought cannot be domesticated.

There always have been people and movements to condemn any experimentation including animal one and even for different motives: religious (during the Middle Ages and Renaissance), ethics (nowadays). May be it is simply the expression of the common fear of what is new, unknown and consequently potentially dangerous. But, like some medieval philosophes and scientists or, more recently, USA researchers in California who pursued their investigations on embryos in spite of the Moratorium, there will always be people ready to risk, even if their lives are at stake, for what they conceive as being a way forward to some progress. But we cannot be indifferent.

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