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### Zoonosis and Orphan Drugs (\*\*)

The classical concept of orphan drugs, if interpreted in the strict sense, does not fit with the major needs of those who have other priorities, connected with the most important endemic diseases.

This does not mean that the research performed in developed countries may be extremely useful also for developing ones. On the other hand, the research performed for drugs against the diseases which are endemic in the developing countries, is necessary for the therapy of diseases imported into developed ones.

The fact that developing countries are poor, and consequently do not constitute a sufficient market, is not always a valid motivation. First of all for ethical reasons. Secondly, international aid is often able to furnish those goods which are not available in developing countries, and this goes from food to drugs. I am sure, for example, that when the vaccine for malaria will be available, resources will be available for its use on a large scale. And this will not happen exclusively for humanitarian reasons, but also because of the strong interest of developed countries to reduce the scourge of malaria. The example of smallpox is paradigmatic.

The market of some drugs may be greatly enlarged if extended also to the veterinary field. Let us take the example of hydatidosis, which is widespread in the Mediterranean and many developing countries. Taking the example of Italy, hydatid cysts are found in about 1,000 persons each year, and this low number creates some problems for the development of a drug. But if the drug can be used also in animals, the problem may change radically, as hydatid cysts are present in about 2 million Italian sheep, with an economic loss of about 20 million dollars.

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(\*\*) Presented at the International Meeting « New Strategies for Orphan Drugs » (Rome, 8-9th March 1985).

The instances in which animal diseases may contribute to enlarge the market are many, not only in developing countries. Let me mention trypanosomiasis and other haemoprotozoal diseases, toxoplasmosis, and others. Obviously, it must be remembered that a veterinary product must be not only effective, but also safe for the consumer. Other considerations, connected with the extension of the use of drugs from the human to the animal field, are connected with the formation of drug-resistant strains.

A fundamental need for developing countries is the development of drugs whose price is accessible to the purchasing capacity of these countries and of international help. As a consequence, efforts should be performed to reduce the costs of existing drugs, and to develop drugs with low price, also if effective ones are already available but with prices which are too high for local economies and for international help. Surely, Professor Marini-Bettolo will have some comment on this item, derived from his large experience in traditional medicine.

Another fundamental need is the development of products which may be used under local conditions. There is, for example, a strong need for the development of vaccines which may be employed without cold storage. And this is true not only for human vaccines — Professor G. Penso mentioned the one against poliomyelitis — but also for animal vaccines, as, for example, the one against rinderpest, rabies and foot-and-mouth disease.

As a final point, I would like to mention the necessity to develop products for vector control which are safe for the environment. Very often the products which are used for controlling vector arthropods and molluscs prove to be devastating for the environment. If used on food-producing animals, these products should be safe also for the consumers. Special attention is due to the biological control of agents and vectors. For example, the action against the vectors of malaria undertaken by our group (Laboratorio di Parassitologia, Istituto Superiore di Sanità and Istituto di Parassitologia, Università di Roma) in Burkina-Faso is based on the following items:

- 1) a traditional type of action, based on the indoor spraying of residual insecticides;
- 2) larval control operations, based on the use of biological products, such as *Bacillus thuringiensis* H-14;
- 3) larval control at community level using biological methods.