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LA CONTINUITÀ DEL VIVENTE
TRA ONTOGENESI E FILOGENESI

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Welcoming Address

An important aspect of modern biology is, with no doubt, the genomics. But this is not reduced only to basic research such as sequence identification of nucleotides in a single gene or in the entire human genome or of *Drosophila* (recently also in other models: the small crucifera *Arabidopsis thaliana*, the small fresh water fish *Danio rerio* and the small nematode *Caenorhabditis elegans*), as well as the insertion of a gene foreign to the genetic patrimony of a cell. The genomics is therefore becoming more and more the study in which coded information in genes is expressed, thus contributing in determining the structure and function of the organism.

Of great importance on this subject is the study of gene expression. Studies revealed that genes transcribed in the first phase of development act as selectors of alternative sequence expression of other genes, bringing forth progressively complex animal forms or plant species.

At the end of the last century a new field of study begins, that of evolutionary developmental biology in which two areas of research, in the past autonomous and not connected to one another, that of evolutionary biology and developmental biology, meet.

Developmental biology, based on the study of molecular and cellular mechanisms, responsible for the differentiation and morphogenesis, has greatly contributed to the understanding of “continuity” between development and evolution.

The National Academy of Sciences dedicates this day to Evolutionary Developmental Biology, in the hope of stimulating greater interest in this area, in Italy. In view of the fact that in other countries this area of biology is present in many university programs and in many specific international magazines.

The conference will begin with a short historical introduction and will follow with three presentations on the topic: “The continuity of the living, between

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ontogeny and phylogeny”. Giuseppina Barsacchi will illustrate one of the most complex and debated problems, the development and evolution of the eye, clarifying the genetic network of the intrinsic and extrinsic signals that control the determination and differentiation of the retina. The other two presentations, by Wallace Arthur of Sunderland University in England and by Alessandro Minelli of the University of Padova, will present in two different point of views, a more general lecture of the evolution of organisms, seen in light of developmental biology in its conservative aspects which suggest the existence of internal functional constraints in which Arthur refers to as “developmental re-programming”.

In this last concept Arthur includes the changes of the individual during ontogenesis expressed from four “dimensions”: heterochrony, heterotopy, heterometry and heterotypy. Inside these “dimensions” of the body, the structural complexity to be reached does not exceed, as far as Minelli is concerned, a limited value in that the organization of the living would be subject to constraints that guarantee structural invariability or stability.

Moreover, Arthur believes that these constraints could be “put back into discussion”, so as to give form to new organizational plans.

On behalf of the National Academy of Sciences, please accept my warmest wishes for a successful meeting.