

### **Historical review and technical progress in upper limb prosthesis.**

In spinal cord injury the transmission of centrally generated signals to the peripheral motor target, is of highest interest from a scientific and practical point of view. The contrary, transmission of peripheral sensory signals toward the central nervous system has a even higher interest today.

Both of these two scientific topics are based on the interface between biological cells at the one hand and technical developments on the other hand.

For the extremities it is true that prosthesis have made a great progress in the last decade. The miniaturization of computers and their explosive development in the field of velocity and capacity has permitted to produce miniaturized computers which can be implanted and which are capable to provide enough information to guide these prostheses.

On the other side many other technical evolutions, for example those of portable telephone technology, have permitted to transmit signals easily, to have long-lasting batteries and many more. This technical progress, connected to other progressing fields such as the pneumatic and hydraulic technology, has permitted the development of astonishing, well functioning prosthesis, which make the bionic person a more realistic future prospective.

Still the interface between these two systems remains a much more serious issue. As we know we can detect brain sequels by electrodes and transport variations of these signals to a computer, which is then able to recognize this and elaborate this in valid information. By a principal the same is true for the contrary sensory side.

The aim of our session and of my contribution is to make a state of the art of the actual situation on the technological side. The other shall give an overview and an inside view about the computer-brain interfaces and their progress.