

TOWARDS A NEW NEURAL TRANSMISSION BIONIC STRUCTURE

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ABSTRACT

The object of the study that I present here has a systemic content and contributes to Systemics, in particular in the following sectors:

- Cybernetics, Automata, Robotics
- Systemic and medicine

The object of this study was to create an elementary electronic circuit which can produce signals that are similar to those produced by intracellular and extra-cellular circuits.

Our results, obtained in the course of several experiments of computerized circuit simulations, are comparable to those produced by neural circuits that are described in the literature. Based on these results it is our belief that we can create bionic (artificial) cells which can functionally act like stem, glial, or other kinds of biologic cells.

GENERAL PURPOSE

Seeing that in this study we want to show how we can produce physiological signals and, obviously, therapeutic countersignals, the purpose is to assert that we can act in an invasive way at an almost cellular level, with replacements or by-passes on clusters of neurons, that are damaged or blocked by internal or external causes.

The installation of artificial nervous cells, mainly produced with nano-technology methods, can be a new way to regenerate nervous faculties which can be compromised in various ways: it would be enough a localized injection of opportunely programmed nano-bionics cells, to restart the circuits, all or in part blocked.

We think that, in this way, we can have the same effects of traditional medical treatments, with the knocking down of direct and indirect costs, due to the management the ready intervention and of the following phase of determined pathologies.

POSSIBLE APPLICATIONS OF THE RESEARCH

Here I present a project which deals with the realization of:

- an artificial brain, or its principal components, and the various peripheral nervous components, in order to contribute to the cure or the recovery of some invalidating diseases like Tetraplegias, Parkinson, Alzheimer, Stroke, Epilepsy and other.
- and a parallel super computer, whose basic structure is the modified human brain;

In several years of research, after having calculated the gamma of the interconnecting frequencies of a lot of neuron-conductors and determined the general proceeding, I have ideated and realized an inedited and revolutionary model for the mathematics and informatics simulation.

Starting from this I have realized the electronic-informatics simulation of the first 17 prototypes (Note: now 20 in 36 versions).

The assumption is that a particular double face device has to be realized:

- From the point of view of the computer and telecommunications, it has to function as an extremely powerful super parallel computer;
- from the point of view of medicine, it has to work as an external (and-or internal) by-pass which can activate the biochemical interconnections among the deficient neurons.

In the following, the realized devices can be subjected to a process of nano-technology in order to obtain a central nucleus with ramifications, which leads to:

- from the point of view of medicine, the realization of a whole nervous bionic system to use totally or in part (at a biologic speed and with biological parameters). We can easy think to medical solutions and above all to a synergy with the actual proposal of stem and glial cells.
- from the point of view of the computer and telecommunications, the realization of a real artificial brain with branches which can be connected either by the artificial or human user parts (a real artificial nervous system which can work at the speed of light).

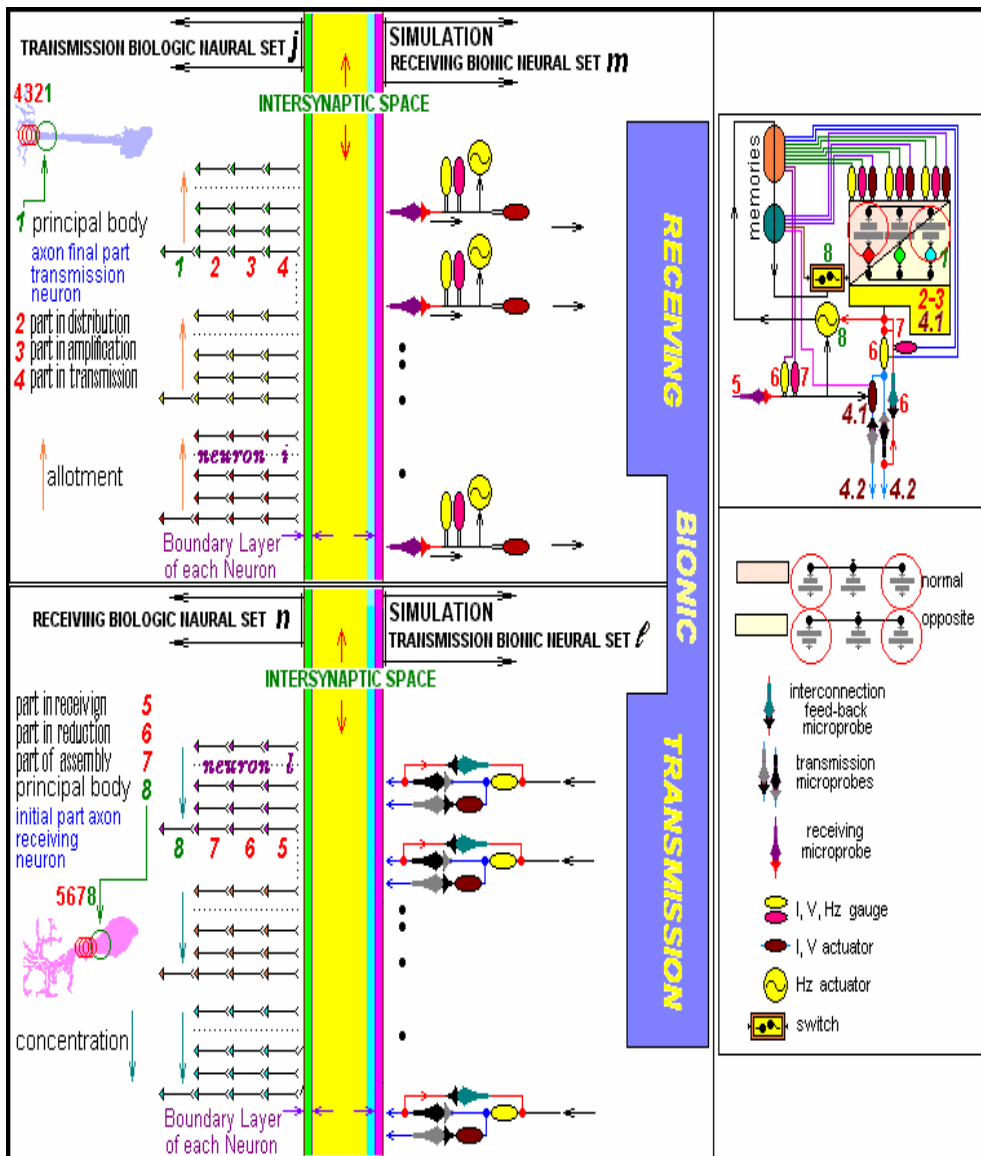
I must add that this project leads to the complete upsetting of the actual operative philosophy in the realization of computers and in the realization of bionic elements, which are manageable and interchangeable.

We assume the point of view of pc and telecommunications too, because the projected electronic-informatics modules have analogical-digital converters, and they can be also configured exactly like Chips.

From this, the possibility of tele-control.

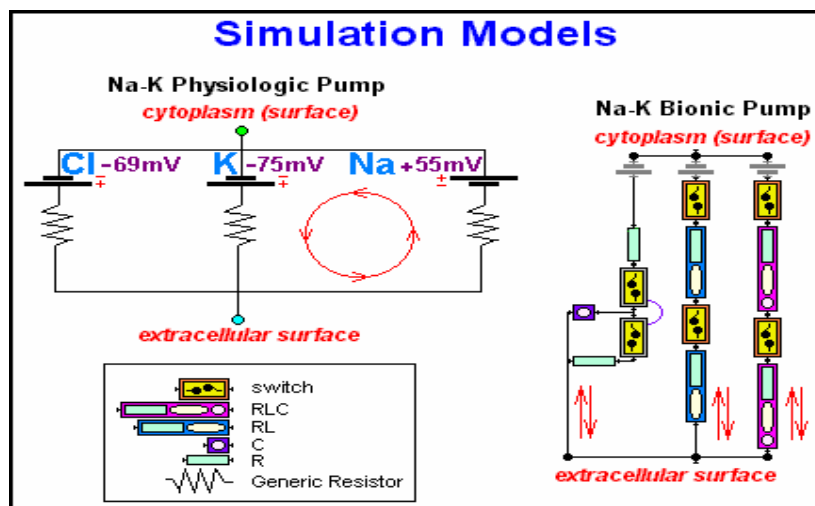
After all, the device is projected to cure and/or manage (f.e. tele-cure and/or tele-managing) the interested pathologies.

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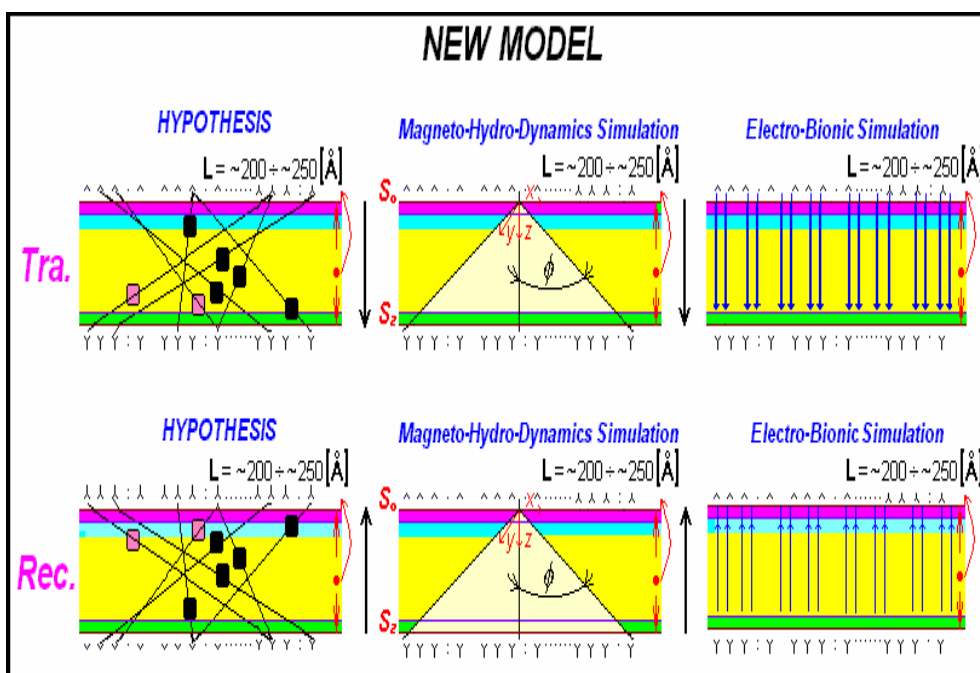
from Errigo's conferences, 1987-1994

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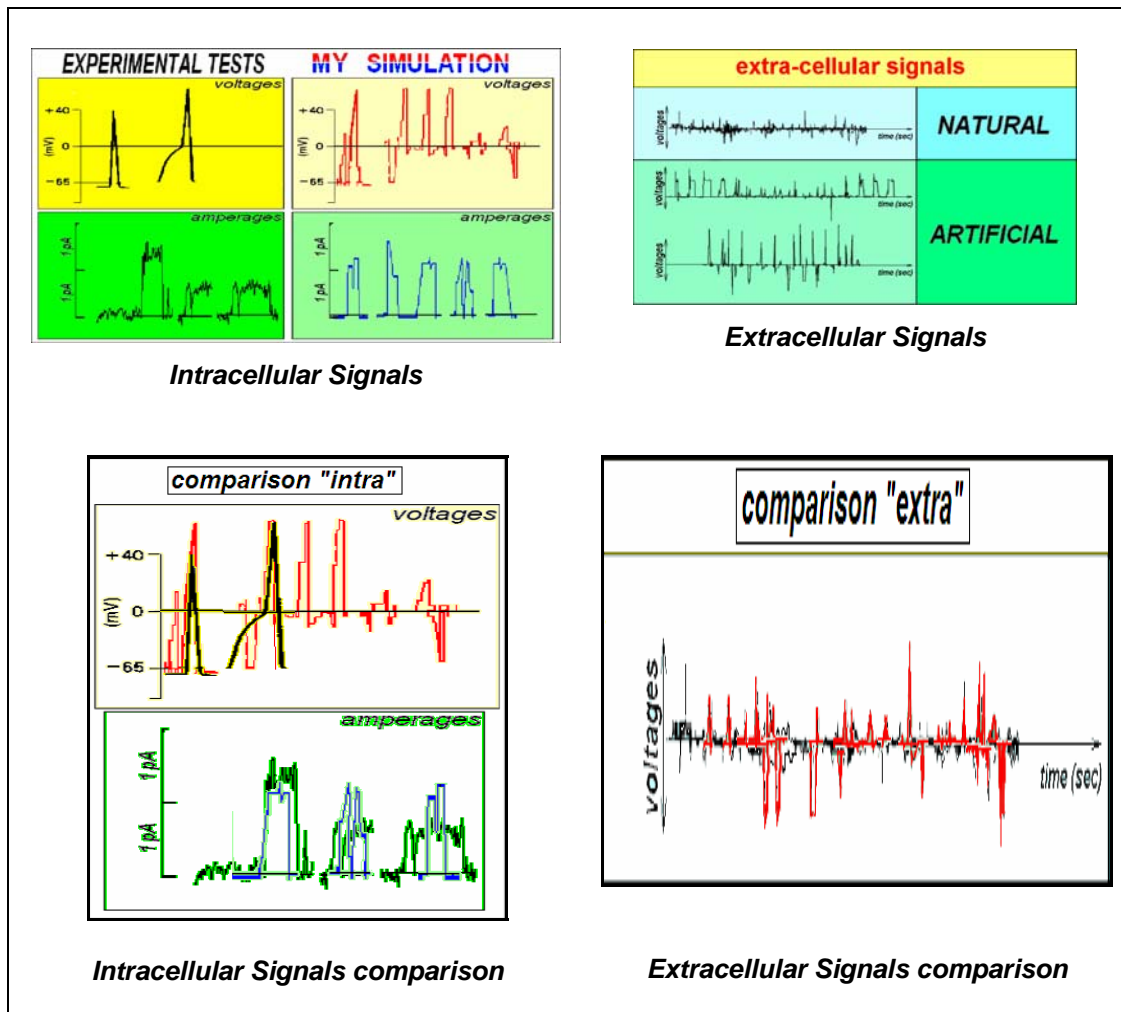
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NOTA

La struttura iniziale è la base fisica dei “domini cognitivi” e di essi viene fatta ampia menzione in tutta l’opera **Cyber-neurophysiology** trattandone tutti gli aspetti derivati.

Per la definizione utilizzata di “domini cognitivi”, esistono in letteratura numerose varianti:

- Secondo F. Varela sono “micromondi”.
- Secondo M. Arbib sono “schemi”.
- Secondo M. Minsky sono “agenti”.
- Secondo G. Edelman sono “gruppi neurali”.
- Secondo P. Churchland sono “prototipi nello spazio delle unità nascoste”.
- Secondo C. Tart sono “stati di coscienza”.

Comunque vengano chiamati, costituiscono la base fondamentale per la struttura della mente e della coscienza, trattandosi, in definitiva, di **“piccoli io momentanei”** a guisa di sorgenti e di conduttori di centri emozionali, motori, intellettuali o logico-simbolici, sotto i profili ontogenetico e filogenetico.



Questa immagine è tratta, con modificazioni, dalla Quarta Parte dell’opera **Cyberneurophysiology**.

Rappresenta come artificialmente possono essere riprodotti i **“piccoli io momentanei”**.

Tutta la Quarta Parte è uno sviluppo dell’idea della coincidenza e dell’identità tra l’artificiale ed il biologico in questo argomento ancora oggetto di ampia riflessione scientifica, cibernetica e bioetica; o meglio **BIONETICA**.