IV. SETTLERETICS RESEARCH PROGRAM. [1]

Annotation. ***Provide the guidelines in Settleretics research program (science for transferring the information substance of the character and consciousness of aging brain in young backup carrier in order to achieve practical immortality of the individual). It is recommended to be funded and conducted activities aimed on obtaining an information from nerve cells ("uploading"), by way of: a) installation of a sensor-«spy» in each nerve cell; b) usage of the resonance-frequency behaviour of dendrites and axons of nerve cells.***

The Settleretics [12, 13], as an interdisciplinary science for the continuous and regular „settlement" (i.e. transfer of an information substance) of the mind and personality of the aging brain in spare brain (a young body brain – a bio-clone or artificial neuro-cybernetic brain of a cyborg), in order to achieve practical immortality of the individual, sets as its first task to find appropriate methods for taking down this information (so called «uploading» into alien sources, see note [13]). (The task of the second tier - the information to be recorded on natural or artificial carrier (so called «downloading»), the science settleretics is predicted to take place in the middle of the XXI century, i.e. at the time of the creation, by scientific and technical progress, over sufficiently powerful and reliable opto-neuro computer [8, 9, 17] systems.).

In this work, we would like to draw attention toward the possible approaches of solving the first task.

As one of the possible versions of schemes for such a research, we would like to offer the classic cyber scheme of «the black box» but related to the specifics of the research process. For a system which is to be a subject of examination should be selected a classical nerve cell of a squid or a snail, and as for the information which is to be «download» – generated and accepted by it inter-pulse intervals [7]. The data is downloading in a conventional manner – by insertion of electrodes [14]. The model of the system is built up by the available mathematical methods. We assume that the method we have at our disposal will allow to decompose the counted and final set of algorithms for the functioning of the neurons' bodies and to transfer in the model of neuro-cyber system, i.e. figuratively speaking, «to turn the black box into white». For verification we will use a snail again, but already managed by the resulting model.

If the mathematical model demonstrates its adequacy its application should be expanded through noninvasive monitoring of the nerve

processes. All present known types tomography as (X-ray, ultrasound, thermal, magnetic resonance, positron emission, etc.) either do not have sufficient resolution (show more «view of the city seen from the plane», although most modern devices with magnetic resonans reach resolution of 0.05 mm^2), or receive authorization from the static and dead stuffed cell or solve inverse problems, restoring output information in the diffraction pattern, but losing in this piece of information. On the other hand, it could not be possible to put in every cell a glass or a metal electrode from outside.

This contradiction (either to have or not to have a sensor in each (!) nerve cell) as it is suggested in TRIZ [1], can be solved by inserting enough miniature sensor-«spies» which to fall into the membranes of the bodies of all the neurons inside (i.e. in natural way through the bloodstream). These sensors-«spies» have to attached themselves to the membranes of the bodies of the nerve-cells and to send radio signals outside the skull (or to comply with such modulating the external carrier frequency), tracking the changes in the electrical and chemical transformations of the nerve cell activity. It remains one to be done - to be created such a sensor-«spy».

It is well known the announced release [15] on the successful studies conducted by researchers at the University of Michigan, where in the membranes of a sensor cells are introduced (shoot) artificial polymer sensors with a diameter of 20 nanometers (PEBBLEs). Depending on the chemical composition of the environment, they collected in their microspores a certain quantity of a specific dye added to in advance and so displayed occurring molecular intracellular processes. These studies proved that the very principle for the implementation of a «spy» in the membrane is productive.

The difference in our proposals lies in the fact that we did not shoot the sensor into the membrane (and so do not traumatized it), but supply it with the blood flow. Then use the non-optical method for detecting chemical and electromagnetic. And finally (will) apply this method not to somatic but to nerve cells. As to the previous mentioned scheme "converting black box in white", especially in vitro grown nervre cells this method is suitable even in its current form.

There is another promising method to download information suggested by TRIZ: «using the resonance properties of the environment». Well known are the models for the conduction of nerve impulses, based on «theory of the volume conductor» [3, 4, 5, 18, 20, 21, 23]. According to these models, dendrites (or an axon) are modeling by an equivalent circuit diagram of infinite coaxial cable (***Figure 1.***), which has its own linear resistors **R** and **C**. We capacity to measure and further regard to its own linear inductance **L** of the dendrite/axon, which is not reported to date in any of the known works. This will determined its own resonance frequency. Turning the cable (with the equivalence of the wavelength with the diameter of the line) in antenna transceiver whose radiation is frequency modulated by along passing nerve impulses, we can try to destroy the information input and output without inserting additional sensors-«spies».

We have made an estimate, using described in the literature neuro psychophysical data and models [3, 4, 5, 18, 20, 21, 23] and methodologies for the calculation of radio electronic circuits [2, 10, 11, 16, 19].

Take for «standard» [e.g. 18] for these estimates following output data. Geometric: dendrite with internal diameter **d = 1** ***mcm***, with a relative thickness of the membrane

d

= D/d

»

1.005

, for slice

dx = 0.1

mcm

.

Penetrability of the environment:

dielectric (of the membrane)

e

»

3

, and magnetic (of the ectoplasm and intercellular environment)

m

= 1

.

Electric:

the membrane with the linear capacity

C

0

»

3.1*

10

-8

F/m

, the longitudinal resistance of the ectoplasm with the linear resistance

R

0

»

0.9*

10

12

Ohm/m

, and cross-resistance of the power's leakage of the membrane with the linear conductance

G

0

»

1.6*

10

-5

S

m/m

.

Calculations show that

: inductance passive uniform long coaxial line with losses will be

L

0

»

1.1*

10

-9

Hn/m

. Input resistance

Z

0

»

0.2

Ohm

. The set of resonant frequencies of the dendrite is in the range of

10

13

–

10

15

Hz

(the border pf radio- and opto-ranges), which is not very convenient for the distribution of transverse electromagnetic wave in terms of its large absorption of foreign and «waveguide» reflection (internal) water-lipid environment.

Without prejudice to the operation, to move their resonance frequency of dendrite in handy for us HF/VHF radio range. To this end, may have to change the electrical and magnetic characteristics of the dendrite/axon, and/or its environment with 2 – 3 degrees of magnitude, which is also necessary to conduct further studies. As one of the options could serve «such coating» the bloodstream with ferromagnetic fluid of schwann cell myelin sheaths of axons and dendrites, whose structure [6, 23] is like ready and created by nature itself coil of interest «inductive coil» and/or «cylindrical capacitor».

So, the program for the upcoming research looks expensive and bulky. We see output in system integration. There is no need to invest many millions of dollars in a very close examination. All we have probably already been studied by anyone, but for other specific tasks. In the first stage, the task of researchers will be given access to the network of electronic communications, to track the current state of affairs in this area. Furthermore, you will need to study and scientific journals whose publications is not publicized widely in electronic networks. Once you locate the area of exploration, after, groups and laboratories close to the task, their research will have to be coordinated and for the purposes of the tasks set before us. Based on the seriousness of the tasks we will not require much funding as long as it is directed exactly to the specific objective!

We fully agree with the author [22] that «Russia should have a future», associated with the transition from outdated already «colonial-raw material economy» to the modern and science-intensive production of «goods of the XXI century» - «artificial psyche» for «artificial labor». And even we will add to this place, seemingly fantastic job today, such as achieving practical immortality! But only if that business in Russia be so civilized that want to try to understand it and to invest resources in a perspective of the threshold of the XXI century research.

BIBLIOGRAPHY.

1. ***Альтшуллер Г. С.*** **Творчество как точная наука.** — М.: Сов. Радио, 1979.
2. ***Афанасьев В. В., Веселовский О. Н.*** **Расчеты электрических цепей на программируемых микрокалькуляторах.** ¾ М.:

Энергоатомиздат, 1992.

3. ***Беркенблит М. Б., Глаголева Е. Г.*** **Электричество в живых организмах.** — М.: Наука, 1988.

4. ***Бергельсон Л. Д.*** **Мембраны, молекулы, клетки.** ¾ М.: Наука, 1982.

5. ***Береговой Н. А.*** **Долговременная сенситизация: математическое моделирование процессов в мембранах командных нейронов.** //Нейрокомпьютер. — М.: НЦН, 1992, № 2.

6. ***Блум Ф., Лейзерзон А., Хофстедтер Л.*** **Мозг, разум и поведение.** ¾ М.: Мир, 1988.

7. ***Вартанян Г. А., Пирогов А. А.*** **Нейробиологические основы высшей нервной деятельности.** — Ленинград: Наука, 1991.

8. ***Евтихиев Н. Н., Оныкий Б. Н., Перепелица В. В., Щербаков И. Б.*** **Многослойная нейронная сеть и ее реализация на основе оптического вектор-матричного перемножителя**
//Нейрокомпьютер. — М.: НЦН, 1994, №№ 1, 2.

9. ***Евтихиев Н. Н., Оныкий Б. Н., Перепелица В. В.*** **Щербаков И. Б. Гибридные оптоэлектронные нейрокомпьютеры**
//Нейрокомпьютер. — М.: НЦН, 1994, №№ 3, 4.

10. ***Кауфман М., Сидман А.*** **Практическое руководство по расчетам схем в электронике.** Справочник. В 2 т.т. Т. 2. ¾ М.: Энергоатомиздат, 1993.

11. ***Каяцкас А. А. Основы радиоэлектроники.*** ¾ М.: Высшая школа, 1988.

12. ***Корчмарюк Я. И.*** **Сеттлеретика — новая междисциплинарная наука о «переселении» личности.** (Тезисы докладов.) //IY Всероссийская конференция «Нейрокомпьютеры и их применение» НКП-98, 18 – 20 февраля 1998 г. /Министерство экономики РФ. ¾ М.: НЦН, 1998.

13. ***Корчмарюк Я. И.*** **Сеттлеретика — новая междисциплинарная наука о «переселении» личности?** //Новые информационные технологии. Материалы научно-практического семинара НИТ-98. Московский государственный институт электроники и математики, февраль 1998 г. /МГИЭМ. — М.: МГИЭИМ,1998.

14. ***Ноздрачев А. Д., Поляков Е. Л., Гнетов А. В.*** **Исследования функций головного мозга.** ¾ Л.: ЛГУ, 1987.

15. **Пуля — не дура** ***/Интердайджест*** //«Поиск», № 11 (461), 7 – 13 марта 1998 г.

16. **Справочная книга радиолюбителя—конструктора.** В 2 книгах. Кн. 1 и кн. 2. — М.: Радио и связь, 1993.

17. ***Степанов М. В.*** **Оптические нейрокомпьютеры: современное состояние и перспективы.** //Зарубежная радиоэлектроника: Успехи современной радиоэлектроники. Нейрокомпьютеры и их применение (тематический выпуск). — М.: ИПРЖР, 1997, № 2.

18. ***Стивенс Дж. К.*** **Перспективы нейроинженерии. //Реальность и прогнозы искусственного интеллекта.** ¾ М.: Мир, 1987.

19. Трохименко Я. К., Любич Ф. Д. Радиотехнические расчеты на программируемых микрокалькуляторах.. ¾ М.: Радио и связь, 1988.

20. **Физиология и фармакология синаптической передачи.** ¾ Л.: Наука, 1973.

21. ***Цетлин И. М.*** **Модель таламокортикального нейрона. Количественное описание нейронных токов.** //Нейрокомпьютер. — М.: НЦН, 1995, №№ 1, 2.

22. ***Широков Ф. В.*** **Введение в нейрокомпьютеры.** — М.: Коприс энд М, 1996.

23. ***Шульговский В. В.*** **Физиология центральной нервной системы.** — М.: МГУ, 1997.

[1] ***Корчмарюк Я. И***. **Исследовательская программа сеттлеретики** (Секционный доклад.) //Пятая Всероссийская конференция «Нейрокомпьютеры и их применение» НКП–99. (Научный Центр Нейрокомпьютеров, 17 – 19 февраля 1999 г.) — Москва: НЦН, 1999.

Корчмарюк Я. И.

Сеттлеретика: исследовательская программа.

(Тезисы докладов.) //Четвертая Республиканская электронная научая конференция «Современные проблемы информатизации» СПИ–99. (Международный университет компьютерных технологий, 15 ноября 1998 г. – 30 апреля 1999 г.). — Воронеж: МУКТ, издательство ВГПУ, 1999.

Корчмарюк Я. И.

Сеттлеретика: применение кибернетического подхода к анализу функций возбудимых образований

(Тезисы докладов.). //Там же.

Корчмарюк Я. И.

Сеттлеретика: концепция полуинвазивного метода исследования возбудимых образований

(Тезисы докладов) //Там же.

Корчмарюк Я. И.

Сеттлеретика: моделирование кабельных свойств возбудимых образований

(Тезисы докладов.). //Там же.

Корчмарюк Я. И.

Учет индуктивности в коаксиально-кабельной модели возбудимого образования

. (Тезисы докладов) //Там же.

Корчмарюк Я. И.

Сеттлеретика.

(Секционный доклад.) //Международный симпозиум «Стратегия развития России в третьем тысячелетии» (Неправительственный экологический фонд им. В. И. Вернадского, 20 – 21 октября 1997 г.) – Дубна: НЭФ им. В. И. Вернадского, 1997.

Корчмарюк Я. И

.

Сеттлеретика о новом товаре XXI века – «искусственной психике»

(Секционный доклад.) //Международная конференция «Цивилизованный бизнес, как фактор устойчивого развития России» (Неправительственный экологический фонд им. В. И. Вернадского, 27 – 28 октября 1998 г.) – М.: НЭФ им. В. И. Вернадского, 1998.