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MENTAL TRAINING -

New Paradigm of Development

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KEY WORDS: Mental training, alternative state of consciousness, the third signal system, cultural-ecological space, "golden" section, bioenergetic homeostasis, aesthetics, spiritual life.

The paper deals with some theoretical foundations and concrete ways of the development of mental training integrated methods from a position of humanistic psychology modern theories of the biophysics of psychical activities and neuro-aesthetics. Possible biopower-informative mechanisms of amplification (intensification) of the influence of mental training on the field of human spiritual life and aesthetic ideal of personality are experimentally checked and grounded. A particular stress is laid on a decisive role of common to all mankind cultural values as a basis for the synthesis of the methods of developing psychotraining. A special purpose of developing psychotraining is considered from the positions of the enrichment of personality potential that defines the "inner beauty".

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МЕНТАЛЬНЫЙ ТРЕНИНГ - НОВАЯ ПАРАДИГМА РАЗВИТИЯ

КЛЮЧЕВЫЕ СЛОВА: ментальный тренинг, альтернативное состояние сознания, третья сигнальная система, "золотое" сечение, биоэнергетический гомеостаз, эстетика и духовность.

В работе с позиций гуманистической психологии, современных теорий биофизики психической деятельности и нейроэстетики обсуждаются теоретические основания и конкретные пути развития методов интегративного ментального тренинга. Экспериментально проверяются и обосновываются возможные биоэнергоинформационные механизмы амплификации (усиления) влияния ментальной тренировки на поле человеческой духовности и эстетический идеал личности. Подчеркивается решающая роль общечеловеческих культурных ценностей в качестве основы для синтеза методов развивающего психотренинга. Целевая задача развивающего психотренинга рассматривается с позиций обогащения духовного потенциала личности.

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For the last few years there have undertaken some attempts of studying psychophysiological mechanisms of consciousness and, in particular the alternative state of consciousness (ASC) that are formed in the conditions of meditation, hypnosis and mental relaxation more and more active (Lebedeva N., Dobronravova N., 1990); Sabourin M et al., 1990; Walter H. et al., 1994; Gruzeller J., 1996; Moenar M. et al., 1996 and oth.). It is conditioned not on increased analytical possibilities by modern neuroscience, but also by practical problems.

Health protection and promotion of the population mentalhealth under modern, extremely complicated ecological and socio-economic conditions is one of such problems of global significance. If in this case to take into consideration a specific character of altered states of mass consciousness and some particularities of vital values transformation (Murphy M., 1992; Spivak D., 1996; Astin J., 1997) which are typical of the conditions of modern society, there naturally appears the following question. How to raise the efficiency of psycho-preventive methods in order to promote the human being mental health promotion and spiritual demands?

Today the search of the approaches to solving this problem is widely discussed in literature both in the Western Powers and Eastern Europe, and as a whole it is correlated either with the tasks of valeology (Brekhan I., 1993; Petlenko V., 1996;) or with the realization of physical culture and psycho-physical training humanistic potential (Ageevetz 1996; Bundzen P., 1997 and oth.).

However, it is quite clear that the elaboration of specific methodology of increasing the effectiveness of psycho-preventive technologies is impossible without specially oriented complex psychological, medical and neuro-biological investigations.

A concrete attempt of solving this problem was undertaken by us within the framework of using the well-known technology that's the integrated mental training (Uneståhl L-E., 1996). The investigations developed in the limits of carrying out the joint scientific-research project "Mental training for sport and life" between Scandinavian International University (Örebro, Sweden) and Scientific-Research Institute of Physical Culture (Saint-Petersburg, Russia).

For the purpose of carrying out some parallel cross-cultural investigations both in Sweden and in Russia in 1992-1993 there created a Russian version of mental training (RVMT) which is authentic to the Swedish model of integrated mental training (Bundzen P. et al., 1994). In accordance with

the base model RVMT consists of seven functional blocks including 35 training audio-programmes. The elaborated programmes had a wide approbation in a number of scientific-research centres of Russia (S.-Petersburg, Moscow, Krasnoyarsk, Omsk and oth.), and in 1995 RVMT was certificated by the Russian Federation of Sports Medicine and authorized its use in Russia.

The basic trends of using RMT which are corroborated by the certification include:

- 1) Preventive measures of the phenomena of nervous-psychical stress and personal self-perfection;
- 2) Promotion of psycho-somatic health of the population;
- 3) Mental recreation by pre-clinical changes of nervous-psychical status;
- 4) Development of sports-important psychical qualities in young athletes and the preparation of skilled athletes for competitions.

The effectiveness of RMT under the conditions of systematic training on the duration from 7 till 21 weeks was proved by numerous investigations carried out on pupils, students, adult population and athletes (see Table 1).

The results of these investigations were broadly presented at international congresses and published in periodical publications (Bundzen P., Uneståhl L-E., 1994; Uneståhl L-E., 1996; Vainik G., 1996; Balandin V., 1996; Bundzen P., 1996; Kostyreva T., Kozhevnikov V., 1996; Uneståhl L-E., Bundzen P., 1996).

While summarizing the data obtained in the course of aforementioned investigations we have every reason to affirm that the systematic training which lasts from 6 to 21 weeks provokes the following effects:

1. An antinociceptive effect which directly accompanies the process of mental relaxation and which is reliable revealed during 15-20 minutes after the termination of relaxation. Using the Bold-Ischemic Test in the investigations there showed that the time of the appearance of sensations of pain in the course of mental relaxation increases by 50 % on the average ($p < 0.01$) (Bundzen P. et al., 1996, Isakov V., 1997).

2. The reduction of the level of cortisol, dihydroapiandrosterone and free fat acids in the plasma of blood ($p < 0.05$), that occurs at the moment of mental relaxation and which is reliable revealed in the post-relaxing period ($p < 0.05$). These data testify to a rapid change of the activity of

Adoption of the Swedish Model of Mental Training in Russia

1. **Creation of the Russian Version of Swedish Model of Mental Training / RVSM MT /.**
1991 - 1993, *P. Bundzen, M. Bendjukov, N. Schlyter*
2. **Medico-biological and psycho-pedagogical investigations of the efficiency of RVSM MT in period 1992 - 1997 :**
 - schools providing general education in Krasnoyarsk and St-Petersburg
V. Kozhevnikov et al., V. Balandin
 - Schools of Olympic reserve and National Sports Teams
V. Balandin, N. Bure; V. Zagrantsev
 - Fitness -clubs and Shaping -clubs in St-Petersburg
G. Valnik, I. Maslova
 - students of the Military Institute of Physical Culture and clinical centres of St-Petersburg
E. Gavrilova, V. Isakov
 - rehabilitation of the liquidators of the Chernobyl
T. Kostyreva, V. Kozhevnikov
 - Russia competitions of Beauty, students of institutes
P. Bundzen, V. Medvedev
3. **Certification of the RVSM MT by Russia Sports Medicine Federation and CIS Association of Psychologists.**
L. Markov, A. Rodionov
4. **Inclusion of RVSM MT in courses of practical psychology at the Baltic Pedagogical Academy**
I. Volkov

hypothalamo-hypophyseal axis in the period of mental relaxation; it is in full measure co-ordinated with the dynamics of psycho-emotional status under the influence of systematic mental training (Vainik. G., 1996; Gavrilova E., Isakov V., 1996 and oth.).

3. An increase of the level of beta-endorphin in the course of systematic mental training. The given phenomenon is revealed on the 6th-8th week of using mental training ($p < 0.05$); in this case the maximal alterations of beta-endorphin were revealed when the programmes of basic mental training were combined with the programmes that make up the block of the program "Life quality training". The revealed changes of the level of endogenic neuro-peptide - beta-endorphin explain both an urgent antinociceptive effect of mental relaxation and a resistant anti-stressing effect of systematic mental training (Uneståhl L-E., Bundzen P., 1996).

4. The prevention of immunodeficiency phenomena which develop under the influence of stressorganic conditions in life or as a result of overscience (Bundzen P. et al., 1996; Kostyreva T., Kozhevnikov V., 1996). The results of the investigation carried out with using up-to-date technologies (monoclonal antibodies, complex of immunoglobulins) testify to the fact that the 4-week systematic use of mental training is able to standardize the state of both cellular and humoral immunity. In this case it should be noted that the greatest manifestation of psycho-immunomodulating effect is marked in case of immune function depression, in particular in athletes who have some symptoms of immunodeficiency by the phenomena of overscience.

All above stated testifies to a pronounced stresslimiting and immunomodulating influence of mental training on men's organism.

At the same time it should be noted that from the very beginning of education of joint scientific project the basic accent in the investigations carried out was made on the study of psycho-physiological and neurobiological mechanisms of mental training key link - the alternative state of consciousness which is typical of the conditions of mental relaxation.

The results of these investigations appear to be the base that enables us to discuss possible ways of increasing the proper psycho-tropic effect of mental training.

Taking into account the accumulated by the middle of 90's experience or studying the neuro-dynamic correlates of meditation, hypnosis and self-hypnosis in neuro-physiological investigations we used the computer technology "Brain Electrical Activity Mapping" (BEAM).

The investigations were carried out simultaneously both in Sweden and in Russia by keeping the general demands to the methods of the recording of electroencephalogram and the primary processing of experimental material (Bundzen P., Uneståhl L-E, 1994).

In the course of the investigations there used the method of EEG spectral characteristics mapping (see Fig. 1) and the construction of brain maps of the coefficients of brain cortex local activation along 14 or 15 zones in accordance with the system 10/20. The coefficients of local activation (CLA) were determined according to the correlation of spectral power over the range: theta, alpha and beta of EEG spectre frequencies in the form of the indices $K1 = \text{theta}/\alpha$ and $K2 = \beta-1/\alpha$ (Bundzen P. et al., 1996).

The results of neuro-physiological investigations testify to the fact that under the conditions of the formation of ASC by mental relaxation there occur the following basic alterations of brain bioelectrical activity and the coefficients of local activations:

- statistically reliable intensification of theta activity and alpha-activity over the range of 8.3 ± 0.8 Hz in brain cortex left frontal and antecentral spheres; highly reliable reducing of alpha-activity over the range of 13.0 ± 0.8 Hz in the right retrocentral spheres by a simultaneous rise in the right parital-temporal zone of activity over the range of beta-1 equalization of absolute values of the coefficients of local activation $K2$ both in bilateral and frontal-occipital direction (see Fig. 2).

If to consider these alterations in the continuum of studied functional states (placid keeping awake, muscular relaxation, mental relaxation and so on), then the formation of so-called "smooth" pattern of CLA by the values of $K2$ may be considered to be a *specific neuro-dynamic marker* of ASC. The structure of "smooth pattern" testifies to the appearance of a widely distributed in brain space isogradient activated structure. Isogradient means the equality of relative changes of the level of activation between the studied zones of brain in ASC. To a certain extent the latter is compared with increasing the coherence of bioelectrical activity which is observed by systematic lessons of meditation. However, it should be stressed that the formation of isogradient has a quite appointed functional significance and it testifies to the fact that the processes of differentiated brain local activation (see Fig. 2, fragment 1) which are typical of D-mode (usual state of consciousness) are changed in ASC by a system which is practically homogenous according to the level of the activation of

Fig. 1 Example of the Brain Electrical Activity Mapping.

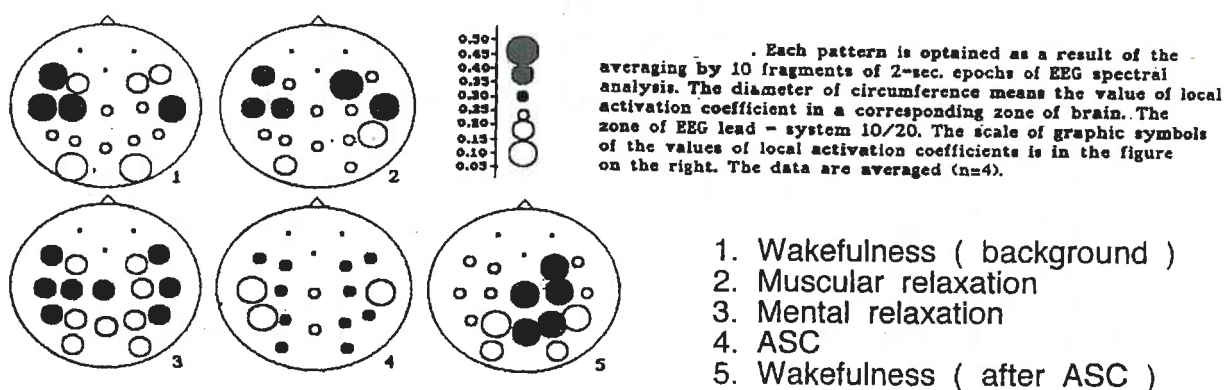
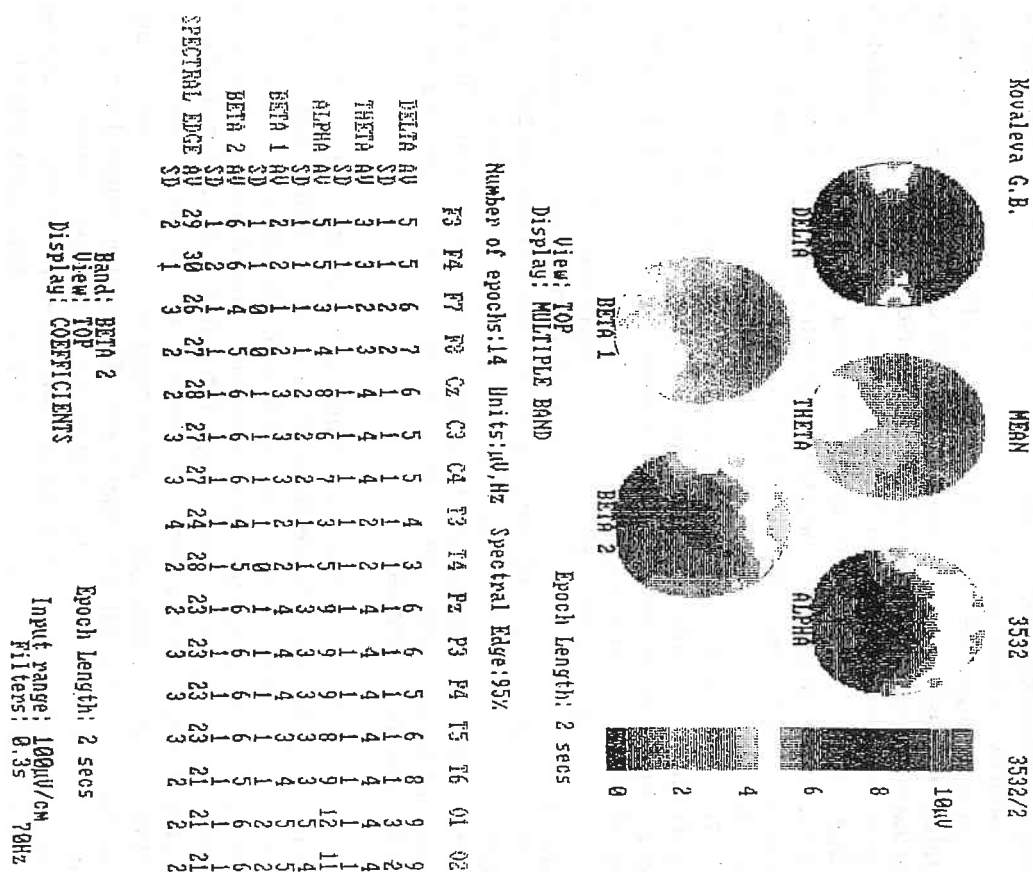
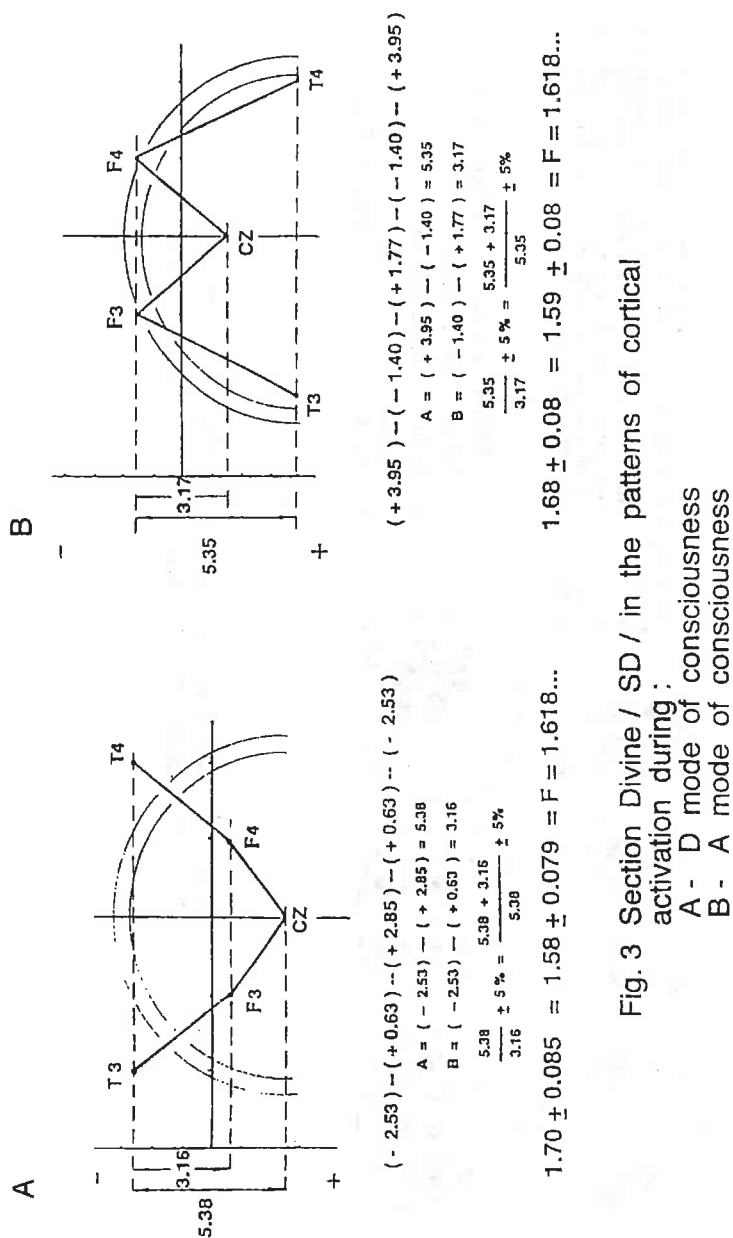


Fig. 2 Averaged patterns of cortical activational structures in the continuum of the states of consciousness.



its links. The smoothing out of brain functional asymmetry is the most significant consequence of this process. Besides that, under these conditions there occurs an essential reconstruction of the interaction of the links of so-called "cognitive axis of brain" which include left frontal and right parietal-temporal spheres of cortex (Sviderskaya N., Korolkova T., 1994). These processes lead to taking away the dominance of left hemisphere frontal zones which carry out the process of successive deliberate revision of information by a simultaneous rise of activation in parietal-temporal-occipital zones of brain, that is in the zones of brain realizing the simultaneous, rapid and non-realized level of the revision of information (Lurija A., 1973; Pavlova L., Romanenko A., 1938).

Hence, we have every reason to affirm that under the conditions of ASL induction and self-induction *there observe the unbreaking of genetically determinate preference of right hemisphere processes of the revision of information.*

The subsequent investigations showed that the systemic organization of CLA* in antecentral regions of left and right hemispheres do not confine themselves to the phenomenon of functional asymmetry smoothing out. The statistical analysis of CLA testifies to the fact that the relationship between the CLA frontal, anterior-parietal and central zones of cortex are not only inverted by the transition from D-mode to ASC, but they also correspond to the universal complex constant - the "golden" ratio (see Fig. 3) (Unestahl L-E., Bundzen P., 1996).

So, the development of ASC is accompanied by two interconnected processes: firstly, by smoothing out the brain functional asymmetry and secondly, by the formation in these conditions of the distributed harmoniously organized activated structure in antecentral sector of brain.

From the biophysical point of view the revealed pattern of CAS in ASC should rightfully be considered as a *dissipative harmonious resonator* which allows us to suppose a high sensitivity of brain under the conditions of ASC to the phenomenon of so-called "information resonance".

The theory of "information resonance" was formulated by I. Shmelev in 1990 in the course of studying the role of "golden" ratio in the processes of resonance isomorphism. The resonance isomorphism represents the method of adequate information intercourse in nature and ecosystem "human being - environment" (Shmelev I., 1990, p. 309).

At present on the whole under the phenomenon "information reso-

* Systemic organization of CLA has formed patterns of cortical activated structure or CAS.

nance" we understand the processes of inductive "replenishment" of harmoniously structural environment (in this case - CAS of brain) at the expense of the signals that have a proportionate harmonious component.

In modern theoretico-methodological literature the given type of interaction in the system "human being - environment" is interpreted from the point of view of the functions of "third signal system" or in a more common plan the system of "ecoceptive sensibility" (Shmelev I., 1990; Samosiuk I. et al., 1994; Faidysh E., 1993).

Hence, in this case the system of two signal systems elaborated in the school of academician I. Pavlov is supplemented with the conception of the third signal system, a particular kind of code at the level of which appears the universal constant - "golden ratio" (or SD code according to the latin name "section divine").

The revealing of the selective sensibility of brain analysing systems to the "golden" ratio appears to be the corroboration of the given conception (Fechner G., 1876; Sander F., 1931; McCulloch W., 1965; Swistun T., 1996 and oth.). The investigation carried out by T. Swistun (1996) on determining the stereognostical preference to symmetrical and "golden" figures is of special interest in this case. On the grounds of the examination of more than 200 subjects the author emphasizes that the investigations carried out prove "the ability of brain parietal lobes not only to differentiate the "golden" ratio, but to design all over again the figures according to the given algorithm" (cit. by A. Subbota, 1996, p. 46). In this case it should be noted that in the indicated investigations there existed the most important task - the aesthetic assessment of geometrical space.

Today there also expressed a supposition that the aestherisism of "golden" ratio for a human being is probably associated with the presence of "the model" of proper body in the central nervous system; this model corresponds to "golden ratio" and Fibonacci numerical series (Subbota A., 1996). It should be supposed that this internorizing model (that's acceptor) "will mark" the aesthetisism of information that enters the brain if some elements of "golden" ratio will be represented in the structure of information signal.

If in this case to take into consideration that the historically formed ecocultural environment of man (architectural, misical and verbal-poeticas space) includes statistical and dynamic structural-rythmic complexes that submit to "golden" ratio, then theoretically the conception of "third signal system" acquires the logical completion (see Marutaev M., 1990; Turner F., Poppel E., 1995 and oth.).

All above-stated in comparison with the results of the investigation of the regularities of changing the CAS structural-systemic organization the conditions of mental relaxation (see above) enables us to express the following supposition.

Firstly, if to take into account the fact that in ASC in higher section of brain there forms an activated structure which represents the dissipative harmonious resonator, then the neuro-dynamic markers of ASC and correspondingly the psychological effect of mental relaxation may probably be intensified at the expense of including harmonious components proportionate to "golden" ratio in signal influences.

Secondly, we have every reason to think that facilitating the processes of isomorpho-harmonious resonance in the system "brain-environment" the systematic mental training can probably exerts a modulating influence on the processes of psycho-sensor synthesis if they are associated with the emotional-esthetic assessment.

So, as a whole, one can suppose that the purposeful participation of neuro-biophysical mechanisms of brain "third signal system" in the process of mental relaxation gives an opportunity to intensify the influence of mental training on the formation of deep elements of emotional-aesthetic state and perception of the world (conciliation, beauty, sense of harmony with the whole world).

The experimental test of stated suppositions formed the task of complex investigations carried out in the years 1995-97 (Bundzen P. et al., 199, Zagrantsev V., Kozlov V., 1996; Gavrrilova E., Isakov V., 1996; Bundzen P., Uneståhl L-E., 1997).

THE METHODS OF INVESTIGATIONS INCLUDED:

1. Recording of omega-potential (quasi-constant potential of millivol-range) (see Iliukina V. et al., 1982) by the bilateral lead of lob-tenor. In the investigations there used non-polarized chlorine-silver electrodes of the firm "Nikommed" (Denmark) (patent N 2013775, Russia, 1994).

2. Recording of electroencephalogram from 16 zones of brain by the system 10/20 with the subsequent spectral analysis and statistic analysis of local activation coefficients: $K1 = \theta/\alpha$ and $K2 = \beta_1/\alpha$.

3. Measuring of xy-potential (patent N 2087125, Russia, 1997) and the construction of graphs Riodoraku by the Nakatani method by means of determining the electric conduction of 12 power canals representative points (accupuncture meridians).

4. The energy emission analysis or gas category visualizatoin* (Kirlian S. and Kirlian V., 1964; Mandel P., 1986; Korotkov K., 1995, 1996 and oth.) for the purpose of the assessment of organism functional power state by means of studying the intensity and distribution of gas category phosphorescence through energetic canals.

5. Synthesis of graphic images - computer drawing of geometrical figures (the programme GOD). The essence of the given method consisted in an active transformation of a square and a circle correspondingly into a rectangle and an oval by the subjects, as well as the selection of those figures that subjectively have the most preferable proportions.

6. Analysis of psycho-emotional state of subjects by means of the test POMSC state of health, mood, activity) and the assessment of personal prosperity by means of the test "Well".

The psychological investigations were carried out before the beginning of the course of mental training and after its completion.

The course of mental training took eight weeks and included the special program "ID" (inner development); its structure is presented in Table 2).

As Table 2 shows the program "ID" consists of 4 fragments, two of them being relaxative and classical music. As a classical music there used some fragments of the recording "Avslappningsmusik för kropp och själ" (Lars-Eric Uneståhl) including the flicker noise thundering of the brakera as one of the components. Some sound combinations of mantres (mantres - sound rhythmical formulas; their listening and pronouncing allow to change the functional activity of organism power centres and their influence on subjects' psycho-emotional background and emotional state), were put on musical line of these recordings in addition. The order of the presentation of mantres took into consideration some recommendations of E. Faidysh (1993). The selection of classical music whose fragments were used in the investigations were determined by the results of the researches of M. Marutaev (1990,) and S. Shushardzhan (1994). As a base fragment for the program "ID" there selected the second part of Chopin's concerto for piano and orchestra, which is typical of minor music with slow tempo and the ratio of metrioscales of musical form basic sections which correspond

* In the used method of biopowerdiagnostics the phosphorescence of gas category appears near the surface of the investigated object place in an electric field of high intensity (the Kirlian effect).

Table 2

STRUCTURE OF THE COURSE MENTAL TRAINING -- " INNER BEAUTY "

WEEK 1	MUSCULAR RELAXATION
WEEK 2	MENTAL RELAXATION
WEEK 3	INNER CALM
WEEK 4	SELFCONFIDENCE AND SELFESTEEM
WEEK 5	MENTAL ENERGY
WEEK 6	CHEERFULNESS / OPTIMISM /
WEEK 7	INNER DEVELOPMENT
WEEK 8	SD - CLASSICAL MUSIC AND " ID "

STRUCTURE OF AUDIO-PROGRAMME " INNER DEVELOPMENT "

Induction of the Alternative State of Consciousness....	9 min
Avslappningsmusik with mantra sounds combination / åm, ham, jam, ram, vam, lam, im /.....	6 min
Classical music - Concerto for piano and orchestra N 1 in E-minor, Op 2, Romanze / F. CHOPIN / with musical structure Section Divine.....	8 min
Going out from state of Mental Relaxation.....	2 min
Music for soft harmonization with environment -G.E.N.E. " Mediterranean mood - Mallorca love theme.....	3 min
	28 min

to "golden" ratio (SD-code). In the subsequent statement the complex of the programs including the experimental program "ID" (see above) is considered as an integral mental training (IMT).

The subjects were students and post-graduated students at ages 17—20—28 in number. All the subjects were right-handed; they did not have pronounced signs of any lesions of neuro-psychical status. The subjects were divided at random into two groups; an experimental group and a control one ($n = 14$); there made up separate programs of mental training for them. Two last weeks had some differences in the programs. On the seventh week the control group used the program "IDCo" where the musical fragments 2 and 3 (see Table 2) were substituted for a rhythmic music of D. Last orchestra. On the eighth week the subjects of control group used the program "IDC" in combination with instrumental music selected by their own desire.

BASIC RESULTS OF EXPERIMENTAL INVESTIGATIONS:

1. Some peculiarities of activated processes lateralization in the conditions of using the programs "ID" and "IDCo".

In the course of the investigations there found out that under the additions when the musical fragments of "ID" program contain so-called ficer-al sound (thundering of the breakers) and SD-code, that's harmonious components of "golden" ratio, there observe a statistically reliable smoothing out of omega-potential bilateral asymmetry (See Fig. 4). As the drawing shows in the first period - the ASC induction period (heteroverbal influence) there occurs a conjugate reduction of omega-potential level by the reliable preservation of a higher level of omega-potential in the left-side lead. In the period of the presentation of relaxing music together with sound formulas of mantres and the flicker noise (Voss R., 1989) the bilateral asymmetry of omega-potential disappears, and its values are over so-called "optimal" range 20 ± 5 mV. As it was shown earlier this range is typical of the state of mental relaxation and the formation of ASC.

In contrast to it in the period of the sounding of classical music containing some elements of SD-code the level of omega-potential reveals the tendency to the rise, but it does not overstep the upper limits of the range 20 ± 5 mV. In this case as in the previous fragment of the program one cannot find out any bilateral differences in the level of omega-potential. The statistical analysis certifies that in this case the smoothing out of omega-potential bilateral asymmetry occurs at the expense of the rise of its values in the right-side lead.

In the control group the substitution of musical fragments for instrumental music provoked a rather fast rise and the outlet of omega-potential from the range 20 ± 5 mV, as well as the restoration of bilateral asymmetry. It is significant that in the case the restoration of bilateral asymmetry mainly occurred owing to increasing its values in the left-side lead.

Hence, it is quite obvious that the program "ID" and "IDCo" exert non-unambiguous effect on the organism biopower state. So, if the program "ID" leads to the preservation of ASC at a high power level at the expense of musical fragments used in it, the program "IDCo" quickly takes the subject out of ASC.

2. Particularities of changing spectral characteristics of EEG and the patterns of brain hemispheres local activation under the condition of using the program "ID".

The aims and objectives of this series of investigations carried out on the subjects of experimental group (14 persons) consisted in studying some peculiarities of changing ASC neuro-dynamic markers revealed earlier by the presentation of musical fragments 2 ID and 3 ID (see above) in the course of mental relaxation.

The results of EEG spectral analysis testify that there exist fundamental differences in neuro-dynamics by the presentation of fragments 2ID and 3ID. In the phase of 2 ID presentation there observe a statistical reliable intensification of theta-activity and the reduction of alpha-activity (see Figures 5-3) which appears to be the reason of the growth of index K1. Unlike this in the phase of 3 ID presentation there occurs some reduction of theta-activity by simultaneous increase of the level of alpha-1 and beta-1 activity (see figures 5-4) which reliably raises the values of K2.

So, on the whole the changes of spectral characteristics confirm the data obtained by the recording of omega-potential in the subjects of experimental group if to take into account the connection of omega-potential with the level of activated processes (Iliushina V., Zabolotskih N., 1993).

If to look through the topographic distribution of the values K1 and K2 by brain zones (averaging data of 10 epoches by the duration of epoch - 16 s, then it becomes obvious that in the phase of the presentation of musical fragment 2 ID the processes of systemic-structural harmonization along K1 seize namely "the cognitive axis of brain". Unlike this in the phase of musical fragment 3ID presentation the processes of systemic-structural harmonization are determined by both activated coefficients (see Fig. 6) and practically seize all analysing zones of right-and-left hemispheres.

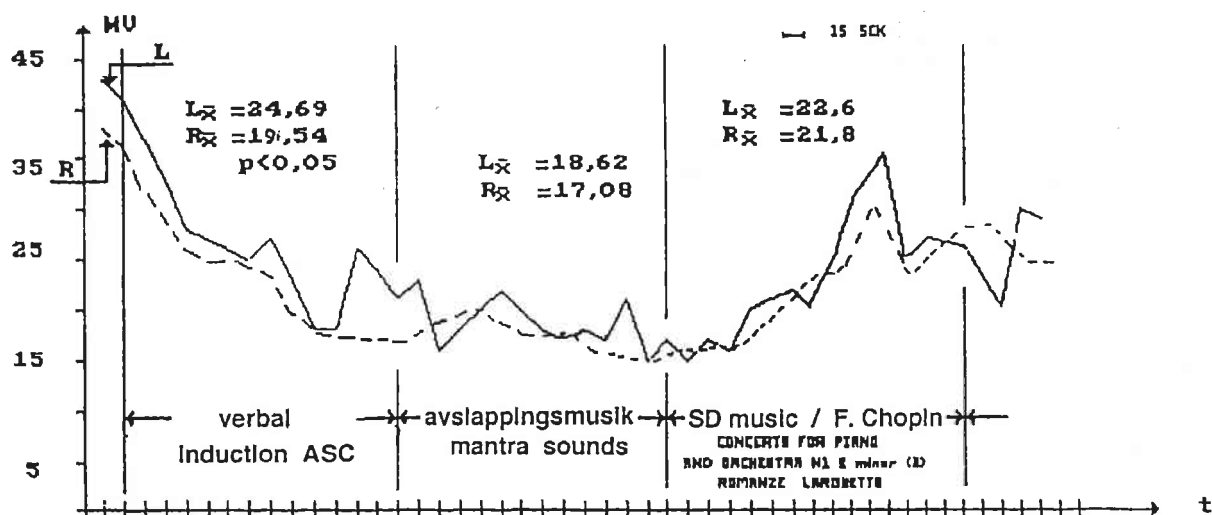


Fig. 4 The dynamics of the OMEGA potential during of mental relaxation with using of audio-visual SD stimulation / "ID" programme /

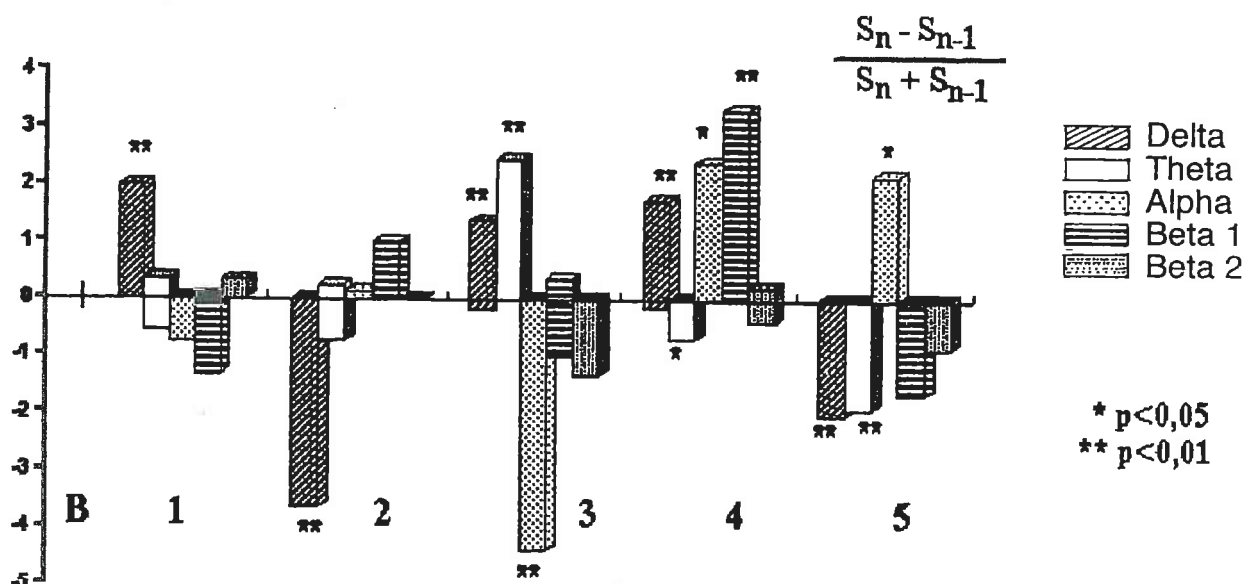


Fig. 5 Relative changing of the spectral characteristics of EEG during induction of ASC / "ID" programme /

B. 10 min. before ; 1 and 2 verbal induction ASC ; 3. avslappingsmusik with mantra sounds combination
4. SD music / F. Chopin / ; 5. 10 min. after

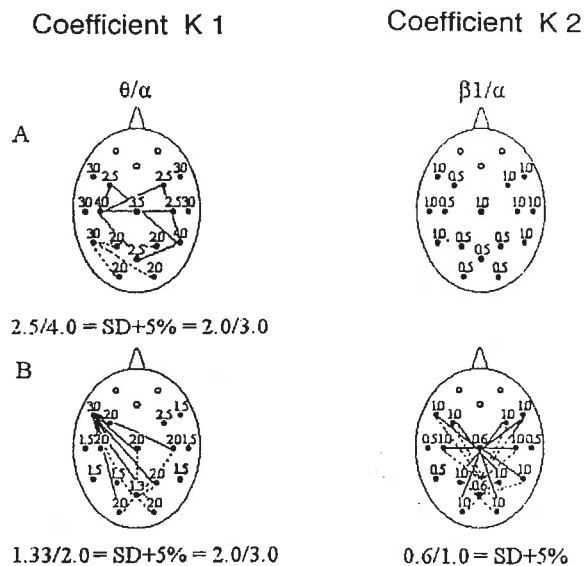


Fig. 6

Distribution of the EEG SD - patterns on the different stages mental relaxation during presentation of the "ID" programme

- A Avslappningsmusik with mantra sounds combination
B SD music / F. Chopin / Piano Concerto No 1 in E minor

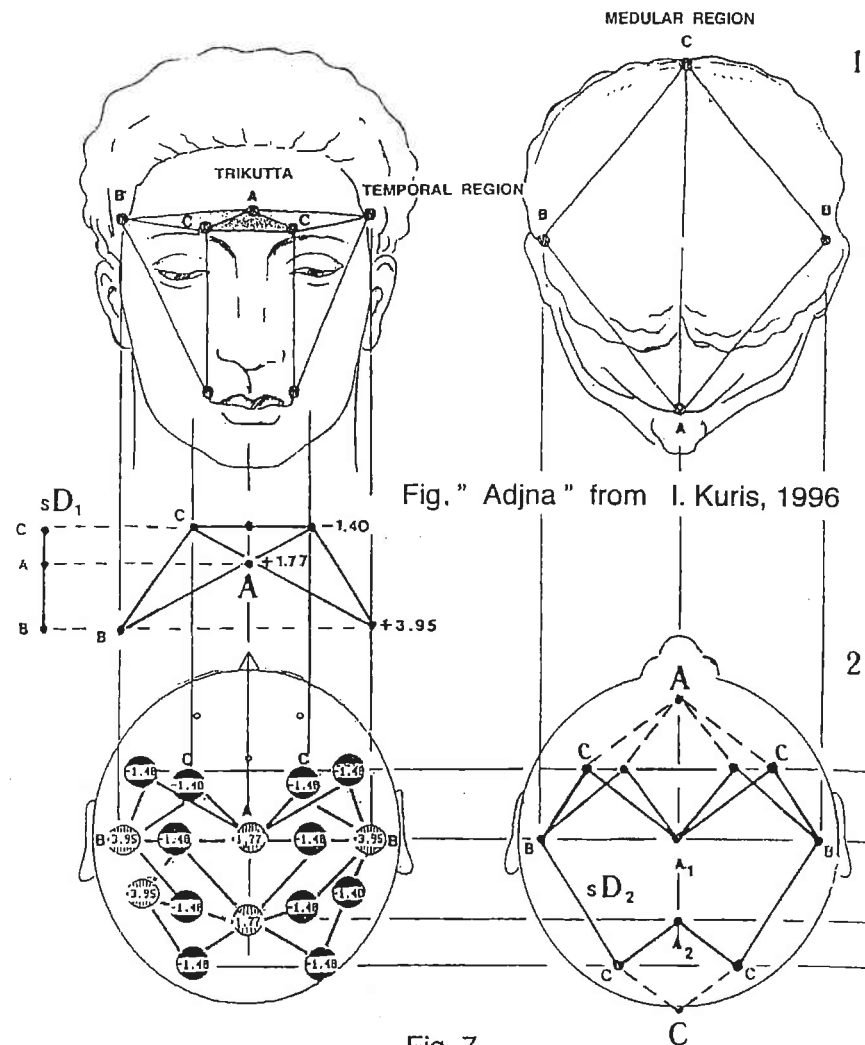


Fig. 7

Comparison of the profile of activation pattern in ASC, which is submitted low-governed nature SD, with position of the power centers in system "ADJNA"

Hence, the processes of structural-systemic harmonization at the level of CAS sharply intensify at the moment of acoustic perception of minor slow music containing in its structure the "golden" ratio. In this case it is very important that it occurs by keeping a relatively high level of cortex activation and smoothing out the functional asymmetry, that's the preservation of ASC neuro-dynamic markers.

The connection of the processes of the harmonization of brain hemispheres functional activity with the formation of ASC was earlier discussed by us more than once. It should be noted only that in non-traditional medical and the psycho-diagnostics of oriental countries the phenomenon of "functional equilibrium of hemispheres" is associated with the opening and balancing of higher power centres that are reached in the process of prolong systematic meditation.

Indeed, if to compare the zones of brain cortex between which in ASC there reveal the processes of systemic harmonization and the projection of the centres that belong to "Adjne" (the third eye) (see Fig. 7), we will see their coincidence. However, of course this coincidence cannot be an argument. Unfortunately, we could not practically find reliable objective methods of studying the functional state of power centres.

Therefore at the given stage of investigations for checking the supposition about the change of the activity of the links of organism biopower systems in the conditions of mental training we used some methods of biopower diagnostics which obtained the most profound theoretical basis and experimental approbation. These are: the study of power canals functional state and power emission analysis.

3. The study of some alterations of the functional state of the sections of organism biopower system in the conditions of using the programme "ID".

As described above in the given series of investigations there used two methods which showed themselves to advantage in Russia and in the world as accupuncture diagnostic methods: this is the system "Zodiak" (Zagrantssev V., Kozlov V., 1996), the Nakatani method (Samjsiuk I. et al., 1994 and oth.) as well as the method of gaz emission visualization (the Kirlian effect) (see Korotkov R., 1995).

The measurements of Xy-potentials and electrical conduction were made at 24 representative biologically active points (BAP) that correspond to 12 basic meridians. On the basis of the measurements by means of the computerized systems "Zoliac" and "Ryodoraku" (the production "Ekectronic medical system") there determined the general functional index,

the BAP bilateral balance and the balance of inj- and jan systems.

For the method of gas emission visualization there used the generator "Grown" and the photometrical system with the digital TV-recording in a real time of the results of measurements. There took the gas emission characteristics of fingers, of left and right hand by the exposition of 0.5 sec. and the electric field of 15 kV.

The measurements were made prior to the seance of mental relaxation and in the post-relaxing period, 10 ± 3 min after the subjects' going out of ASC.

In the process of the analysis of experimental material there found out the following regularities.

First of all, by means of the measurement of Xy-potential and the plotting of Riodoraku-maps there proved that the mental relaxation led to the rise of BAP power potential and the equalization of Xy-potential values in symmetrical right-and left-side canals (Bunszen P. et al., 1996) (see Figure 8).

The investigations carried out by the Nakatani method not only corroborated these data, but they also allowed to prove that the introduction of musical fragments 2ID and 3ID into the programme "ID" enables us to re-establish the "power balance" between the systems "inj" and "jan" (see Fig. 9).

In its turn the method of emission analysis (the gas emission visualization) also confirms the fact that in the course of mental relaxation the formation of alternative state of consciousness is accompanied by some essential changes of biopower processes. In particular, in the course of the inestigations there revealed not only the rise of phosphorescence intensity of all tested fingers of the hand, but also a selecting amplification of the phosphorescence of ring-finger contact zone (see Fig. 10).

If to take into consideration the data of the topography of power emission processes (Mandel P., 1986), there appear every reason to suppose that most probably *the mental biopower* exerts a direct influence both upon the functional state of power canals and upon power centres (jakr) of human organism.

It is beyond all question that the revealed effect requires the most thorough experimental study, and first of all from the point of view of a more precise definition of the topography of phosphorescence pattern. However, today it is evident that the systematic mental training changes *the organism systemic biopower homeostasis*. In this case when taking account the psychophysiological symptoms of the balance of power cen-

tres known at present (jakr) (Faidysh E., 1993) and the connection between the systems of power canals "inj" and "jan" and correspondingly between ergo- and trophotropic neurohumoral systems of organism (Gavaa Luvsan, 1986 and oth.), as well as between peptide-ergic systems we have every reason to suppose that the revealed changes of the links of biopower system play an essential role at the reconstruction of general psycho-emotional background by mental relaxation.

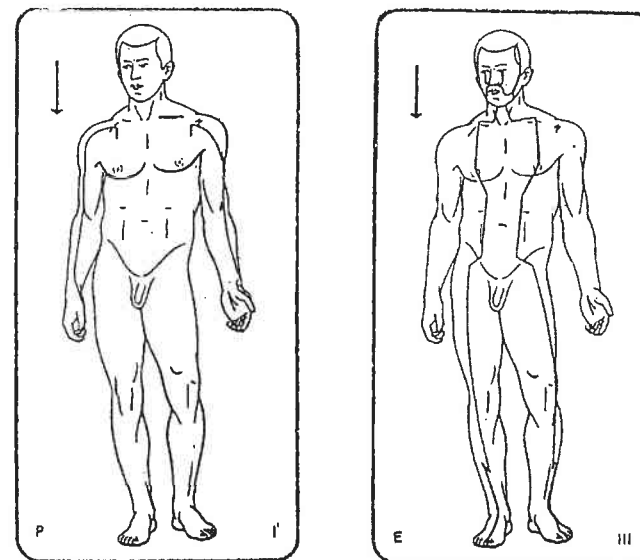
Indeed, the results of testing by means of the method "POMS" (see Fig. 11) and the self-accounts of subjects testify to the formation of an active specific mental state as a "calogenesis". * One of the signs of this state which is typical of the post-relaxing period that follows the listening to the programme "ID" is the phenomenon of "the expansion of psychical space". Today it is rather difficult to describe the psycho-physical nature of the given phenomenon. The changes of the system BAP sensitivity in ASC which are as it is supposed polymodal ecoreceptors that are susceptible to external electromagnetic fields could be one of possible explanations (Samosiuk I. et al., 1994 and oth). A number of authors think that this is there processes based upon some phenomena of frequent resonance that are the basis of a human contact in ASC with the so-called thin material world (Faibysh E., 1993; Kastrubin E., 1995; Kiuris I., 1996; Korotkov K., 1996 and oth).

If to return to concrete experimental facts, then it should be stressed that the formation of "calogenic" physical state by using the "ID" program depends to considerable extent on including sound combinations of mantras directed to the system of power centres into a fragment of relaxation music. The psycho-physiological and neuro-biophysical mechanisms that form the sounds of this effect undoubtedly demand subsequent through study.

In this case it is necessary to take into consideration the literary information on psychical symptoms of balance and the imbalance of organism power centres (E. Faidysh., 1993).

All above stated enables us to conclude that the integration of "ID" program into the system of mental training essentially extends the spectrum of bio-energoinformative influence on the functional state of brain and organism as a whole and forms a specifically psychotropic effect.

* "Caloginesis" - from the Greek word "calos" (beautiful, elegant) and "genesis" (result). The term was introduced into neurobiological literature by F. Terner (1995); it is used as a symbol of a special type of emotional-aesthetic experience.



Acupuncture. Meridians

P - 1-pulmonary meridians, E - 3 - gastric meridians

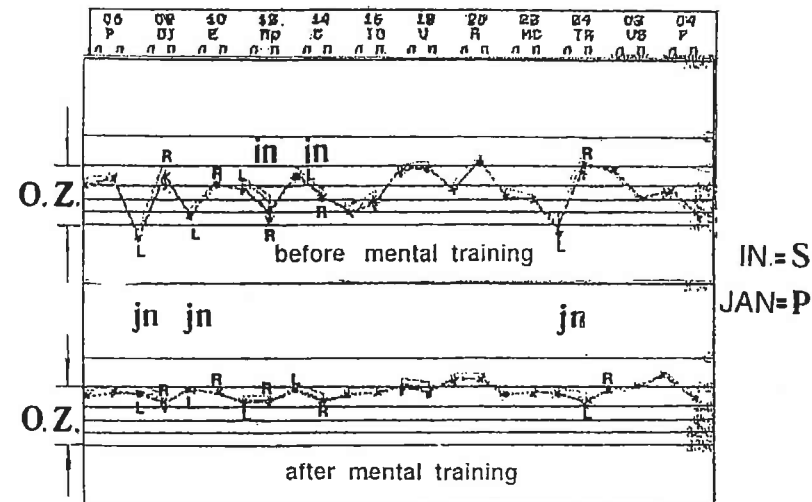


Fig. 8 Effect of Mental Training on the energy of acupuncture meridians

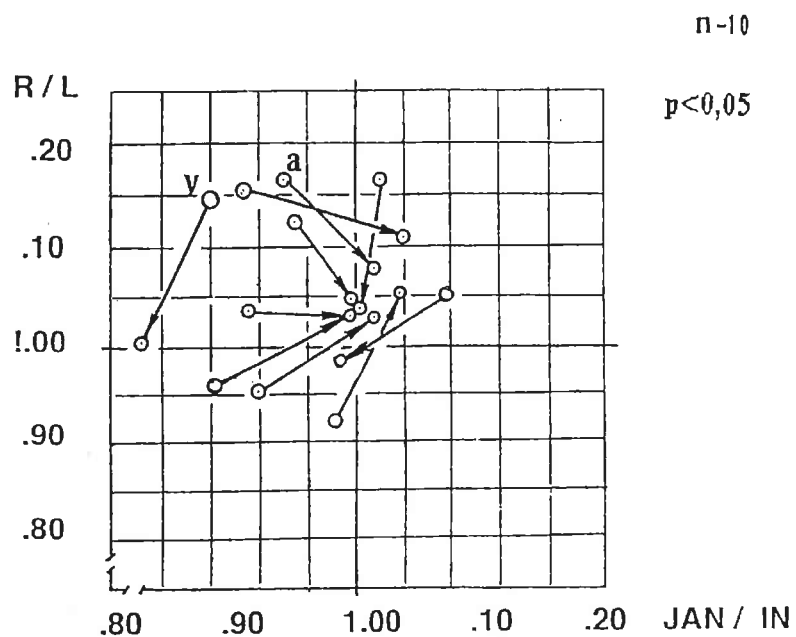


Fig. 9

ALTERATION OF THE INDEX BILATERAL
FUNCTIONAL ASYMMETRY RIODORAKU AND INDEX
OF THE JAN/ IN UNDER INFLUENCE MENTAL
RELAXATION WITH "ID" PROGRAMME

Nacatani, 200 mKA 12 V

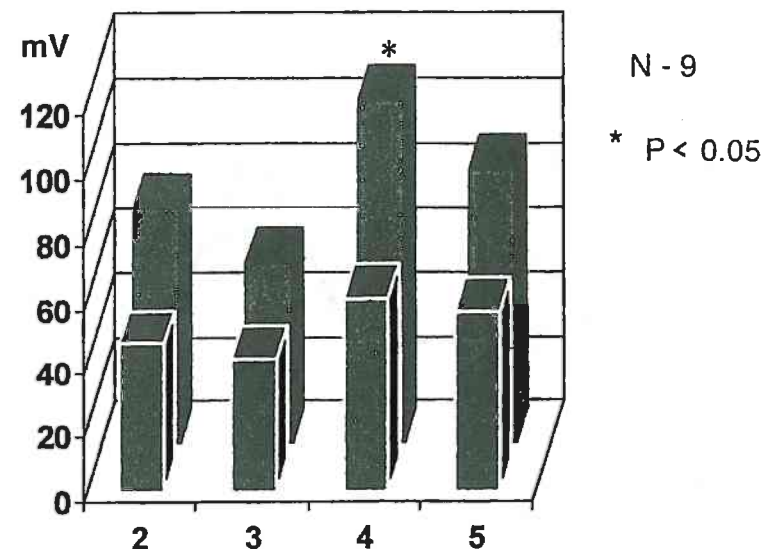


Fig. 10

Kirlian aura changes / Energy Emission Analysis /
during self-induction of the Alternative State of
consciousness .

2,3,4,5 - fingers of the left hand

Front line - D-mode of consciousness / before mental relax-
ation /; back line A-mode / alternative state of consciousness/.

In upper part - Energy Emission Patterns of the fourth
left / nameless / finger. 1- in D-mode and 2- in A-mode
of consciousness.

TEST POMS

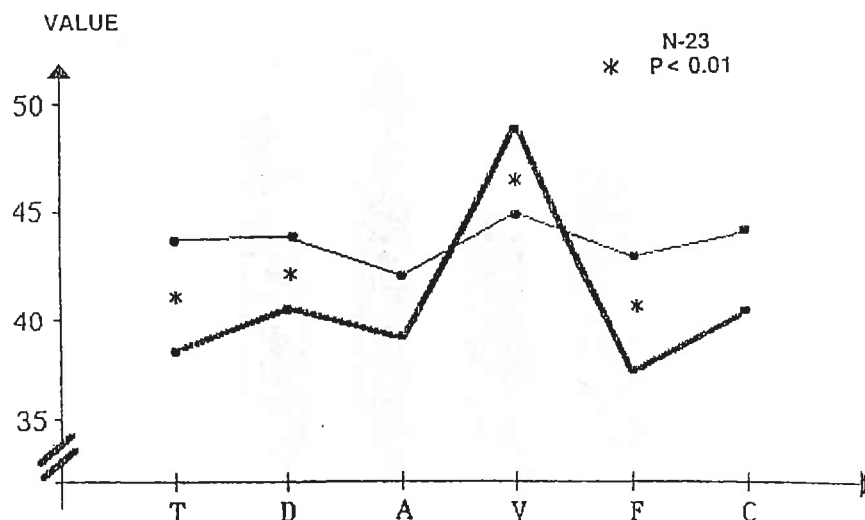


Fig. 11

ALTERATION OF PSYCHO-EMOTIONAL STATUS IN A 21 WEEKS OF MENTAL TRAINING

T- TENSION - ANXIETY; D- DEPRESSION-DEJECTION

A- ANGER-HOSTILITY; V- VIGOR; F- FATIGUE; C- CONFUSION

— — — — — - BEFORE MENTAL TRAINING
 — — — — — - AFTER MENTAL TRAINING

4. Peculiarities of integrated mental training psychotropic effect that is included into "ID" program.

As was shown above, the integration of "ID" program into the system of mental training essentially modulates the psychological effect and facilitates the formation of "calogenic psychical state". The majority of the subjects estimate this state as a state of "spiritual peace and inner keeping awake, joy and sense of inner harmony". It draws together the effect of "ID" program, in particular with a psychological effect after studying the transcendental meditation for many years (Gotvald F. and Knovalt V., 1993; Aorf S., 1992).

Today the psychotropic effect which is typical of trance states is more often considered proceeding from the conception of "forcing forms of behaviour" (driving behaviour) (Turner P., Peppel E., 1995); it is notable for the variety of forms. In the construction of "ID" program two basic factors that's the code SD and mantré sounds combinations have this loading (see above). According to the findings their influence is incompetent to reduce only to the formation of positive emotional background.

If to judge by the self-accounts of subjects, the calogeneity of psychical state as one of the forms of "driving behaviour" - this is a form of consciousness accentuating the emotional-contemplative component of consciousness which defines the opening of personality, as well as his/her value orientation in the world and personal prosperity.

The analytic study of transformations that form the consciousness is complicated first of all by the lack of adequate methodical approaches.

Taking into consideration all above-stated in our investigations we showed some preference first of all to the test elaborated by National Wellness Institute, Inc. Stevens Point, USA - test "Well".

The choice of the given test was defined by two circumstances: first by its direction of attention towards the complex estimation of psycho-physical prosperity of personality and secondly, by a special accent on the determination of the emotional-spiritual component of prosperity whose transformation is obvious under the conditions of systematic mental training.

The test "Well" has six scales that test the following; a physical, emotional, social, ecological, intellectual and spiritual prosperity of personality. In our investigations the test "Well" was presented twice: at the beginning of 8-week course of mental training and immediately after its termination. In experimental and control groups the conditions of carrying out the test were identical. As Fig. 12 shows the statistically reliable change of

two components: emotional and spiritual prosperity is typical of the subjects of experimental group only.

If in this case we appeal to the definition of spiritual prosperity, (definition of spiritual prosperity by the test "Well". The spiritual dimension involves seeking the meaning and purpose of human existence. It includes the development of a deep appreciation for the depth and expanse of life and respect for the natural forces that exist in the universe), that the test "Well" operates and analyses the questions and answers which changed as much as possible after the source of integrated mental training then we will see that the mental training including the program "ID" mainly changes the stability of emotional state, the orientation of personality for the reach of global values of existence and an interest of personality for the arts.

In spite of an obviously positive character of the investigations carried out with using the test "Well" the question of adequate methodical fitting out of this section of work remains open, as some well-known psychological methods are mainly directed towards the analysis of religious spiritual life (Kass J. et al., 1991; Hawks S. et al., 1995).

The second test which was used in the given section of work is the computerized test "GOD" aimed at the study of some peculiarities of two-sided graphic pictures psycho-motor synthesis by a subject.

The idea of the test "GOD" elaboration and use is associated with the fact that for intensifying the processes of harmonization in higher sections of brain the program "ID" uses the code "SD" ("golden ratio").

The test "GOD" enables us practically to evaluate by a subject the preference of the form of geometrical figures which are actively synthesized by him. As a criterion of aestheticism (concealed from the subject) there use the measure of approach of selected form to the standard of "golden ratio".

The results of experimental group investigations statistical processing are presented at Fig. 13. As the findings show the inclusion of the programme "ID" into the process of mental training leads to the approximation of the results of oval and rectangle synthesis to the standard which is determined by "golden ratio". In the control group this effect was not revealed.

From our point of view the revealed modulated influence of "ID" programme on the aesthetics of thoughts constructions is of principle significance as the aesthetic ideal of personality is known to define the understanding of the beautiful in life and art and the aspiration of man for living by the laws of beauty and justice.

TEST WELL

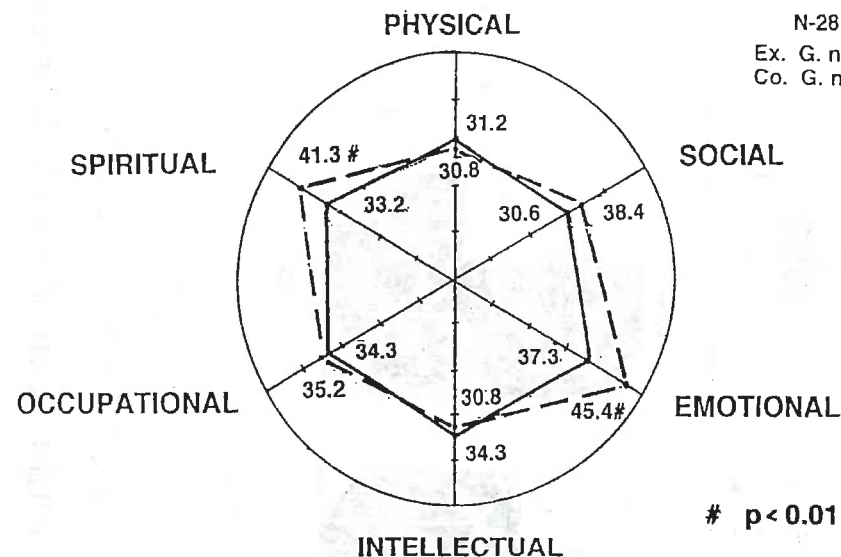


Fig. 12

COMPARATIVE DATA BEFORE AND AFTER
SYSTEMATIC MENTAL TRAINING WITH PROGRAMME
"INNER DEVELOPMENT"

— before mental training
- - - after mental training

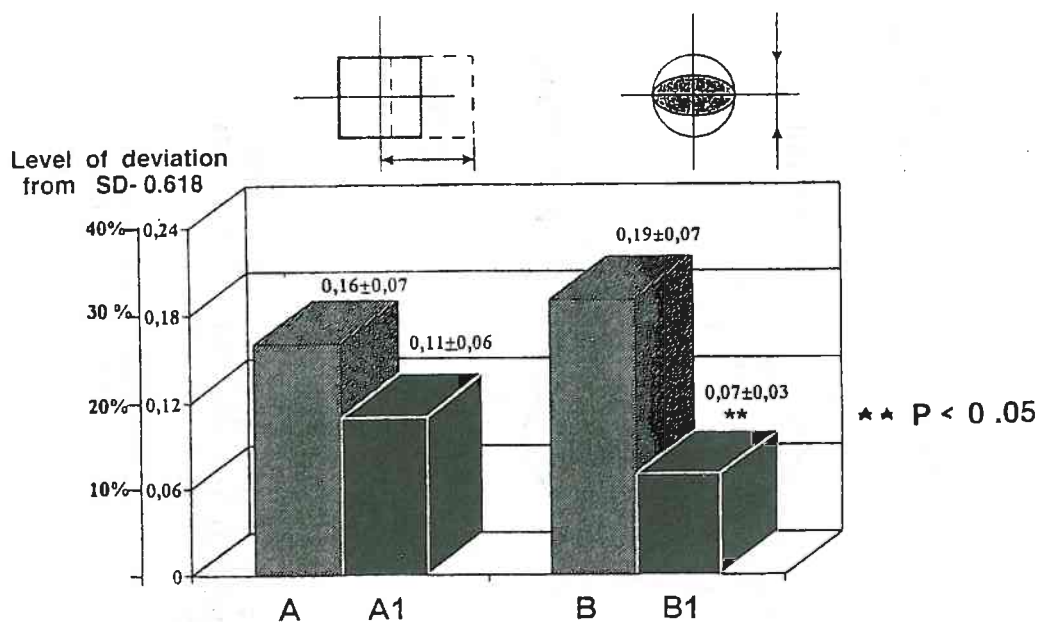


Fig.13

Outcome of the compositional drawing (computer programme "GOD") before - A, B and after - A1, B1 mental training with SD music

Model of the Psycho-Physical Effects of Integrated Mental Training

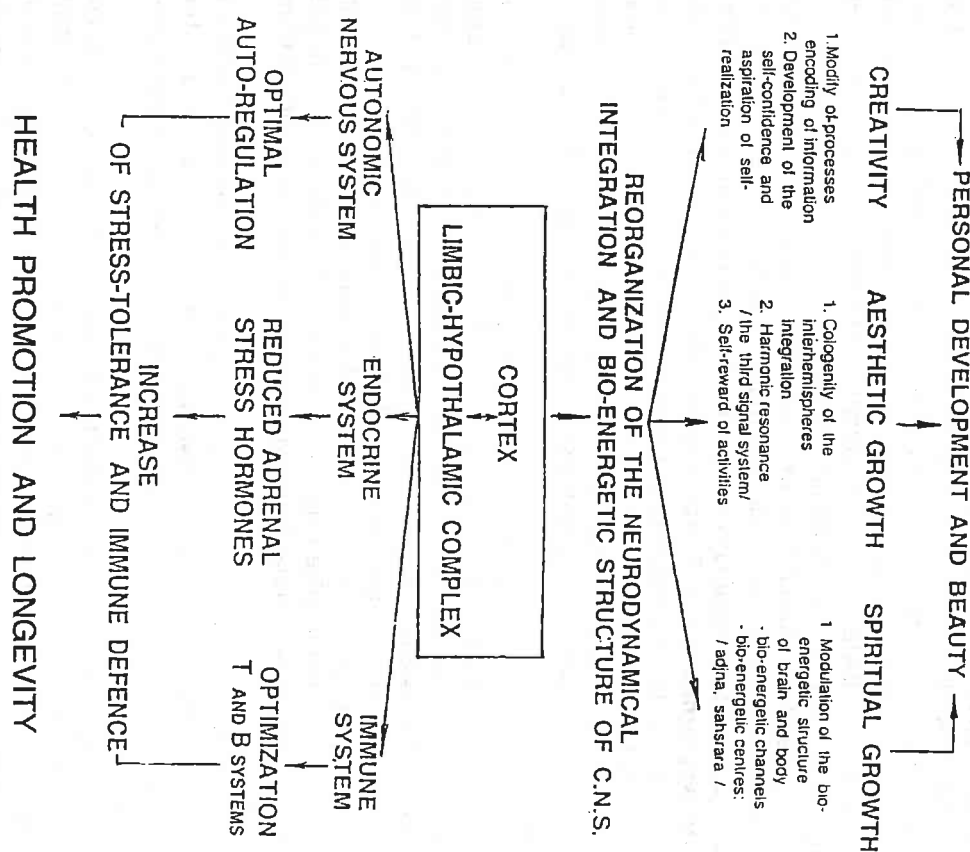


Fig. 14

CONCLUSION

The results of the investigations carried out testify that the **systemic-structural harmonization of biopower informative processes** is the basic psycho-physiological mechanism of mental relaxation. In consequence of it there occurs the formation of a highly specific functional state which could be characterized as a **harmoniously activated brain**. The findings also give every reason to affirm that in these conditions at the level of higher sections of brain the phenomena of isomorphic-harmonious resonance are relieved. At the same time judging by the results of investigations there occur some alterations of functional state and power equilibrium at the level of the links of organism biopower system.

In spite of essential differences in biophysical mechanisms, from out point of view the indicated processes have the common functional trend - **the expansion of brain receptive functions and the system of eco-ceptive perceptibility**. The connection of brain receptive functions and, in particular the processes of brain intrareception with the state of consciousness may consider practically to be established (Kupalov P., 1963; Bundzen P., 1982; Seregin V., 1994). The fact that the brain receptive functions or processes "inner vision" essentially alter in ASC is of great importance.

Conditionally it is rightful to identify the given phenomenon with the deinhibition of the "third signal system" activity meaning in this case both the changes of the perception threshold of subconscious sphere faint signals and faint ecosignals. The obtained experimental data clearly show that the direct consequence of indicated reconstruction is:

- firstly, some changes of the correlation between the discursive and emotional-contemplative sides of consciousness which as generally is known are in close connection with the realization of personality spiritual potential.

- secondly, the formation of highly specific "calogenic state" which is characterized not only by a positive psycho-emotional background, but also by the harmonization of inner world, and broadening of field of consciousness.

The fact that under these conditions there occurs the modulation of the processes of personality aesthetic preference to the side of beauty criteria common to all mankind, as well as the rise of emotional and spiritual prosperity self-appraisal gives every reason for integrating the approved methods of biopowerinformative influence into the structure of mental training programs.

In conclusion we would like to underline that the authors do not consider at all that all the aspects of presented investigations (see Fig. 14) are notable for the identical degree of experimental studying and completion, a number of them undoubtedly demand a subsequent purposeful study. However, from our point of view at the given stage of work it is already clear that the integration of mental training with the fruit and value of human culture gives a real opportunity to enreach its influence not only to health promotion and rejuvenation but also on the field of human spiritual life.

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REFERENCES

1. *Lebedeva N., Dobronravova N.* "Organization of human being EEG rhythms by special states of consciousness". J. of higher nervous activity' 1990, V. 40. P. 951—962.
2. *Sabourin M., Cutcomb S., Drawford G., Pribram K.* "EEG Correlates of Hypnotic Susceptibility and Hypnotic Trance". Intern. J. of Psychophysiology, 1990, 10, P. 125—142.
3. *Walter H., Podreka I., Hajji M., Musalek M., Passweg V., Suess E., Steiner M., Leseh O., Brain* Blood flow differences between hypnosis and waking state. In: "Hypnosis and suggestion: Cognitive and psycho-physiological aspects". Edizioni Scientifiche Italiane, 1994, 12, p. 41—50.
4. *Gruzelier J.* "Towards a neurophysiological basis of Hypnosis". The 7th European Congress of Hypnosis, Budapest, August 17—23, 1996, p. 60.
5. *Molnak M., Csepe V., Banyai E.* Dimensional complexity of the EEG in hypnosis. The 7th European Congress of Hypnosis, Budapest, August 17—23, 1996, p. 106.
6. *Murphy M.* The future of the body: Exploration into the further evolution of human nature. Los Angeles, T. P. Tarcher, 1992.
7. *Spivak D.* "Altered states of mass consciousness". Garst-Kursiv, 1966, p. 127
8. *Astin J., "Stress Reduction through Mindfulness Meditation".* Psychotherapy and Psychosomatics. 1997, 66, p. 97—106.
9. *Brekhman I., "Valeology".* S. - Petersburg, Science, 1995.
10. *Petlenko V.* Actual problems of valeology. Bulletin of Baltic Academy, 1996, 9, p. 7—14.
11. *Ageevets V.* Physical education in Russia. S. Petersburg, 1996, p. 31
12. *Bundzen P.* Physical activity and Mental Health. In: "The Modern Olympic Sport". Intern. Scientific Congress, Ukraine, Kiev, 1997, p. 43—44.
13. *Uneståhl, L-E* Integrated Mental Training. Stockholm/Örebro, VEJE int. 1996, p. 236.
14. *Bundzen P., Bendjukov M., Kiriushin A.* System of psychotraining and psycho-prophylaxis. "Mental training". Bulletin of Russia sport medicine, 1994, NI-2, p. 28—35
15. *Uneståhl, L-E., Bundzen P.* Mental training for sport and life in Russia, S. -Petersburg - Örebro 1994, p. 31
16. *Balandin V.* The efficiency of mental training Swedish model. In: "Physical Culture, Sports and the Nation's Health. Intern. Scient. Congress, Saint-Petersburg, Russia, 1996, p. 261.
17. *Bundzen P.* Healing effect of inner mental training. In: "Eurohypnosis '96". The 7th European Congress of Hypnosis, Budapest, Hungary. 1996. p. 23
18. *Kostyreva T., Kozhevnikov V.* Psychoimmunomodulation under the condition of mental training in athletes. In: "Physical Culture, Sports and the Nation's Health". Intern. Scien. Congress, S. - Petersburg, Russia, 1996, p. 166.
19. *Uneståhl, L-E, Bundzen P.* Integrated Mental Training - Neuro-biochemical Mechanisms and Psycho-Physical Consequences. Hypnos, 1966, 23, N3, p. 148—156
20. *Bundzen P., Gavrilova E., Isakov M., Uneståhl L-E.* Stress-limiting effect of mental training. Bulletin of Russia sports medicine, M., 1996, NI-2, p. 18—23.
21. *Vainik G.* The effect of Mental Training on the Psycho-Emotional Status and the Level of Fitness in Women Participating in Shaping. In: "Mental Training for Sport and Life in Russia", 1994, p. 25—27.
22. *Gavrilova E., Isakov V.,* Stress-limiting effect of mental training. In: "Physical Culture, Sports and the Nation's Health", Intern. Scient. Congress. S. - Petersburg, Russia, 1996, p. 165.
23. *Bundzen P., Uneståhl L-E.* Thinking with Images in the Alternative State of Consciousness - Neurodynamic markers. In: Intern. Symposium for the Physiological and Biomechanical Basis of Brain Activity, S. - Petersburg, Russia, 1994, p. 15.
24. *Bundzen P., Leisner P., Malinin A., Uneståhl L-E.,* Mental Relaxation - Neuro-Dynamic markers and Psycho-physiological mechanisms. In: "Current Research in Sport Sciences". An Intern. Perspective, New York and London, 1996, p. 91—100.
25. *Svederskaya N., Korolkova T.* Genetic features of spatial organization of electrical activity of the cerebral cortex. J. of higher nervous activity, 1994, v. 44, p. 428.
26. *Luria A.* Principles of neuropsychology. M., 1973.
27. *Pavlova L., Romanenko A.* Systemic approach to the human being brain psycho-physiological investigation. Science, 1988, 208 p.
28. *Shmelev I.* Third signal system. In: "Golden section". M., 1990, p. 234 - 271.
29. *Samosiuk I., Lusenkok V., Idmansky Y.* Non-traditional methods of

- diagnostics and therapy. Kiev 1994, p. 236.
30. *Faidysh E.* Altered states of consciousness M.; 1993, 133 p.
 31. *Sander P.* Gestaltpsychologie und Kunsttheorie. Neue Psychol. Studien, 1931, Bd. 8, S. 311—313.
 32. *Fechner G.* Vorschule der Aesthetik. Leipzig, 1876, Thl. I, S. 264.
 33. *McCulloch W.* Embodiments of mind. Cambridge: MIT-Press, 1965, p. 402.
 34. *Swistun T. (Cited by Subbota A.).* "Golden section" in medicine. In: Intern. medical reviews, 1994, v.2, N4, p. 229—238.
 35. *Subbota A.* Golden Section ("sectio aurea") in medicine. S. -Petersburg, 1996, p. 167.
 36. *Mautaevev M.* Harmony is an appropriateness in nature. In: "Golden section". M., 1990, p. 130—233.
 37. *Terner F., Poppel E.* Poetry, brain and time. In: "Beauty and brain". Myr, 1995, p. 74—96.
 38. *Zagrantshev V., Kozlov V.* Harmonization of concentrated-kinetic potential under the influence of mental relaxation. In: "Physical Culture, Sports and the Nation's Health". Intern. Congress, S.-Petersburg, Russia, 1996, p. 172.
 39. *Bundzen P., Unestahl L-E.* Theoretico-experimental grounds of the development of mental training technology. Bulletin of Baltic Academy, S.-Petersburg, 1997, p. 7—15.
 40. *Ilyukina V., Sychev A., Shcherbakova N., Baryshev G., Denisova V.,* The omega-potential: A quantitative parameters or the state of brain structures and individual. Fiziologiya cheloveka, 1982, v. 8. N5, p. 721—733.
 41. *Shushardzan S.* Health noted. M., 1994, 170 p.
 42. *Voss R.* Random Fractals: Self-affinity in noise, music, mountains and clouds. Physica D. 38, 1989, 362—371 p.
 43. *Iliukhina V., Zabolotsky I.* Power-scarce states of healthy and sick persons. S.-Petersburg, 1993, 192 p.
 44. *Tavaa Luvsan.* Traditional and modern aspects of oriental reflexo-therapy Science, 1986, 573 p.
 45. *limansky Y.* Cited by n. 29.
 46. *Korotkov K.* Effect of Kirlian, St-Petersburg, 1995, 236 p.
 47. *Mutdel P.* Energy Emission Analysis. New Application of Kirlian Photography for Holistic Medicine, Synthesis, W. Germany, 1986, 197 p.
 48. *Kuris I.* Biopowerplasticity. S.-Petersburg, 1996, 56 p.

49. *Kastrubin E.* Trance states and "field of sense". M., 1995, 281 p.
50. *Gottwald F., Howald W.* Selbsthilfe Durch Meditation. Mvq-Verlag, 1993, 173 p.
51. *Gorf S.* Beyond the limits of brain. Birth, death and transcendence in psycho-therapy, M., 1992, 335 p.
52. *Kass J., Friedman R., Lasserman J., Zuttermeister P., Benson H.* Health outcomes and a new index of spiritual experience. J. Sci. Study Religion, 1991, 30, p. 203—211.
53. *Korotkov K.* Luminescence after life. St-Petersburg, 1996, 136 p.
54. *Hawks S., Hull M., Thalman R., Richins P.* Review of spiritual health: Definition, role and intervention strategies in health promotion. Am. J. Health Promot., 1995, 9, p. 371—378.
55. *Paul P.* Philosophical theories of the beauty and brain scientific investigation. In: "The Beauty and the brain. Some biological aspects of aesthetics". Myr, 1995, p. 15—29.
56. *Kupalov P.* Study on the reflex and reflex activity perspectives of its development. In: "Philosophical problems of physiology and psychology". M., 1963, p. 106—156.
57. *Bundzen P.* Neuro-dynamic correlates of taking decisions. 1981, p. 47.
58. *Seregin V.* Consciousness as a system of inner vision. J. of higher nervous activity, 1994, 44, N4—5, p. 627—639.

ОСНОВНАЯ ЛИТЕРАТУРА ПО МЕНТАЛЬНОМУ ТРЕНИНГУ

1. Mental Training for Sport and Life in Russia.
Bundzen P., Unestahl L.E., St. Petersburg, 1993
2. Система психотренинга и психопрофилактики "Ментальный тренинг"
Бундзен П.В., Бендюков М.А., Кирюшина А. И.
Вестник спортивной медицины России №№ 1-2, 1994, с. 35-39.
3. Основы ментального тренинга (психотренинг для всех и каждого)
Под ред. П. В. Бундзена. Запись аудиопрограмм - Бендюков М.А. Санкт-Петербург, 1994.
4. Основы ментального тренинга в спорте (психотренинг для успешного выступления в соревнованиях).
Под ред. П.В. Бундзена. Запись аудиопрограмм - Бендюков М.А. Санкт-Петербург, 1994.
5. Да, ты можешь!
Унесталь Л.Э., Санкт-Петербург, 1995, 114 с.
6. Integrated Mental Training
Unestahl L.E. Sweden Veje. 1996, 240 p.
7. Не упусти шанс!
Унесталь Л.Э., Санкт-Петербург, 1966, 23 с.
8. Mental Relaxation - Neurodynamic Markers and Psychophysiological Mechanisms.
Bundzen P., Leisner P., Malinin A. and Unestahl L.-E.
In: "Current Research in Sports Sciences. An International Perspective" 1996, Press. New York and London, pp 91-100.
9. Стресс-лимитирующий эффект ментального тренинга
Бундзен П.В., Гаврилова Е.А., Исаков В.А., Унесталь Л. Э.
Вестник спортивной медицины России, №№ 1-2, 1996, с. 18-22.
10. Mental Training - Neurobiochemical Mechanisms and Psycho-Physical Consequences.
Unestahl L-E., Bundzen P., Hypnos., Vol. 23, N 3, 1996, p 148-158.
11. Теоретико-экспериментальные основания развития технологии ментального тренинга.
Бундзен П.В., Унесталь Л.-Э. Вестник Балтийской Академии, 1997, 6.11, ст. 7-14.

NOTES