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The mathematical methods of expert information processing in parapsychology and biolocation

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The methods of mathematical treatment of information received by solving searching tasks for almost all cases which occur in practical parapsychology and biolocation (dowsing) are suggested (from screening of the people with unique abilities and to end result estimation). The questions of reliability, reproducibility, and correctness of received results and ways of their increasing are discussed. The peculiarities of application of the method of expert estimation of information by group work of extrasensers are discussed. The questions of individual attestation of dowsing operators are considered.

Phenomenal abilities of a person have their application in the solution of a great variety of problems such as search of minerals, striking oil, gas, water, trouble shooting of tubes, the solution of ecological problems, search of geoactive zones, to name but a few. The solution of this is based on the abilities of some gifted persons to percept the information by extrasensory or another way about the required objects (biolocation or dowsing).

The biolocation (dowsing) could be defined as the way of presentation of extrasensory or supersensory received information by ideomotoric motions which realize in the form of frames or small twigs rotation [1]. The operator of biolocation is the person who has a skill in biolocation method. The good results could be obtained by especially gifted persons who unfortunately are not much in amount. It makes difficult mass application of biolocation method for the solution of routine problems and does not allow to make from the skill of biolocation operators the mass profession.

The practical realization of biolocation methods requires the execution of the following stages:

1) the selection of persons with required abilities among population according to the tests, in which one's extrasensory abilities allow to solve the wider range of problems;

2) further development and consolidation of extrasensory abilities; the increasing of the reproducibility and the correctness of the obtained results;

3) training of the operators for the solutions of the concrete problems at field conditions on the training range and test benches;

4) attestation of operator's abilities both initial and periodical;

5) working out of finished resolution on the base of estimation of independent work of several operators by the method of expert estimates.

At all stages - from the selection of biolocation operators to obtaining of the practical results - the strict objective treatment of the results is necessary in order to determine the reliability of conclusions. The problem facing authors is to bring into use the objective criteria of biolocation operator's abilities.

The terms used. Often the dowsing (biolocation) is considered as a manifestation of extrasensory abilities only, but it is not nearly so. The extrasensory and supersensitive perception should be strictly divided one from another [1].

Extrasensory perception (ESP) is the perception of objects and events, which are inaccessible for direct sensuous perception, out of known organs of sense. **Supersensitive perception** is the intensified, heightened sensitivity of known organs of sense. Supersensers are able to percept the information inaccessible to usual people. However the extrasensers and the supersensers solve the same problems by different ways. The use of supersensers while solving the problems, which are in principle beyond their reach, leads to wrong results. Therefore there exists

the necessity of elucidation of one's concrete abilities. This problem can be solved in a single way by testing with the help of the objective methods [2,3]. The common feature ,which units both groups of persons, is the perception of subthreshold (on value) signals on the unconscious level with their later presentation in the form accessible to everybody (the process of verbalization of obtained information) with the help of logical terms and conceptions used by our thought. As the experience shows, the most lose and misrepresentation of information takes place just at this stage. It should be mentioned once more that the nature of the percepted signals and the mechanism of perception are different for extrasensers and supersensers. If in the case with supersenser we deal with the perception of different components of known physical fields (magnetic, electrical, heat, acoustic) or their combination, and with the chemical composition of the air and ground also, of climatic conditions, changes of the vegetation and other factors , which are barely perceptible at a glance; so in the case with extrasensory perception the nature of interaction is not clear [3].

Such strict division of supersensers and extrasensers is necessary, because the operators with different ways of obtaining of the information can solve in principle different tasks. For example the supersensers can successfully find the damage of electric cable with oil cover if this cover is damaged and the oil flew out, but if the cover isn't damaged, then this person is unsuccessful.

Each biolocation operator should solve only accessible problems, therein lies the pledge of correctness of the obtained results.

All variety of the tasks, which solved by the biolocation method, can reduce to the following:

1) the determination of local position of objects during the short-scale works. For this group of tasks are typical small dimensions of the inspected territories or the objects, small sizes of subjects of searching, the necessity of their strict localization, and small amount of possible replays. It can be revealing of damage of tubes while going lengthways the tube or revealing of position of the tube itself in search of tube on certain territory. The operator is often called for answer for concrete question, such as: where to dig, to go, where something lies, etc. Determination of the borders of small water streams, ground waters, and karsts can be related to the first group also. Most commonly in such cases the position of the object is determined by the determination of its borders.

2) Determination of the availability of the required object in large territories with further estimation of its borders. For this group of tasks are typical the large objects of searching, large dimensions of the inspected territories, large sizes of subjects of searching, the lack of necessity in strict localization. Most commonly the operator is called for answering the question: is there required object (oil, water, gas, ore, air, etc), or not? For example the determinations of oil- and gas fields, ore, or pollutions etc. at large territories, when the strict border between required object and environment is absent. The determination of the borders depends on the operator's sensibility.

The persons being able to search the objects of the same kind are recruited for solution of the tasks mentioned before. The certain diversity exists in the ways of their solution. In the first case the operator must show the place (for example, the damage of the tube) and in the second one must define the region of bedding. If in the first case the precision of definition is important for effective solution of the task, in the second case the strict definition of bedding borders is not so important - operator must determine, he is in zone of deposit or not.

For better reliability of results the data obtained by several operators (experts) are used. During the treatment and the interpretation of these data the following questions arise: what way of treatment should be chosen; whose data are more reliable. For deciding of objective conclusion on the basis of the data obtained from several operators it is necessary to take into account: firstly, coinciding results only and, secondly, individual abilities and level of proficiency of the operators. In order to describe operator's abilities objectively it is necessary to choose the indicators which can characterize this abilities and to estimate this indicators in known model situations, i.e. on tests. Since it is clear, what kind of tasks the operator will solve in future, it is an easy matter to elaborate the tests at most similar to the real situations. In accordance with the tasks №1 and №2 mentioned

above, we can offer the following tests as an examples. The organization could be changed in order to solve the concrete task.

TEST №1. There are several tubes, which are situated at an angle with each other underground. The operator must determine their position in motion on the certain itinerary (fig 1).

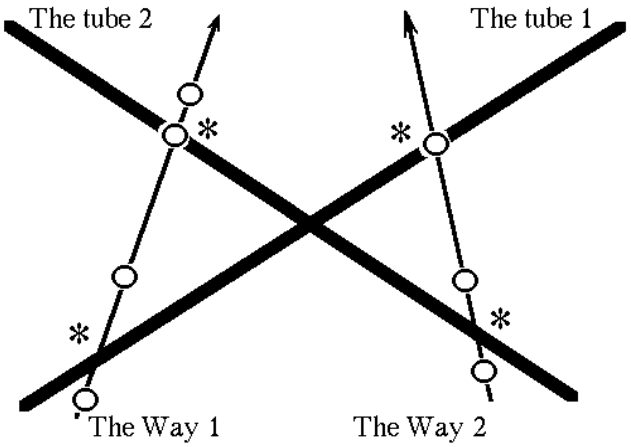

Fig 1 The places of crossing of direction of operator's motion and the tube bedding are marked by ✱, the corresponding indications of operator - by **O**. The operator doesn't know anything about the number of tubes and angles between them.

As a result of the experiment the number of operator's right indications is fixed and then the index P which characterized the reliability and trustworthy of results is calculated:

$$P = \frac{N_{right}}{N_{general}}$$

where N_{right} is the number of right indications and $N_{general}$ is the number of all indications. The indication is treated as a right if it hit some neighborhood of the tube of width $2d$. In this case d is the parameter of the test (the precision of localization of the object); the value of this parameter the customer sets beforehand. The indicator d can have an influence on the results of testing, but it doesn't characterize the error of operator's readings.

Since d influences on the results of testing, it is obviously, the situations are possible (when the value of d is large), when the operators with different abilities have equal values of index P. In order to reduce, as far as possible, the influence of choice of d on the results of testing, we suggest to introduce one more index D of the quality of operator's work :

$$D = \frac{\sum d_i}{n}$$

where d_i is the distance between the operator's indication and true location of the tube in the case of right indications and n is the number of right indications. The index D characterizes the accuracy of operator's indications which is highly essential while solving the first task.

Thus, the operator's abilities can be characterized by two indexes $\{P, D\}$, which values are estimated according to the results of the execution of the test.

It is useful to input one more index Q of operator's work, which can characterize the possibility of omission of the location of the tube:

where Q_{missed} is the number of omissions. This index supplements the index P and allows to separate the operators mistakes of different nature. The two situations are possible: first, if the amount of false indications is great (in [5] the term "hyperdiagnostics" is used) and second , when the amount of such indications is small, but the amount of omissions is large.

The way of determination of indexes $\{P, D, Q\}$ has statistical character, that's why in order to increase the reliability of testing one should repeat the test several times (~20) and treat the results jointly. For this purpose it is only necessary to change the direction of motion of the operator. In doing so it is naturally to watch the operator's state and avoid overstrain and tiredness.

TEST №2. The operator is disposed in different points inside the region with known zone of the mineral bedding (for example, the crossings of uniform net) and is asked to determine, if he is inside the zone of deposit or not (fig 2).

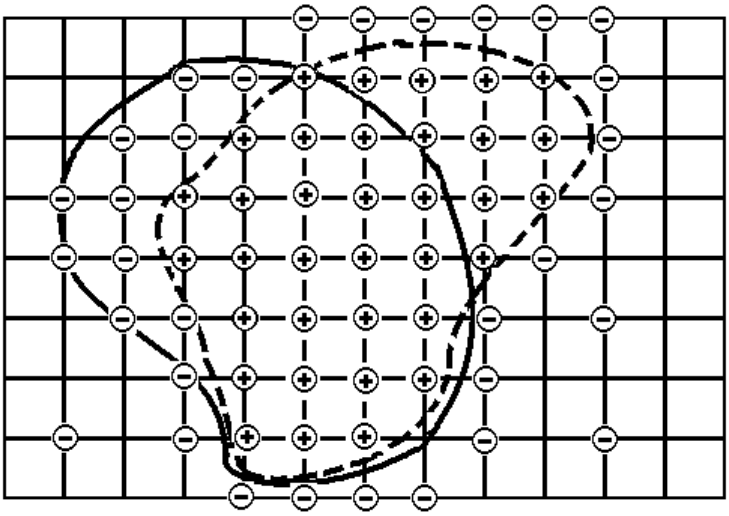

Fig.2.

-—— - the border of deposit or another object.
- - - - the estimate of the border of deposit (object) according to the results of biolocation search.
(+) - the indication of the operator at the presence in the zone of object.
(–) - the indication of the operator at the absence of the required object.

As a result of the test the number of right answers N_{right} is fixed and the index $P = \dfrac{N_{right}}{N_{general}}$ is estimated. $N_{general}$ is usually chosen equal to 20. By analogy to the first test the index $Q = \dfrac{N_{wrong}}{N_{general}}$ can be input, where N_{wrong} is the number of the wrong answers. The difference in the determination of P and Q in comparison with the first test consists in following: $N_{general}$ is fixed (the parameter of the test) and $N_{general}$ is different for different operators. In this case it is not necessary to input the additional index $Q (Q = 1 - P)$.

Let us consider how introduced above indexes of operators(experts) qualification are used **in real situation** in the case of joint data treatment from several operators.

The first task. As a result of investigation of a part of the tube of L length by M operators the following indications concerning the location of damages are obtained:

$$X_{i,j} \in (0, L)$$

where i is the operator's number, $i = 1....M$; j is the number of indicated point of damage, $\omega_l = N_{shown}/m$, m_i is the number of damages according to the indications of the i-operator.

The abilities of each operator are described by the couple of indexes $\sum N_{suc}$, where the parameter P_i characterizes the reliability of the operator's indications, and D_i characterizes the possible error in the determination of the location of damage. The indications of each operator are naturally described by the intervals $2D_i$ length and with the center in $X_{i,j}$ point.

$$I_{ij} = (X_{ij} - D_i; X_{ij} + D_i)$$

In this case the whole of length $(0, L)$ will be divided by the borders of intervals I_{ij} into subintervals Δ_l with certain weight:

$$\omega_l = \frac{\sum^* P_k}{\sum_1^m P_k}$$

where the sum $\sum^* P_k$ consists only of the indexes of those operators, who indicated the given interval Δ_l. Obviously the greater is the value of ω_l, the greater is probability that the damage is just at this subinterval.

Let us consider some possible extreme cases in operator's work and their description using mentioned above method.

The case №1. All the operators are about the same professional skill (i.e. $P_i \approx P$, $D_i \approx D$ for all $i = 1...m$). Then the search of damages should be started from the sector shown by the majority of the operators (In this case $\omega_l = N_{shown}/m$, where N_{shown} is the number of the operators who showed Δ_l interval and m is the general quantity of the experts).

The case №2. The qualification of one of the operators is much stronger than the others: $P_k >> P_i, i \neq k$.

In this case the intervals shown by this operator should be paid first and foremost attention regardless of indications of others. In our method of treatment the sequence of intervals of searching of damages depends on the decreasing sequence of their weights:

$$\omega_l = \frac{P_k + \sum_{j \neq k}^* P_j}{P_k + \sum_{\substack{j=1 \\ j \neq k}}^m P_j}$$

In the end of the consideration of the first task it is necessary to describe quantitatively the probability that the damage could not be found at all. It is naturally can be done while using the Q_i indexes. Then the probability of non-revealing of damage $P_{negative}$ is equal to:

$$P_{negative} = \prod_{i=1}^{m} Q_i$$

It can be estimated a priori before the beginning of the experiment. If the value of $P_{negative}$ doesn't comply with the necessary requirements then the number of the operators should be increased or some of them should be replaced by more professional skilled.

The second task. The investigation of rather lengthy territory is made with the purpose of determination of the deposit. Each operator is disposed in definite points and asked to determine, if he is in the zone or not. Let us present the result of each operator as a lattice with pluses and minuses in its units (pluses and minuses correspond with positive and negative answers). As a result of joint treatment of answers of all operators (experts), every unit of lattice will be correspond to following number:

$$R = \sum\nolimits_1 P_j - \sum\nolimits_2 P_i$$

where the first sum presents the positive answers and the second sum presents negative ones. Roughly speaking if $R > 0$ for certain unit, then we are in the zone of the deposit, if $R < 0$, then we are not.

Since the small dispersion of the parameter R can be explained by accidental reasons, during drawing the borders of the deposit the point with $R > R_{\lim} > 0$ should be outlined. The parameter R can be expressed in percents:

$$R\% = \frac{R}{\sum_{1}^{m} P_j}$$

In this case the lower border $R\%$, which characterizes the reliability of the determination of the zone of deposit, is easily established (for example, 65%). During the interpretation of real data, if the value of R at the investigated interval fluctuates by accidental way near zero (i.e. there are no possibilities to establish the borders of the deposit), then the experiment (expertise) should be repeated with the heightened opinion to the selection of the operators (experts). The accidental fluctuations of the R value (discrepancy of the operator's answers) can be explained by the fact that the operators of different skill are presented in the group and the answers of low-skilled operators mars the whole picture. The selection of the operators-experts is a primary and essential stage of the investigation. In so doing three main principles should be followed:

1) the operators should be approximately the same skill, what can be determined by the special tests;

2) the operators must be the persons with independent opinions and be not amenable to somebody's influence; also they must be able to concentrate on the object of the investigation;

3) if the operator's answers disagree, it is worth while to acquaint everybody with the results of others and to repeat the experiment (in accordance with the feedback principle)(if operators with independent opinions !). The treatment of the repeated results should be made following the scheme, mentioned above.

As it is shown from the practice, in the real situation it is impossible to make the same experiment under the same conditions, what is necessary for strict statistical estimation of P, D, Q indexes which characterize the capacity for work of operators. That's why after estimating P, D, Q by tests it is important to take into account the extrasenser's work during the long period of the time, because for practicians the reproducible of reliable results is important. The reproducibility can be objectively estimated only on the bases of analysis of extrasenser's work during the long period of

time. It is necessary to take into account not only successful works of the person, but the unsuccessful ones too.

The reproducibility of the reliable results K_{rep} can be calculated by the following way:

$$K_{rep} = \frac{\sum N_{suc}}{\sum N}$$

where $\sum N_{suc}$ is the sum of successful results, $\sum N$ is the sum of all solved tasks.

The reproducibility of the operator's work can be considered as satisfactory if K_{rep} >65%. The index K_{rep} should be counted over again after each operator's work. After the long time of work the operator should be certificated again in order to more accurate definition of values P, D, Q.

The suggested approaches allow to describe mathematically almost all the cases, which could be met in practical parapsychology and biolocation, from the selection of the persons with phenomenal abilities to yielding of the practical results.

References

1. Lee A.G. Russian explanatory dictionary of parapsychology and the classification of parapsychological phenomena., - Parapsychology in the USSR, 1992, N2, pp 54-58. (in Russian)
2. Chunovkina A.G. A Statistical criterion of the revealing of extrasensory abilities of a person. - Parapsychology and Psychophysics, 1992, N3, pp 57-64. (in Russian).
3. "From the Editorial Board" - Parapsychology and Psychophysics, 1992, N3, pp 38-40. (in Russian).
4. Lee A.G. About some methods of investigation of certain unusual phenomena of human mentality. - Parapsychology in the USSR, 1991, N2, p34-38. (in Russian).
5. Balashov V.I., Lee A.G., Zavertkin I.A., Timoshkin A.S., Kazakov B.V. Practical use of proscopy and biolocation for diagnosis of pipe- and heat-line damages. - Parapsychology in the USSR, 1991, N1, pp 51-55. (in Russian).