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IMAGINATION
the logic of

• a teachers' manual

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THE LOGIC OF IMAGINATION

Imagination is acknowledged as a main component of creative thinking. In this book, the author generalises and classifies the well-known methods from the «Developing Creative Thinking» course on the Innovator's Tasks Solution Theory (ITST), and suggests new methods of activation and development of imagination.
A special feature of the exercises suggested in the book consists, besides their systematic organisation, in the presence of algorithms that promote their doing; the algorithms form habits of manageable imagination and considerably widen the quantity of possible versions of the solution.
The book is intended for specialists in the methodology of teaching, teachers of the primary and secondary school, practical psychologists, students of pedagogical institutions. It can also be useful for many readers interested in issues of developing imagination.

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Introduction

As far back as in the 20s L.S. Vygotsky has stated that one of the most important issues in psychology and pedagogy is the question of children's creativity, of significance of creative work in general development and maturation of children. Above 70 years passed, and yet this problem is not of decreasing interest; on the contrary, it arrests more attention. With increasing rate of purposeful practical activity, when a result is required instantly, in concrete life circumstances, such requirements to developing personality have increased as the abilities to understand new phenomena, to reject one's settled opinion under influence of circumstances, to reveal a problem where it is usually invisible, to elaborate fresh ideas. There appeared the necessity in a new type of personality that would be able to make decisions on its own, to make its choice consciously, to respond flexibly to changing circumstances, and to create new circumstances independently. These requirements find their satisfaction in the features of personality which psychology defines as "creative."

Thus, the modern social and economic conditions of functioning society oblige the education system to pay more attention to problems of creativity and to formation of creative personality qualities in the process of upbringing and education.

Explorations of the nature of creativity have revealed qualities of personality, peculiarities of its thinking, and conditions that promote its development. However, as noted by scholars, the available information is not realized in practice to form creative potential of the society.

"It is necessary to pass from laboratory investigations and detecting ofpresence/absence of natural endowments towards development of natural gifts on the base and by means of consciously organized lessons of creativity, towards psychological training creative teachers"

(A.M. Matyushkin, [8]).

By present, a number of fundamental studies has been carried out in the countries of the CIS and abroad; these investigations have allowed to define basic creative thinking strategies which are the mainstays of personality's intellectual constitution. Components of creative thinking, regardless of the kind of activity, have been described by L. Thurstone, G. Guilford, W. Lowenfeld, P. Torrance, etc.; the main preconditions for children's creative activity have also been revealed (A.M. Matyushkin and others).

These investigations proved to be the base upon which the gifted children teaching programmes, as well as the methodological principles which—when applied systematically—are directed towards formation of creative abilities (V.A. Molyako, E.I. Kul'chitskaya, N.I. Litvinova, N.B. Shumakova), are being created [2].

The elaboration of programmes for activating and developing personality's creative potential comes up against the absence of methodological tools which would promote producing creative tasks and moreover formation of "skills" of creative thinking in teaching process itself.

The aim of this manual is to define and characterize those thinking components which contribute to formation of creative responses, and to form corresponding thinking habits through intellectual training and by means of corresponding methodological tools and use of concrete exercises which prove in our case to be teaching patterns.

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PART 1

THE PSYCHOLOGY OF CREATIVITY

1.1. THE ISSUE OF CREATIVENESS AS A SUBJECT OF PSYCHOLOGY

The necessity to understand the nature of creativity arose as a result of need in influence upon creative activity to increase its efficacy. As far back as philosophers of the Ancient Greece in their teaching systems aspired to apply the methods which would develop creative thinking in their disciples. Afterwards one began to seek for more active forms of influence upon human psyche, which would allow to manage creative activity.

At exploring the creativity problem, one should reckon with the following:

1. In the course of historical development, not only means and forms of creativity changed but so did the subjective factor of the development—man.

2. Not only typical features of social life find their culmination in creativity but so do those psychological peculiarities of different people which were provoked by social development.

The psychology of creativity arose as a science at the turn of 19th—20th centuries. It considered creativity as the psychological process of forming new phenomena and as the aggregate of personality's features that would provide its participation in this process.

The science began with the stage of speculative psychological knowledge. Psychologists described the circumstances of producing great creations of science and art in their integrity. Sources for the descriptions were biographies, autobiographies, memoirs, fiction. Researchers explored the nature of creativity, stages of creative process, faculties for creativeness, and features of creative personality; they distinguished features of genius expressed in peculiarities of perception, intellect, psychological nature, motivation system, and system of values. There were not, however, means of penetration into the essence of the phenomena that were being described. Since psychological methods of obtaining initial data were limited to selfobservation, subconscious processes were considered to be a central mainstay of creativeness.

With development of experimental approaches to the psychology of creativity, one began to use active methods of obtaining initial data, such as tests, questionnaires, interviews, experiments. The investigation of separate features of creative activity became typical. Psychology considered

phenomena of creativeness from many sides, but the grounds for distinguishing separate elements were still subjective and poorly organized. As demonstrated by later investigations, conscious and subconscious, intuitive and intellectual sides of personality are mutually complementary.

Up to the mid-20th century, psychology associated creative abilities with intellectual development. The need in defining intellectual abilities provoked elaboration of IQ-tests. Investigations of many researchers have shown, however, that creative abilities do not directly depend on intellect and knowledge. Exploration in creativity is complicated by the fact that, at estimating creative characteristics, a researcher deals primarily with the quality of a phenomenon. The investigation of creativity based upon scientific material proper was carried out in 1959 by a group of researchers under supervision of G. Guilford with use of the statistic data factor analysis. At the same time, a series of experiments based upon art creations was conducted by V. Lowenfeld and K. Beittel independently of Guilford. Juxtaposition of results of the experiments has allowed to distinguish eight essential criteria suitable for differentiation.

1. *The ability to define a problem.*
2. *Fluency, the ability to distinguish as many as possible potential sides and associations in a problem.*
3. *Flexibility as the ability, firstly, to understand a new concept, secondly, to reject one's settled opinion.*
4. *Originality, the ability to depart from a schedule.*
5. *The ability to regroup ideas and associations.*
6. *The ability to abstract or analyse.*
7. *The ability to concretise or synthesise.*
8. *The sensation of harmony in organizing ideas* [1; 2].

Besides, the experiments have demonstrated that creativeness in art and that in science have much in common, which allows to apply creative abilities cultivated in art to science and vice versa.

Once results of the experiments provoked hopes that scientists would ultimately obtain the means of recognizing creative personality. Further investigations, however, did not verify efficacy of the experiments, as creativeness in its integrity defy exhaustive definition by means of the factor analysis.

Psychologists of the CIS have associated the problem of creativity with investigation of results of productive thinking by means of the **problem situations method** (S.L. Rubinshtein, A.N. Leontyev, L.L. Antsiferova, A.V. Brushlinsky, T.V. Kudryavtsev, A.M. Matyushkin, Ya.A. Ponomaryov, O.K. Tichomirov, and others). The results of these investigations, however, notwithstanding that their range was rather broad, did not yield a complete concept of parameters of creative thinking because the method did not provide revealing new regularities, did not take into account the moment of raising a new problem by a thinker, and ignored the importance of purposefulness.

Ya.A. Ponomaryov in his collection "*Trends in development of psychological science*" writes that one of the most essential mends in the psychology of creativity is **the displacement of the action principle with the interaction principle**. Here also belongs the displacement of the activity approach with **systemi**c approach. Nevertheless, viewed as an individual case of the systemic approach based upon interaction and not upon action (activity), activity approach remains rather efficient.

Another tendency consists in unification of cognitive and personality formations. Psychological mechanisms of shaping and functioning both of intellect and of personality prove identical with each other.

The comprehension of importance of personality's subjective factors in their interaction with objective ones have led during the last decade towards closer attention to personality factor at investigating creative processes. Thus psychology of creativity, commencing to consider personality with the whole range of its qualities as an object for investigation and following other sciences, takes the systemic (holistic) approach as its scientific tool [3].

> *"Another important tendency, to some extent lying beyond the domain of psychology of creativity but closely associated with it, consists in comprehension of creativeness as development. There becomes stronger the idea that dialectics, being the theory of development, includes also the theory of creativity. Such an idea brings essentially fresh light onto the principle of interaction as a source for development. It makes investigation of interaction more important for comprehension of development, reminds persistently of firm associations between development and interaction, insists in understanding dialectics as the theory of movement, i.e., interaction and development... Thus, psychology of creativity converts into the science regarding the mechanism of developing living systems, the mechanism based upon a signal concept of their intrasystemic interaction*"
>
> **(Ya.A. Ponomaryov [4]).**

1.2. THE DEFINITION OF CREATIVITY

Literature produces variety of definitions for creativity. Admitting that "creativity is almost endless" and therefore "creativeness is difficult to define precisely" as it "involves every sense—vision, taste, smell, emotions, and probably extrasensory perception as well," the famous American psychologist P. Torrance, having surveyed definitions offered by different specialists, have distinguished in them such most common features as novelty either in the way of creation or in the result; originality; the ability to find and establish different interrelations; the ability of thinking to analogise as an essential element of creative thinking; the ability to combine and select from multitudinous potentialities, and then to synthesise and associate elements in a new original way; the intellectual ability to search for, raise, and settle new questions [4]. Reasoning from what this manual is intended for, the author accepts the definition of creativity as "the process of creating or discovering something new and previously unknown to a given particular subject" [5].

Consider in greater detail results of the long-term and multistaged investigations conducted by P. Torrance who tried to find methods of measuring and criteria of manifestation of creative abilities. The hypothesis of Torrance was based upon the assumption that test behaviour has no analogy in teaching behaviour and real life, therefore testing could be a model for investigation of creativity nature.

In studying the nature of creativity by means of testing, Torrance has introduced the following basic principles into his testing system;

—introduction of an uncertain impulse;

—unclosed character of a task;

—polysemy of answers;

—taking off strict temporal limitations.

The results of the longitudinal (5—7—12—22 years) investigations have revealed correlation between testing behaviour and achievements in real life. The following criteria were chosen for estimation of creative behaviour of adults:

1. The quantity of publicly recognized creative achievements (patents, innovations, novels, pictures).

2. The quality of creative achievements as applied to imagination offuture career (e.g., what career do you want to make? what office or salary do

you want to get? what would you like to do in the ten years to come if you could?)

3. The quantity of manifestations of creative style in life achievements unrecognised publicly (organization of non-formal groups, arrangement of one's house, elaboration of a new trend in education).

The same criteria were applied to students of elementary school within their school programme. Ultimately, Torrance concluded that children qualified by his tests as creative persons would actually show creative achievements in their afterlives.

The question is, however, what are the components of habits creative thinking is based upon, and how are they to be trained? On the base of using the figural forms of the TTST (the tests of Torrance) the components of thinking were revealed that promote manifestation of creative abilities:

1. *Quantity of answers and their clarity.*
2. *Flexibility, the range of answers' diversity.*
3. *Unusualness, originality, or rarity of an answer.*
4. *Thoroughness of elaboration, the degree of detailed consideration of an answer.*
5. *Abstractness of an answer, level of abstractness in answers.*
6. *Resistance to closing unfinished figures or the ability to leave them opened.*
7. *Emotional expressiveness of an answer.*
8. *Expressiveness in speech, insertion of answers in context, communication of context to them.*
9. *Movements or actions done while answering.*
10. *Expressiveness of headings, the ability to convert a figural image into a verbal one, doing it emotionally.*
11. *Synthesis or combination that unite two or more figures, and creation of a coherent answer.*
12. *Unusual visualisation, consideration, and placing figures into an unusual visual perspective.*
13. *Inner visualisation, viewing an object from inside.*
14. *Expansion and exceeding the bounds of an expected result.*
15. *Humour, juxtaposition of two or more incompatible elements.*
16. *Richness of imagination, diversity, living power, intensity.*
17. *Colourfulness of imagination, exciting, appealing to feelings, emotions.*
18. *Fantasy, unreal figures, sorcery, fairy-tale personages, personages of science-fiction.*

It is in creativeness that we see the integrity of logical and imaginative components of thinking and their association with emotional field. Results of the investigation, as reckoned by Torrance, can be used in practice and ought to became the base of creation of teaching units. In other words, in order to form skills of creative thinking one requires the exercises with corresponding tools and in corresponding circumstances.

Torrance distinguishes 5 principles which a teacher has to follow to reward creative thinking:

1. *Respectful attitude to unusual questions.*
2. *Respectful attitude to unusual ideas.*
3. *Show children that their ideas have value.*
4. *Provide opprotunities for self-learning and reward independence in learning.*
5. *Provide a time for non-evaluated practice or learning.*

The last principle requires some explanation. Outer criticism can produce inadequate response and cause offence to a child. Children need a time during which they are not to be evaluated, so that a child would form its ideas without encumbrance [6].

The attempt at creating "teaching units" for formation of creative thinking components, which were described by Torrance and applying which does not require special knowledge, have led to elaboration of the task patterns offered below in the present manual.

1.3. THE PECULIARITIES OF CHILDREN'S CREATIVE ABILITIES

The children's creative abilities possess a wide range of individual differences. The exterior indications of creative development are varied. They surface in more intensive development of speech and thinking of a child, in early curiosity and keenness. According to A.M. Matyushkin s concept of creative gift, the most general attribute and structural component of children's creative potential are cognitive requirements constituting the psychological basis for domination of cognitive motivation. This motivation is displayed in research activity, in more intensive sensibility to newness of a stimulus or situation, to revealing the new in the usual. Cognitive motivation and research activity manifest themselves in high selectivity of a child in respect of new objects, in its preferences with regard to colours,
sounds, shapes, etc.

General research activity is characterized by breadth and purposefulness. It manifests itself in a child as very broad curiosity.

Research activity is manifested in different ages in different ways. By 3 ___5 years it expresses itself as independent setting questions and problems in respect of new and unknown phenomena. A child develops by searching for answers for its questions and problems which determine preferences in children's creative teaching.

From 5—6 years the basic constituent of creative development of a child becomes problematic character of thinking. A child searches for contradistinctions and discrepancies in its own setting questions and problems. Even failures produce research activity.

At the age of 8—12 years, the process of search and investigation ends with solution of problems and discovering unseen and not defined obviously elements and relations which are invisible in available knowledge [7]. . .

A.M. Matyushkin, like western psychologists, holds that originality
is a condition sine qua non for creativity. Originality expresses the degree of unusualness, non-standardness, suddenness of a chosen solution as compared with others.

A necessary constituent of general creative gift consists in the degree of prognostication which is the integral indicator of creativity. An important distinctive element of the gift is the presence of estimating function in all complicated psychological structures. The ability to make estimation includes the ability to comprehend development of one's thought as well as others' thoughts, deeds, and actions. The ability to estimate provides the possibility of self-control, child's confidence in itself, its abilities, its solutions, and thus determines its self-dependence.

A. M. Matyushkin distinguishes the following constituents of the creative gift as a **general** psychological precondition for creative development and formation of creative personality:

a) predominant cognitive motivation;

b) research creative activity manifested in revealing newness, in setting and solving problems;

c) the possibility of achieving original solutions;

d) the possibility of prognostication;

e) the ability to create ideal patterns providing aesthetic, moral, and intellectual estimations **[8]**.

The result of analysing abilities and psychological characteristics of gifted children have allowed to reveal the qualities determining creative personality, of which development and formation ought to be the objective of the education and upbringing system. Naturally at least two problems appear:

1. Does the main factor, basic for creativity itself, exist? the factor without which one cannot speak of creative process at all?
2. Do the methods exist which develop the above factor as one of creative gifts?

In other words, **is it possible to train anybody in creativity?**

1.4. IMAGINATION AS A BASIC CONSTITUENT OF CREATIVITY

One of the first investigators of creativity as psychological process, P. Engelmeer (1910), has divided this process into three parts:

—the act of advancement of a hypothesis;

—the act of creativity;

—the act of a logically developed thought **[9]**.

The multitudinous posterior investigations, keeping to the basis of the theory, were concerned with consideration in detail of individual "acts," the latter being naturally split into smaller events. Thus, G. Wolles (1924) divides the stage of advancement of a thought into two parts and ultimately singles out the four phases of the process:

—the phase ofpreparation of an idea;

—the phase of maturation of a concept;

—the phase of enlightenment;

—the phase of verification of an idea **[10]**.

A yet more detailed subdivision of creativity was offered by G. Celier (1964). Analysing the question *Who has to engage in science and what are the abilities necessary for that?*—he has distinguished 7 stages in the mechanism of creativity having introduced as the first one "Love or at least desire. The ardent craving for cognition." That is, Celier have introduced the notion of psychological motivation to the theory of creativity.

Among the rest six stages, four are directly connected with the creative stage of raising an idea, and the last two—with its verification and - application in reality. To Celier, creative process goes in the following way: "*Initially, we gather facts by means of observation, accumulate them in memory, then arrange them in the sequence determined by* **rational thinking** (bold emphasis added—**L.Sh.).** *Sometimes it is quite sufficient to make an acceptable decision. However, iffacts defy formation of harmonic picture after conscious process of meditations and making conclusions, intellect with its settled habit of arrangement has to leave and make way for fantasy. Moreover,* **unobstructed imagination supervises the emanation of countless associations, more or less random** (bold emphasis added—L.Sh.). *These associations resemble dreams, and an ordinary mind would reject them as obvious nonsense. But sometimes one of manifold mosaic pictures, created by fantasy out of the kaleidoscope of facts,*

becomes so close to reality that it causes intuitive enlightenment which as though pushes a corresponding idea into conscience. In other words, **imagination is the**

cious ability to combine facts in new ways, and carry appropriate images to conscience" (bold emphasis added—**L.Sh.) [11].**

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confirm the well-known proposition of L.S.
agination for creativity, which was advanced as
cides with up-to-date results of psychological

definition of imagination as an element sine qua
provides:

1) *the construction of an* ***image*** *for labour product;*

2) *the creation of* ***a programme*** *of behaviour in unclear problematic situations;*

3) *the means of* ***creating images*** *substituting for actual activity (i.e., patterning processes and objects).*

Thus, imagination as psychological process allows to prognosticate a labour result (not only the finish product but also every intermediate stage) and to orient man in the process of his activity.

As distinct from thinking, which operates with notions, imagination operates with images and aims at the transformation of images so as to provide creation of completely new situations or objects existed never before. Imagination is the ability to reflect reality in new, unexpected, and unusual combinations and associations. Imagination is involved when a problematic situation are characterized by lack of appropriate knowledge and intellect is unable to define results of activity by means of the organized system of notions (i.e., by thinking). Operation with images allows to "jump over" certain somewhat unclear stages of thinking process and to do imagine the final result **[12].**

It is these peculiarities of imagination (operation with images and their transformation, the whole information being unavailable) that afford grounds for many authors to associate—pointing to imagination as the basis of human creativity—development of imagination with general psy-

chic development of children. For preschool children, imagination, according to psychical development division into periods offered by L.S. Vygotsky, is the central psychological innovation **[13,14].**

At present, ways and methods of formation of imagination in children of preschool age are intensively being developed. Four main components constitute psychological specificity of imagination:

1. *Use of visual aids and methods.*
2. *Use of acquired experience.*
3. *Presence of special personal attitude (the ability to create original designs and thoughts).*
4. *The ability to use flexibly knowledge acquired earlier and apply it creatively depending upon specific conditions and circumstances.*

On the whole, imagination as creative process implies the ability, firstly, to see the whole before the parts, secondly, to extend functions of one object to another. The condition of rising this ability is the children's ability to unite the most different objects and phenomena into a single semantic cluster.

The clear comprehension of imagination and the necessity of developing it has motivated investigators to explore the process and stages of developing imagination in children of preschool age.

At the first stage of developing imagination, such organisation of children's object activity is necessary that would produce by its originality certain imaginative and thinking efforts. That is, the first stage is connected with special visual and imaginative tasks of which conditions are offered from without, whereas the basis and objective are connected with comprehension and interpretation of their conditions.

The same trend is also actual for the second stage of developing imagination, although in this case not a situation but personal experience of a child is important.

The peculiarity of the third stage is the presence of personal role or attitude in a child, which allows it to determine independently relationships among objects and to communicate sense to them depending on an integral design or plan; a child is able to form its personal attitude that allows it to create a single semantic plot which will afterwards be actualised in reality.

Whereas at initial stages a child deals with real things, i.e., logic comes from an object to a design, at the higher level of development the contrary direction takes place—from a design to object activity. This means organ

isation of such an activity that is not strictly determined and standardised but provides independent and creative solution of a task **[15,16,17].**

In opinion of E.E. Kravtsova, for development of imagination it is necessary to provide object environment inside of which a child would be able to imagine, invent, and create **[18]**. The necessity of organizing children's activity, which would be favourable for its independent search for and distinguishing problem situations and tasks in its surroundings, was pointed out by N.N. Podd'yakov **[19].** However, any, even the best organized, object environment will be sluggish without the main personage in upbringing process—without the creative personality of the teacher **[20].**

One of the duties of a teacher is to provide the use of creativity laws for improvement of contents and motives of every student education. Therefore, assuming that the essence of human personality is connected with its requirement and ability to create, for realisation of this requirement, proceeding from results of investigations in developmental psychology, one can formulate the following rules that must be used in the structure of a creative lesson:

1) stimulate cognitive activity and revealing the new in the usual, i.e., create situations for search activity based upon the ability to recognize problems and contradictions;

2) stimulate independent setting problems and questions, i.e., comprehension of teaching material through questions;

3) contribute to revealing unseen and unclear, undetermined, associations among objects and phenomena; consider problems from different perspectives and introduce on that ground principles of integral (involving different sciences) approach;

4) form the ability to predict possible repercussions of made decisions;

5) explain teaching topics as exercises for activation of imagination;

6) form conscious thinking activity realised in thinking strategies;

7) create in a class the atmosphere of non-pragmatic attitude so that man would be the main value in the hierarchy of values.

1.5. STRATEGIES OF CREATIVE SEARCH

The rate of development of science and engineering have inevitably involved into creative search many specialists associated with innovations and elaboration of new technologies. Of especially great concern have been the question of intellectual labour efficacy; the problem have risen of purposefulness, manageability, and efficacy of creative process. The technical creativity methodology is developing, the real methodological bui st is being observed in developing methods and manuals on research and inventive practice **[21, 22, 23, 24].**

Psychologists have revealed that the creation of new ideas, objects, action principles, etc., is also provided with such basic thinking stiategies as, in particular, **combining, analogising, revealing new associations, and extrapolating function** from one object to another. The methods based upon these strategies are elaborated and broadly used in technical creativity.

Combining—joining elements into more or less unusual sets—-is the basic "technique" for imagination; combinations can be both original and absurd. Being occupied with choosing certain traits, an artist, however, acts consciously, guided by a design [25]. Similar processes of operating objects and their interrelations are applied in technical creativity at searching for new ideas and original solutions, therefore methods of technical creativity may be used for development of creative imagination **[5, 26, 27, 28, 29, 30].**

The combining as the possibility of systematising the process ot selecting versions is the essence of the **morphological analysis method** elaborated by Swiss astrophysicist F. Zwicki in the 1930s. 1 he method rests upon the systematic selection of most important features of object or technology to come. A new combination of these features allows to obtain a new object or property.

Analogising as conscious search for analogies (the analogy is understood as establishment of similarity) was introduced in the process of solving tasks by W. Gordon, the author of **synectics** method. Gordon proposes to use four types of analogies for activation of thinking and for control over it in the process of making decisions:

- *(he **direct analogy** suggests to apply methods used in other branches of science and engineering, that is to study how they solve similar problems,*

*—the **personal analogy**, or **empathy**, offers to take the image of an object, to feel its state, and to find and offer the most optimal version of solution on the base of one's sensations;*

*—the **symbolic analogy**—the selection of brief symbolised description of a task or an object, usually in the form of combination of a noun with an adjective which characterize paradoxically the essence of an object. The analogue for the symbolic analogy in fiction is oxymoron as is metaphor in poetry;*

*—the **fantastic analogy** offers to state a task in terms of tales, myths, legends, as well as to find solutions in fantastic fiction.*

As one can see, the increase of manageability of creative process is provided with more detailed—to revolve the whole search field of possible analogies—understanding of the notion **analogy**. Such a consideration in detail communicates sufficient instrumentality to the method and allows the use of it in the teaching process, children at the age under school included.

Revealing new associations in technical creativity is provided with the **systemic approach**. The skills of revealing most diverse yet associations are rather rapidly elaborated with use of the **systemic operator** (another title for it is the **scheme of multi-screened thinking**).

The **extrapolation of functions** from one object to another is the core of one of the first methods of technical creativity elaborated by F. Kunze, professor at the Berlin University, in the 20s (**the catalogue method**). In the 50s the method was improved by Ch. Whiting and received the title focal objects method. In its base there is artificial communicating features of other random objects to an object to be improved. In addition, new features communicate new properties to an object to be improved, which provides it with the ability to perform new functions **[21,32]**.

The aforementioned methodological principles reflect the strategies of creative thinking activity; therefore, as shown by investigations, they can be used as *"the system of influence upon creative activity ofa subject—the system which both is the general training and stimulates separate cycles of creative solving a task*" **[5]**.

The **strategies of thinking** serve as the logic tools whereby imagination can realise itself. This is especially expressed in fantastic fiction which tells about the unusual, not existing, about something that was not, is not, or is not as yet...

Analysis of science-fiction has allowed to reveal a range of methods for constructing fantastic ideas. The analysis has also demonstrated that the work of creative imagination possesses the regularities which can be used to convert common objects, facts, and phenomena into fantastic ones **[33, 34]**.

The presence of a set of methods, allowing to create consciously and purposefully fantastic images by means of thinking operations and analogous themes applied for creation of new technical objects, affords grounds for speaking about integrity of creativity methods as well as about the actuality of **logic of imagination [64].**

PART 2

PRACTICAL METHODS IN DEVELOPING IMAGINATION

The creation of a strict classification of methods is not yet possible: the components of creative thinking are so interrelated and closely connected that it would be scientifically incorrect to assert that a given method develops a rather specific component. Such a classification should be performed according to the whole range of features, and this work is still waiting for its investigator. As to the present, to orient ourselves if only to some extent in the material offered below, one can conditionally divide the imagination developmental methods into four large clusters according to the sources they were taken from [28]:

1) *the methods of psychological activation based upon imaginative thinking.*
2) *the methods based upon operations of formal logic.*
3) *the methods of the "patent reserve" of science-fiction.*
4) *the methods applied in technical creativity, and those derived from them.*

Chapter 1 **BASIC NOTIONS OF THE HOLISTIC (SYSTEMIC) APPROACH**

The systemic approach to objects and phenomena is necessary for profound comprehension of economical, societal, and ecological processes.

Preparatory to describing the exercises, some **notions of the systemic approac**h are in order.

The experience of using the exercises given below have demonstrated that some notions should be introduced as tools in order to make the performance of these exercises more effective, namely: **function, subsystem, system**, and **supersystem.** These notions, in contrast to the notion of an object, are intended to orient students towards perception of the whole integrity of interrelations among object's constituents, and those of an object per se with its surroundings. To define these notions would be best of all on the example of **genetic analysis**—the history of development—of any artefact.

Artefacts, as distinct from natural objects, are considered to be the objects created by human labour. Any artefact is made in order to meet some human requirements. Therefore, the basic function of an object is the action which an object renders in the process of satisfying a certain human need.

Conduct the genetic analysis of a certain simple object, e.g., the pen. Its basic function is to make a track on paper for preserving some information. Lest to consider the whole quite prolonged and interesting history of the pen—it had begun in antiquity with sharpened stick for drawing images on sand or clay surfaces—retrace the history of the pen beginning with the quill.

Its basic function—to leave a track on paper—was performed by its sharpened end alone, not the whole pen. The quality of writing with the quill was rather low: the pen end was fast getting blunted, splashing at scratching paper, drawing a thick line, which required much ink and broad paper surface, etc. Furthermore, the time required more and more trained people, so that the quill was displaced with the steel pen that had the same purpose and action principle. Having liquidated main drawbacks of its predecessor, the steel pen became essentially different from the quill.

It first separated from the pen bar, so that the pen became consisting of at least three parts: the pen per se, the bar, or the body, and the joining design whereby the pen was fastened to the bar. Such a construction allowed to make the corpse out of less expensive and lighter materials and at the same time to extend the pen's physical and functional fitness period, because with the advent of the steel pen, in case of breakage, not the whole artefact but its defected part alone was thrown out and substituted with a fresh detail. Besides, functional potential of the pen somewhat extended as there appeared an opportunity to alternate different pens in the bar for drawing lines of different thickness. Ultimately, the pen proved to be a **system**, i.e., a unity of heterogeneous elements purposed for performing a certain function and constituting by their unification a new (systemic) feature that was absent in each of the system components. Elements of a system—parts they consist of—are called **subsystems**. Subsystems can be rather often considered systems for the elements they consist of, and so forth, up to the moment when system constituents will become simplest indivisible elements.

This subdivision is vividly seen in the subsequent advances in development of the pen—the fountain-pen and ball-point pen. Their appearance was provoked by the same human need in the increase in labour efficiency (in this case, at the expense of reducing time required earlier for repeated dipping the pen to the ink-pot), improvement of labour culture, and simplification in the use of an object.

The steel pen is, in its turn, part of the system called a **designs for preservation of information by drawing signs on paper.** This system, which is a supersystem to the pen, contains the pencil, the soft-tip pen, the brush with paint, and other systems having the same рифове but functioning according to different principles. This supersystem is a part of a yet more general supersystem of **designs for preserving information** which comprises a still broader group of "objects:" painting, photography, audio- and video recorders, computers, etc. Thus shapes a hierarchy of systems related to information and human culture.

On the other hand, the pen is made out of certain materials—wood, metals, plastics, etc. To produce and process them, different branches of industry are necessary, and those branches are connected, in their turn, with other branches. Thus each detail of the pen proves to be an element of varied systems having manifold mutual ties.

The development of systems and their hierarchic ties are vividly traced on the scheme **of multiscreened thinking** (see **Figure)**; this scheme is also called **system operator**. The minimal scheme of the system operator consists of 9 screens and includes the system with the supersystem and subsystems in the past, present, and future [22].

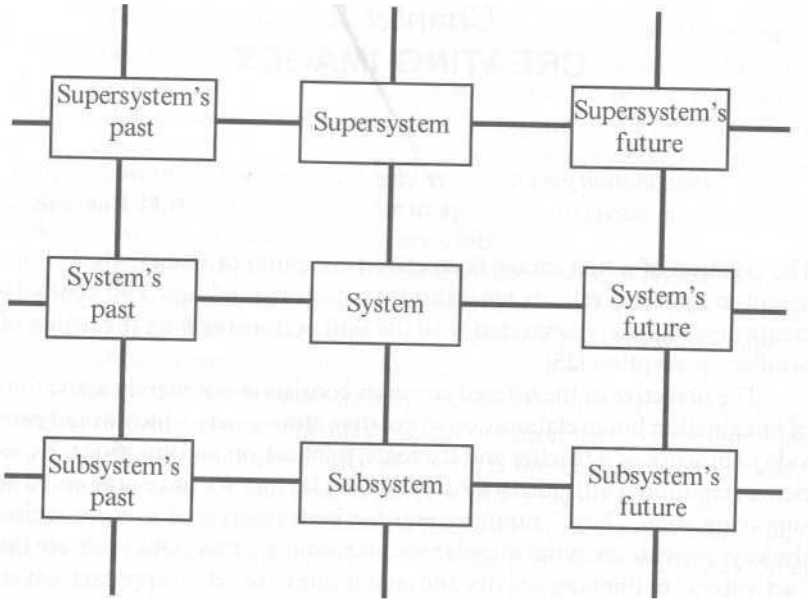


Figure. The scheme of multi-screened thinking.

The ability to reveal these interrelations and understand their significance at analysing systems is the most important function of imagination allowing to pattern systems and processes.

Chapter 2
CREATING IMAGES

Imagination generally speaking is any process going on in images.
S.L. Rubinshtein

The creation of a new image is creative perception of reality which is inherent in man and reflects his attitude to his surroundings. The ability to create new images is connected with the skill of transforming the reality of ordinary perception **[25]**.

The objective of the offered exercises consists in not merely activation of imagination but in elaboration of creative atmosphere which would provide joint work of a teacher and students, joint action and emotional experience, emotional attitude to a subject being learnt. We have attempted at supplying some "keys" (implements) for performance of every exercise; the keys provide an initial impulse for performing a task. Our tools are the "activators" of thinking activity and enable one to select an approach which corresponds to your individuality. The main thing the key contribute to is the fact that they direct but not constrain, even vice versa—they require entire independence of thinking and help to use knowledge already available.

We also hope that applying these methods in your pedagogical practice will occur not for the sake of the methods themselves, i.e., formally, but that it will become an inherent part of any topic, reasoning from the contents of material, structure, and lesson's objectives.

Each exercise is usable, depending on an object:

—in the form of a play as an "intellectual warming-up " on a lesson; it is necessary here to find the objects which would produce jokes and smiles;

—for work with basic notions and themes of a subject;

—as microchecking comprehension of basic notions and terms;

—for development of imagimtion in purposefully organized training; in this case it is necessary to carry out the analysis of one's thinking strategies and to become familiar with others' ones.

2.1. The image of a character (a figure, any symboi)

"Once upon a time there were three little sisters, " the Dormouse began in a great hurry; "and their names were, Elsie, Lacie, and Tillie; and they lived at the bottom of a well—" "What did they live on?" said Alice, who always took great interest in questions of eating and drinking.

The aim of the exercise is to activate imagination, to create emotional attitude to a symbol. Two approaches are usable here:

—one may imagin of what a character resembles; of course, younger children are to be shown objects of which the names begin from the character (one may find for each character a series of pictures with images of objects whose elements resemble the character [35]);

—let a character become entirely alive and familiar, let it have its own temper; to achieve that, one may offer a questionnaire containing questions which children answer with pleasure: *is this character tall or short? thick or thin? what colour does it have or which colour does it like for its clothes? is it good or bad? where does it live? who are its friends? what does it like to live on? what is it occupied with? what is its hobby*? and any other question.

In the imagination of Diana R. (13 years old), the character *S* proved to be a *housewife. It has the curved vertebral column, therefore it is slightly round-shouldered. It lives on soup-rassolnik; it adores children and always clasps them in its arms and presses resentful children to its warm round tummy. S is white-haired, almost without teeth, speaks mumbling and drawling words that have S. It is a good cook but some dishes it cooks are too salty. S likes salt, that is why it has arthritis and walks somewhat unsteadily.*

Now this is how differently the character *F* was seen by a pupil and a teacher:

F is a jolly character. It has two ears on one side, the slender waist; its head is not found, the arms are absent, the neck goes through the ears. F is very proud of itself and believes that it is a fantastic character: there are creatures like it on other planets.

F stands with its arms akimbo, smug, dolled up, pompous; it takes much space. It believes it is beautiful but they don't like it too much: it is awkward and quite rarely used. It knows that and wants by all means to be used in a word and often takes the place of the character V, although nobody asks it

for that. It is very happy when used twice, as ***in diffusion, effect, buffalo****. It is violet and has the character H as its friend. If one adds an arch to its right, it will turn into the unpretentious and hard-working P. But it is not to be done because in that case will disappear fakirs, fairies, and even coffee.*

Analysing and classifying association produced by character's images may yield the following clusters:

—associations with the image of a character, i.e., its pictorial form;

—those connected with the position of a character, which is especially characteristic of A and Z;

—those connected with words that include a given character;

—those connected with rules of character's spelling;

—those connected with personal emotional attitude (emotional importance of a character).

Thus, approaches to an image can be either logical or emotional-imaginative. Of greatest interest are those images which involve several approaches, as has been in the last example.

Thinking flexibility manifests itself in the diversity of perspectives from which an object can be viewed.

Creativity commences from the point where man exceeds the bounds of his ordinary approaches. Therefore, the training programme should include the following task**: to create an image of a character** by using one's new approaches.

2.2. The image of a sound

Which is it, this sound? Is it thick or thin? Broad or narrow? Fast or slow? What colour is it of? Is it good or bad? Sharp or blunt? **[36]**. Not only a word but every character, every sound causes an individual imagination in all of us.

The image of the sound Zh. It has good-natured but strict temper; it lives in yellow leaves, in rain drops, in a hot day, and also in every woman; it is felt in tenderness of hands, in New Year greetings, and in friendly handshake (Natasha Zh.).

As perceived by N., teacher, the sound *R-r-r-r* can be heard in different ways:

—spotty, watchful, indistinct, protracted, frequently taking a single note, ready to defence, and in time of need—to fighting;

—grey-black, sharp, high-tuned, often ascending up to squeal, accepting no objection, interrupting all and everything, discouraging with its crudity and boorishness.

A complex image of the character and sound *Zh* was presented by K., a teacher:

" ***This character is broad and resembles a beetle, and likewise, as a beetle, it yields a buzzing note: zh-zh-zh-zh-zh-zh!***

This sound is small, fatty; it can be both fast and slow, wears dark clothes on a rainy day; but generally it likes very much yellow gaudy clothes. It covers its kindness *with grumbling buzzing*."

2.3. The image of a complex sound

This can be any sound—a door squeak, noise of the rain, a bell calling to a lesson. Here younger children are offered the same questions as in the previous exercises. Elder children may also be offered another approach—to describe sentiments produced by a given sound, i.e., to express feelings through associations connected with a sound, to express a sound through its colour, shape.

The bell ring is jolly, clear, cheerful, modulating; it can be very impatient (Sasha K., 9 years old).

The sound of sneezing. *This sound usually sticks to people, especially in damp weather. It is sharp and sudden like a shot, and disdainful to every other. It likes to be repeated. In spite of its being extremely annoying, it makes people wish good health to the person who has sneezed. A sneezer itself has to cover quickly his mouth and to apologise to bystanders* (B., teacher).

The Silence is a very serious and thoughtful girl who always comes after her uncle Crash (O. Zhukovsky, 10th grade, Lyceum 208, Kiev).

The silence is an object embodying the absolute absence. Its existence is unquestionable but the reality denies it (Alexander Gritsay, 10th grade, Lyceum 208, Kiev).

2.4. The reverse task: recognise a character or a sound concealed behind the image

"It distinguishes itself at once among ottyer sounds accustomed to the ear. Initially, it is staccato and large like knots of a fishing net; then it is getting smaller, more indistinct, and turning into a small netlet. When listened attentively, it can produce gladness, satisfaction; however, when when it lasts long, it may be annoying. This sound tones down sharpness of light spots but, on the other hand, it makes colours more intensive and silhouettes of objects clearer" *(The noise of the rain.* Yu.K. Ivanov, a teacher in geography, Barnaul).

"This symbol likes the circle, circumference. It is on good terms with the square and the symbol of multiplication. It likes very much travelling in the Moscow subway around the Sadovoye Kol'tso. It is proud of its exactitude. It works usually with the letter R. It likes to get gifts. It wants to be the first always and everywhere" (The symbol Ti. Maximenko Sergey, 10th grade, School 8, Odessa city, 1994).

2.5. The image of an unknown word ("a sound blot")

A teacher should pronounce an unknown word representing a meaningless combination of sounds. Sounding of a word, its rhythm produce a long sequence of associations which gradually form a certain image. After 2—3-minute considerations, students ought to describe images that came into their minds **[37].**

To create a concrete image would be much easier when trying to answer the questions: who or what is it? is it a phenomenon or a condition? Younger children are to be assisted with leading questions like those described in the previous exercises. Children of preschool age and younger schoolchildren will usually draw with pleasure what they have imagined.

The exercise can be used as a "warming-up" before a lesson as well as for the changing thinking activity on logical lessons. Thereby, introducing a new term, one can also provide emotional attitude to a notion.

In order to create an unknown word, one can use words read backwards, transliterations of foreign words, Latin names of medicines and plants, and any combination of characters and syllables.

Example:
CURLEMBARUTA.

This is an animal. It looks like a cock and and the same time like a dog, eats like a cock but walks like a dog and has doggish habits (Volodya, 8 years old).

This is a being indifferent of everything but eating. It likes sweet dishes especially—bananas, souffle. It lives in Africa and has curly hair, small eyes, a normal nose, a small mouth, and four fingers on each hand; it is also very fat (Sasha, 11 years old).

This is a roll prepared of different fruits and berries with cream and egg-whites; it can be easily recognized and eaten (Seryozha, 14 years old).

This is soap-bubbles; they are called so because when they burst they sound like bubbles; this sound is yielded by a small man who lives in soap foam; he is very jolly, always laughing; he likes to talk to people and cries when stops to blow bubbles (Oksana, 13 years old).

As regards science-fiction, to create a real image of an unknown word proves to be a serious task. In his story *The World That Cannot Be,* Clifford Simak was to create the images for inhabitants of the planet Layard: *babblers, stiltsers, longihorners, donovans* (the beings that are absent on the Earth!). Thus, a donovan resembles simultaneously both the elephant and the tiger but has the bear-like hide.

The hero of the story Gevin Duncan intends to kill the enigmatic animal Zita which eats sprouts of woa from his patches. But no inhabitant of the planet can explain: how does the animal look like? Is it big or small? Nothing is known of it but everybody says that it is not to be hunted.

However, Duncan begins hunting: "*Let me trail it. The creature I'll find where the traces will end will prove Zita.* **Once we'll see it** *I'll learn what it is like* (bold emphasis added—L.Sh.)."*

The hunting was going on for three days. Twice Duncan shot and hit Zita but where he had expected to find a dead carcass he was revealing only strange flocks of hair. And another incredible thing: very rapidly Duncan felt himself a hunting object. And as days were going on, Zita's methods of hunting him were getting more and more refined: it shot him from a hand-made bow, dropped a stone avalanche from the precipice of a mountain on him, dug out a very complicated pitfall, began to talk to him.

* Henceforth the reverse translation from the Simak's Russian translation is given, not original text, because of the latter being unavailable—trans.

Ultimately, when they had met one another, Duncan saw that *"Zita behaved itself in a strange manner: it was breaking up into its constituents, divided into thousands of living pieces. There were small babblers, miniature donovans, birds-sawyers among them... and miniature copies of grown-up men..."*—that is, inhabitants of the planet Layard. Now that is what the mysterious Zita proved to be! *"Such as Zita were mothers of everything. More than mothers. Zita was both a father and a mother, an incubator, a teacher, and perhaps performed many more roles simultaneously. ...And this all leads to all-planet oneness... Here everybody and everything are relatives to each other."*

Thus the great idea of life oneness and unification of all living beings comes to us in the image of Zita.

In art creativity, creation of an image is aimed at embodying the main author's idea. And, for such a genre as science-fiction, the fresher the way an author realise his idea and the further it exceeds the bounds of reality, the further it penetrates into reality.

THE TASK:

After you have created your image of an unknown word, create a new image of the same or another word from another sphere.

The image of an unknown word is a task of an open type; it has no analogue in real life. This task is used as a model for imagination training, since processes of searching for and formulating the meaning of an unknown word are similar to operations of imaginative thinking. The aim of the training is to actualise such notions as *thinking flexibility (the extent of responses' variety, the ability to reject the selected strategy and apply different approaches); fluency (quantity of responses); freshness (the quantity of non-standard responses and the extent of their non-standardness), and also thoroughness of innovation, i.e., the quantity of details an image was enriched.*

The results of analysing works of trainees have demonstrated that, regardless of which sound complex had been chosen, the communication of meaning to it (semantisation of an object) produce the following thematic clusters:

—common life (objects, cookery, medicines);

—nature (objects, phenomena, animals);

—geographical objects (settlement sites, countries, planets);

—technical objects;

—people and their social functions;

—state (emotional, physical);

—fantastic characters and objects that reflect the whole range of real characters and objects.

Example:

GOOPHORCAMP.

1. *This is a beautiful antique vase which survived miraculously and was found during excavations of a demolished ancient city. The vase has an amazing shape, two delicate handles, and mythological images. Perhaps this is a work of a Greek craftsman, and, although the craftsman had gone long ago, his hand did preserve for us a piece of the Ancient world's culture. It is also probable that the vase came from another planet as a message of existence of other civilisations, as a message that is of greatest concern for humankind.*

2. *This is a vertical cave consisting of three wells. The depth of the first and largest one is 80 metres. The cave has many sections with transparent and deep underground lakes. The sections are linked between each other with hardly passable siphons. The water, falling in drops from the walls, have decorated the sections with stalagmites and stalactites. The drops are resonantly echoed in the cave. The cave looks severe and at the same time majestic. Hence its name—Goophorcamp.*

3. *This is a storm obliterating everything. The heavy rain falls onto the earth, and the hurricane wind blows off houses and trees. Flood comes through towns and villages.*

4. *This is a device for compact packing shoe polish.*

5. *This is the king of the country **Goophorcampia** whereof inhabitants love their strict master because he plays music on the **gold goophorka**—something similar to the saxophone. When the king begins to play, a small attractive being jumps out of the gold goophorka, and the whole country turns into a single dancing show.*

6. *The planet Goophorcamp belongs to a system consisting of three stars. It has three orbits that are constantly altermting each other; it has crystalline atmosphere and jelly-like grey soil. Southwards there appear mountain ridges of brown colour. Its plants are cone-shaped and jumping from site to site. When the orbits alternate each other, storms rise and blow off plants ' cones which are scattered all over the planet. Other forms of life are absent on the planet.*

2.6. The image of an object

Small children can perform this exercise by answering the same questions as those for the image of a character. For example, offer each child to tell

about a tea-pot, a plate, etc., about problems these objects can have, about relations they keep with their neighbours, owners, an so on.

2.7. An object with new qualities

To perform this exercise, use best of all the method of focal objects, which was mentioned in section 1.5 The strategies of creative search. The method allows to produce an unusual combination of features of an object, to provide it with new qualities.

Take note of an object you want to change, for instance, **bottle**, and provide it with characteristic features of random objects: **bee, cat, house**. Objects are to be called by different participants of the play or taken from any book opened at random.

After objects were chosen, notice their inherent features.

Bee: *hard-labouring, gathering, periodically giving itself up, buzzing...*

Cat: *flexible, fluffy, sharp-clawed, purring...*

House: *consisting of sections, of many flats, painted with different colours...*

These features should be consequently communicated to **bottle**, providing it with new auxiliary functions.

Bee-bottle has to work all the time (i.e., not to be empty), to fill itself (from every flower), then to give its filling by portions, perhaps to make some noise... It resembles very much the mixer—a device for making cocktails... Or street slot-machine for soft drinks.

Cat-bottle: flexible (all the time changes its shape and therefore does not take superfluous space). The soft bottle... The bottle-pillow, air-cushion, hot-water bottle... Sharp-clawed—it means that it can catch on or be suspended from something. And what about suckers? In this case it will keep itself at the ceiling. It would be very useful for astronauts. Purring. The emptier a bottle, the higher will be the sound of a gas or liquid going out from the bottle. “Alarm! I’m getting empty!” This will be very useful for gas-welders.

Bottle-house, blocks of sections with common walls. A lift, and you may go out at any level... The main bottle with fizzy water, and around are the floors with syrups. Some apple syrup if you please, or raspberry one. Or the both.

Try to imagine a generalised version of these ideas, such a splendid combine—the product of up-to-date technology. It can be complemented with a boiler, a refrigerator, electronic control, and a mechanical arm which

would give you the prepared on a platter with a blue border and tell you tenderly: “Eat, small baby, as you please!”

To offer this task to children of preschool age, prepare some pictures with the objects that will serve both as an object to be changed and as random objects **[29].**

2.8. Questions, questions...

‘You are old,' said the youth, ‘one would hardly suppose That
your eye was as steady as ever;
Yet you balanced an eel on the end of your nose— What
made you so awfully clever?’

Questions can be defined as a leading method that actualises both thinking and imagination **[38].**

So how to teach children to ask questions?

Here the systemic approach can be effective. At considering objects as systems, one can consequently, using the notion of the systemic approach, formulate questions that reflect not only features and signs of an object but also its links to the surroundings.

Questions can be associated:

1. **With a function of an object.**

The functional principle of analysis of fiction was offered by V.Ya. Propp in his investigation of folk tales structures [39].

When considering images as systems, a function of an image as a character will be understood as a role performed by this image and its concrete actions.

2. **With possible supersystems.**

Supersystems for our object are all outer objects which our object enters and influences. As regards fiction, these are the description of a geographical site where an object is located, a house where the action takes place, natural and social settings, etc.

3. **With subsystems of an object.**

The features of an object can be considered together with its subsystems, i.e., the parts it consists of.

As for an object, these are traits of character, habits, and other features characterizing a personage and its state.

Children usually "catch" this "key" easily and comprehend quickly where they should "search for" questions.

Examples of possible questions for the exercise **The image of a character:**

For the notion **function**: *what is this character intended for? what is it able to do? what sound does it have as its friend? what role can it perform additionally? what does it like to do? does it like to be naughty?*

For the notion **supersystem:** *what is its address? where does it live? what characters does it have as its friends? where does it like to be? what are the words that include it? how does it change depending on where it is located? what are the objects that resemble it?*

For the notion **subsystem**: *is it jolly or sorrowful? what clothes does it like to wear? what is the point of its resemblance to other characters?* and so on.

The principle of systematising questions can be used in performing any task and realising a teaching topic.

2.9. The trace-tale

How doth the little crocodile Improve his shining tail, And pours the waters of the Nile On every golden scale! How cheerfully he seems to grin, How neatly spreads his claws, And welcomes little fishes in With gently smiling jaws!
[40].

The tasks intended for creation of images can be an intermediate stage for other, more complicated tasks. Those who are seriously interested in developing imagination and methods of their stimulation are certainly aware of that remarkable task of Janny Rodary from his book *The grammar of fantasy* [41], without which the idea of the present manual would not appear.

The essence of the task is in the following: to begin with, a certain popular tale is reduced to a simple pattern; then this abstract pattern should

be interpreted in a fresh way, and abstract symbols are to be "clothed" with new images.

Example:

A certain *A* put into *B* something C. Thereafter *B* changed its relationships with C. Because of it, *A* could not extract *C* out from *B.* The attempts of *D, E, F,* and *G* to assist *A* had failed, and only the participation of *H* settled the problem.

You certainly recognize the tale *Turnip.* Now this is a new tale constructed according to the *Turnip* pattern:

Once upon a time there lived the Lion, the king of beasts. He always held that the most required beast is the mightiest beast. But once, while he was hunting, a little mote got into an eye of the king. And the Lion could not draw it out by himself. He called for the Fox to help him. The Fox both fanned with the tail and bathed with water—no result. Then the Fox called for the Hare. The Hare tried to take out the mote both with his ear and with his leg, but also failed. Then he called for the Squirrel. The Squirrel was jumping, fussing, peeping into the Lion's eyes, making the Lion yield tears with the help of an onion—and no result again. Then the Squirrel called for the Sparrow. The Sparrow fanned the Lion's eyes with the wing, pecked it with the beak so that nearly pecked out the eye to the king—all was in vain. And then the Sparrow called for the Ant whom the Lion did not even notice in the forest before the moment. The Ant went right in the Lion's eye, drew out the mote, doctored the eye with ant spirit—and the king of beasts could see again! He got his vision and saw the Ant who sat at Lion's nose and seemed so big!

Note: *notwithstanding that each of the appearing characters was progressively weaker, the solution of the problem exemplifies still another proof for the statement that* ***insignificance*** *is a relative notion...*

Another version of this exercise is the opposite task: to recognize the source version in a tale-calque. When the pattern of interrelations among personages is clear, this proves a feasible task. However, if you, at inventing a new story, digressed from the initial pattern and your source tale remained unrecognized, it would not make a problem. It is far more important not to recognize the source but to invent a new tale...

For elder preschool children and younger schoolchildren, a trace-tale can be patterned as pictures-symbols that would be partially images of personages and partially "functions," i.e., their deeds and actions.

For primary schoolchildren, one can, using these tasks for training, introduce a description of an image step by step. For instance, one can

describe in detail a “supersystem:” the site where a hero lives, causes that made him choose just this place for residence, the way he arranged his residence.

Alice *“came upon a neat little house, on the door of which was a bright brass plate with the name “W. Rabbit, ” engraved upon it. She went in without knocking, and hurried upstairs,... she had found her way into a tidy little room with a table in the window, and on it (as she had hoped) a fan and two or three pairs of tiny white kid gloves..."*
[40].

Chapter 3
IN THE BEGINNING WAS THE WORD...

The main creative task is to innovate...

For example: invent a story! How often is raised such a task! But what to begin with?

“ *The creative activity of imagination depends directly on richness and diversity ofprevious experience of a human because this experience exemplifies material for fantastic images*” **L.S. Vygotsky**. .

How can one activate the experience for performing the task **invent a story**?

“A stone thrown into water will produce concentric circles involving in its movement, at different distances and with different effects, a water-lilly and reed, a paper shiplet and a fisher’s float. Objects, which existed each by itself and were still and asleep, are getting as though enlivened; they are made to response, to interact between each other. The movement spreads in breadth and depth. The stone, going down, pushes water-plants apart, frightens fishes away; on reaching the bottom, it raises silt, meets objects forgotten long ago; some of them are bared; others, on the contrary, are covered with sand.

Many events take place within a shortest flash.

In the same way, a word that came into one’s mind at random spreads its waves in breadth and depth, produces the endless range of chain reactions, extracts sounds and images, associations and reminiscences, imaginations and dreams. This process is closely connected with experience and memory, with imagination and the domain of the subconscious, and is complicated by the fact that intellect is active, it permanently interferes, controls, accepts or rejects, creates or destroys.”
[41]

The J. Rodary’s image of a stone, which was thrown into water and produced interaction of objects linked previously to each other by nothing, is defined scientifically speaking as the concept of the **associative complex (field).** Associations in their essence are reciprocity of objects and phenomena as reflected in human conscience; they are material for thinking process as source of additional information. The especial value of associations is connected with that creative activity is always characterized by lack of source information. Additional information is not only to be

searched for in creative process but also created, for instance, by **generating, combining, and estimating associations.**

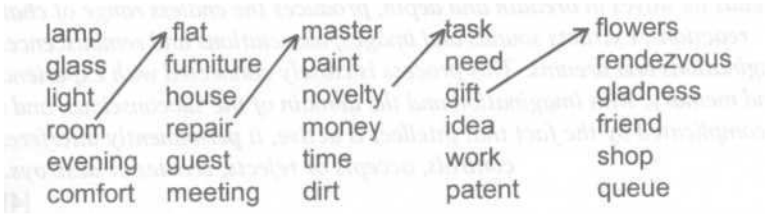
The following well-known exercises are purposed for activation of producing associations: the **chain of associations, the garland of associations [42].**

3.1. The "herring-bone" of associations

This exercise allows to activate quickly words taken from several associative fields. The exercise begins with a starting word whose function can be performed by any noun. Below the starting word one should write down in a column other nouns produced from it by random association. After 20—30 second a testee has to "switch" over to a new column: from the first column one takes a word, for example the third one, and, using it as a starting word, writes down the word derived from it by association. Then, using the second column, one should make a new switch, and this should be done 5—6 times within 2—3 minutes. Commands for switching are to be given by a teacher.

Random switches enable one to depart from the starting word and to increase the quantity of associative fields, to widen the sphere of areas which active words are taken from.

Example:
The starting word is **LAMP**.



Youngest schoolchildren can perform this task orally by answering questions asked by a teacher. The questions could be such as follow: *what words are you recalling when you hear the word* ***wind****? Maybe* ***snowflake?*** *Who or what are the friends of these words?* The same exercise can be performed as pictorial "dictation."

Example: *Who does the comb have as its friends?* "Mind!" Dasha (6 years old) answered, and for the question *Why?* she explained: "Because the mind knows how to do hair!"

The process of generating associations allows to understand better the essence of an object since it reveals associations of the object with its surroundings.

"Out of the process of speaking, the words having something in common are associated in memory in such a way that form clusters in whose inside different relations are revealed'." **(F.D. Sossiure).** That is, when a given word is being perceived, its contents is being extended to the range of words connected with it by association. For example, the word *branch* can mean a part of a tree but it can also be a *branch of science.* In this case, the associative memory proves a device which multiplies immediately the main meaning core of a word. A word can produce variety of close and remote associations. The analysis of associations consists in their classification. At considering associative complexes, we can distinguish two trends: relations according to **metonimic type** (location, contiguity) and **metaphoric** one (similarity) [43].

The analysis of associative fields from the exercise The herring-bone shows where a word "came from:"

—by contiguity (elements of super systems, parts of the system);

—by similarity (according to different features);

—by emotional significance.

Using consciously the mechanism of search for associative ties, one can set the task to control associations and perform this exercise more completely and "volumetrically."

3.2. A story with words from the "herring-bone"

"I'm getting tired of this. I vote the young lady tell us a story. " "I'm afraid I don't know one, " said A lice, rather alarmed at the proposal.

Naturally, one can add other words, too, as the **herring-bone** consists exclusively of nouns. The words from the **herring-bone** can be arranged in any sequence; one can also freely change their grammatical form. As regards genre, it can be a sketch, a detective of fantastic story, a tragedy, or any synthetic genre. One can, having acquired certain experience of writing such stories (one should remember that a story should be written within 3—5 minutes), set a purposeful task, for example to invent a tale, to the whole group. To develop speaking habits and skills of establishing associations among objects and phenomena, the task can be complicated: invent

a story based upon words from the **herring-bone** trying to use as many the words as possible.

Working with the word is an important factor of developing personality as well as emotional and conscious attitude to language.

3.3. "The binomial of fantasy"

"Tell us a story!" said the March Hare.

To perform this exercise, choose from the **herring-bone** two objects which are apart from each other along the meaning axis as far as possible and which are almost incompatible in reality **[41].**

TASK:

Invent a story using the two objects.

The task can become highly feasible if one establishes possible relationships between objects by using prepositions, conjunctions, and other grammatical means. Take for example **chicken** and **mitten** as your objects.

The versions of possible combinations will be as follow: *chicken with mitten, chicken at mitten, mitten at chicken, chicken in mitten, mitten of chicken, chicken under mitten, mitten in chicken,* and so forth.

Using one of the combinations (by your choice) as a possible heading, invent a story which would explain how could such a situation occur. Is it difficult to realise this subject? Use your experience of the previous tasks and prepare your source material: write down beforehand two columns of your associations (each of 5—7 words) with each of the two objects.

For small children these relations are better to be patterned on toys, so that children could see and verbalise them.

Read several stories aloud. All these are very different and unique. Their uniqueness will always be conditioned by connection between emotions and imaginative activity. This connection manifests itself in two ways. Firstly, images can be combined because they have common emotional tune. Secondly, and vice versa, emotional factor promotes appearance of unexpected combinations, which is also determined by life experience and emotional perception of the surrounding world. Images of fantasy provide the inner language for your feelings; they are expressive means for feelings.

When a child is creating something, the question is in a creative operation that has also aesthetic aspect; it, however, interests us from the perspective of revealing creative abilities, not of art. This creativity is impor

tant for a child itself rather than for fiction. "*It would be erroneous and unjustifiable to consider a child as a writer and to produce the same requirements to its creations as we do in respect of a writer's creation... Both play is necessary for a child itself and children's creativeness is necessary primarily for fair development of creative abilities of an author himself... In the same way, children's fiction can be stimulated and directed from outside and should be evaluated from the perspective of the objective importance that it has in development and upbringing of a child."* **[14]** That is why all these exercises should not be evaluated at the initial stage; all works should prove well and right.

The only thing, which children's attention could be drawn to and which could be compared with their creations, is the difference in approaches in creating images and plots.

Psychologists, using these exercises as creative training, can gradually introduce those requirements to stories which will correspond to the Torrance's criteria.

If, however, the stable and serious interest shaped in respect of fiction, the tutor-guide should be a specialist, as in any other kind of creative activity.

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Chapter 4 THROUGH LOGIC TOWARDS IMAGINATION

Mastering information and developing thinking actions of a student are to be interrelated; this is one of the main principles of pedagogical psychology. To comprehend any new knowledge, students have to perform independently some logical operations of juxtaposition and correlation among different elements of perceived information. In other words, teaching process have to be organized so as information would be leamt through the process of active thinking activity. Unless a student can generalise, the contents of a given piece of information will remain unmastered or learnt formally. Only true, not formal, comprehension makes man able to orient himself in the world. Another skill required in up-to-date education should be the habit of perceiving a subject not dogmatically but in its development and association with other subjects. The exercises, offered below and intended primarily to develop thinking operations and imagination, are also useful in practice of teaching different subjects as patterns that can promote elaboration of such habits.

Psychological literature has yielded a large amount of logical exercises directed to development of students' thinking. Usually, such exercises are used additionally to the main teaching programme, especially when a student is behind the rest of his group. These tasks form the following abilities: revealing different features of objects and using them in search for other objects; comparison of objects between each other by means of distinguishing common and peculiar features **[44].** We recommend collective intellectual training as the form of teaching. Such a form is considered to be most effective because of its aggregated character which provides intellectual intercourse among students. Usefulness of such exercises consists in production of multiple ideas; their shortcoming is mastering **external** results of thinking without comprehension of mechanisms they are obtained, since rules that provide organisation of thinking process are absent. Thus training becomes lacking in the most important component—realisation of the process of obtaining a result and of the methods it should be achieved. The offered below algorithm of performing a complex of exercises on the base of systemic approach method allows to introduce this component **[30,45,46].**

THE ALGORITHM OF PERFORMING
LOGICAL EXERCISES.

CONSTRUCT A COLUMN FOR EACH OBJECT AND FILL IT WITH THE FOLLOWING:

BASIC FUNCTIONS OF A SYSTEM; \

—FEATURES (ESSENTIAL AND NON-ESSENTIAL) OF A GIVEN OBJECT;

—SUBSYSTEMS (IF THEY APPEAR),'

OTHER FUNCTIONS THA T A GIVEN OBJECT C A N PERFORM B Y USING ITS FEA - TURES AND SUBSYSTEMS,'

POSSIBLE SUPERSYSTEMS.

4.1. Search for common features

The Hatter opened his eyes very wide on hearing this; but all he said was, "Why is a raven like a writing desk?"

Choose from the **herring-bone** two objects that are far apart on the semantic axis, for instance, **noodles** and **bulldozer**. Find as many common features as possible for these objects. To conduct the search for common traits not chaotically but purposefully, the author offers to use the following algorithm.

Example:

Objects: **NOODLES, BULLDOZER**.

Basic functions: **noodles**—*food product, convenience food;* **bulldozer**—*machine for removing earth.*

Noodles and **bulldozer** were invented by man and are produced industrially.

Performing the basic function is connected with heating.

Features: noodles are *made out of wheaten flour, have the appearance of thin dough ribbons,* and have *to be cooked in a liquid to perform their main function',* **bulldozer** is *made out of iron, consists of different complicated parts.*

Both **noodles** and **bulldozer** are *connected with earth',* **noodles** are made of dough, dough—of flour, flour—of grains, grains germinate from earth. Bulldozer is made of iron; iron is extracted from the bowels of the earth.

Noodles, when boiling, are *moving',* **bulldozer**, when working, is *moving,* too.

If **noodles** proves to be overdone, they *will turn into a lump-,* **bulldoze**r, when overheated, will fuse and also *turn into a lump.*

In addition, at continuous contact with water, both **noodles** and **bulldoze**r are *changing their colour* and the *ability to perform their main function.*

Subsystems (viewed as words, the objects have as their subsystems syllables and characters): both the words have an *even number of characters',* both the words *have the character L*\ (viewed as objects**) noodles** have *no subsystem,* **bulldozer** has *engine, cab, caterpillar mountings, blade, water-pump,* etc.

Noodles can be rolled up as **bulldozer**'s caterpillar.

Other functions: bulldozer: *transportation, iron stuff.*

Indirect meaning: for **noodles**—*"to hang noodles on one's ears*" (i.e., to deceive someone by means of wordy talks about nothing, by means of demagogy—cf. *"to come to the raw prawn")',* for **bulldozer**—*"he's moving like a bulldozer."*

Common features: both **noodles** and **bulldozer** *hurt our ear.*

Possible supersystems: for **noodle**s—*soup, kitchen, dining-room, demagogy;* for **bulldozer**—*complex of building machinery.*

Noodles actively hung on people's ears by the government is harmful to public mood as is hullabaloo produced by the bulldozer to the human ear.

Having exploited a bulldozer, a worker goes to eat noodles.

(Search for common features between **noodles** and **bulldozer** was carried out by students of 10th grade of Lyceum 208, Kiev.)

Such exercising contributes to more profound comprehension of objects, trains to find interrelations among them. Primary school children are searching for what objects share in their features resting upon concrete examples. Working according to the algorithm, as has been shown by practice of its application at lessons, increases considerably the quality and quantity of versions while performing an exercise. But the main effect observed at this was an increase in mastering habits of the holistic analysis.

4.2. Exclusion of a superfluous word ("the third is an odd thing out")

"No room! No room!" they cried out when they saw Alice coming.

This exercise continues the antecedent one and complicates it. Choose from the **herring-bone** three objects standing far apart along the semantic axis (for little children prepare three material objects). Find in the first and second objects those features that are absent in the third, "superfluous," one. Then combine the second and third objects into a pair and find for them those features that are absent in the first one. Thereafter combine the first and third objects having contrasted them with the second one. To achieve a purposeful result, use the aforementioned algorithm.

Example:

Objects:

1. **Cup.**
2. **Ruler.**
3. **Padlock.**

The functions of the objects and their features:

1. *A vessel for drinking with a rounded handle.*
2. *A lath for drawing straight lines and measuring space.*
3. *A metallic design of certain shape for locking something up with a key.*

Subsystems:

1. *Vessel and handle.*
2. *No subsystems.*
3. *Arch, body, mechanism.*

The possibility of performing other functions:

1. *Use of a cup fof measuring or preserving something; a cover* (when turned upside-down); *a helmet for a doll; a device for drawing circumferences.*
2. *Pointer, mixer.*
3. *Weight, hammer.*

Possible supersystems:

1. *Tableware—tea-sets and coffee-services.*
2. *Measuring, drawing articles.*
3. *Guarding systems.*

The common features for the cup and the ruler that are absent in the padlock:

—can be used for measuring;
—can be used for drawing;
—usually disposed horizontally;
—both the words have the character u;

The common features for the cup and the padlock that are absent in the ruler:

—both the words have the characters c andp;
—consist of parts;
—are three-dimensional, in contrast to the flat ruler;
—when used, are taken by the handle.

The common features for the padlock and the ruler that are absent in the cup:

—have flat surfaces;
—both the padlock and the ruler can be damaged with liquid;

—both the padlock and the ruler can be used as a hammer.

4.3. Search for analogues

"...Maybe it's always pepper that makes people hot-tempered, " she (Alice—**L.Sh**.) *went on, very much pleased at having found out a new kind of rule, "and vinegar that makes them sour—and camomile that makes them bitter—and—and barley-sugar and such things that make children sweet-tempered. "*

For a chosen object or phenomenon, Find as many analogues as possible, i. e., other objects or phenomena that share their essential features with the source object.

Exercise.

SUITCASE

The analogies based upon functions:

Write out the function of the object and write down in a row other objects that share such a function in nature, technics, or common life.

The **suitcase** is purposed for burdens hand transportation. The same function is shared by *pockets, briefcases, bags, rucksacks, sacks, hamster's cheeks, hedge-hog's quills,* or something else.

The analogies based upon features:

Suitcase's features: *rectangular, three-dimensional, firm,* etc. Rectangular. The similar feature is in *wall, book, table, TV-screen,* etc. Three-dimensional. The similar feature is in *brick, house, pot, case,* etc. The analogies based upon subsystems:

Write out in a column possible subsystems and in front of each one write down objects that share the similar subsystems.

Suitcase comprises:

—travelling cover with locks (as have *trunk, box,* and *casket*);

—handle (as have *door, cup, tram).*

4.4. Search for an opposite object

"Reeling and Writing, of course, to begin with, " the Mock Turtle replied: "and then the different branches of Arithmetic—Ambition, Distraction, Uglification, and Derision. "

Choose an object, for instance, **honey**, and find as many other objects, opposite to the chosen one, as possible.

To perform this exercise, also use the algorithm, i.e., select opposite objects according to functions, features, size, shape, physical state, subsystems, etc.

Example:

Honey is a *food product.* All inedible things are opposite.

Honey is *useful.* Opposite to it are all harmful objects such as *smoke, noxious gas, bad neighbour.*

Honey is *sweet.* Opposite to it are all bitter things: *dendelion's leaves, medicines, truth...*

Honey is usually *thick.* All liquids will be opposite: *water, milk, juice,* etc.

4.5. A system of possible causes

The Hatter was the first to break the silence. "What day of the month is it?" he said, turning to Alice: he had taken his watch of his pocket, and was looking at it uneasily, shaking it every now and then, and holding it to ear. Alice considered a little, and said, "The fourth. " "Two days wrong!" sighed the Hatter.

Describe a rather usual situation with an abrupt and unusual end. Give some explanations, right up to the most fantastic ones, to this final. At searching for reasons, use features related to a "subsystem" (an object per se, its conditions, etc.), a "supersystem" (common life, transport, etc.), other systems, and temporal resources of a system in the past or future.

Example:

I INVITED GUESTS TO MY ANNIVERSARY PARTY.
WHEN THEY'D COME, I WAS'NT AT HOME.

Among the reasons usual in such a situation *(I was delayed by my boss; when I was visiting my hairdresser, electric current was turned off; I fell down on the street and found myself in a hospital),* the following versions were offered as well:

—Guests came a wrong day.

—I'd invited guests to the anniversary party, and they came to celebrate my ordinary birthday.

—I'd changed address, and guests visited my previous residence.

—I was called by my admirer who had been in the city only for an hour.

—I made an alien's acquaintance...

—Aliens offered me their planet to be shown as a present, having promised to turn round within a second...

—I participated in pursuit of a dangerous criminal.

(A group of teachers, the city of Tyraspol').

4.6. A three-word sentence

The March Hare took the watch and looked at it gloomily: then he dipped it into his cup of tea, and looked at it again...

From the **herring-bone**, choose three words standing far apart from each other along the semantic axis. Construct as many sentences as possible with all the chosen words (using additional words and changing grammatical form of the given ones are allowable) **[44]**.

As practice has demonstrated, this very interesting exercise produces merely activating effect; it does not contribute to finding associations among objects and creating integral images, i.e, to searching for and finding out new combinations of objects.

To search purposefully for unusual relations among ordinary images, to create new integral images on the base of separate elements, to construct not only single sentences but also to create the whole stories can be provided by an algorithm based upon the analysis of works appeared as a result of training with use of the exercise.

THE ALGORITHM:

1. WRITE DOWN IN A COLUMN SUBSYSTEMS AND POSSIBLE SUPERSYSTEMS OF OBJECTS.
2. WRITE DOWN POSSIBLE FUNCTIONS FOR EACH OF THE OBJECTS. FOR LIVING OBJECTS THESE CAN BE PROFESSION OR OCCUPATION PERFORMED BY AN OBJECT OR ANY OF ITS PARTS (FOR INSTANCE, **MAN**—*FILM DIRECTOR,* **DOG** *GUARD,* **fox's TAIL**—*BROOM)*.
3. WRITE DOWN POSSIBLE VARIANTS OF OBJECT'S FEATURES AND PARTS (COLOUR, SHAPE, SUBSTANCE...).
4. POINT TO POSSIBLE EMOTIONS OF AN OBJECT (SAD, EXCITED...).
5. WRITE DOWN POSSIBLE ACTIONS WHICH CAN BE PERFORMED BY AN OBJECT (TO WAIT, TO SIT, TO OPEN...).
6. COMBINING ITEMS 1—5, CONSTRUCT SENTENCES FROM PHRASES THAT ARE OF INTEREST TO YOU.
7. COMPOSE A STORY FROM the SENTENCES.

SUCH A WORK, ALLOWS TO ACHIEVE CONSCIOUSLY A NEW LEVEL OF QUALITY, AS IT PROVIDES MATERIAL FOR THOROUGH ELABORATION AND SELECTION OF DETAILS USED BY AN AUTHOR WHILE PERFORMING HIS TASK.

Example:

PORRIDGE—STATUE—BALCONY.

Describe these objects according to the algorithm.

1. **Possible functions.**

Porridge—*a food product cooked of cereals',* metaphorically*—*medley, helter-skelter, annoying matter* ("to have eaten porridge," i.e., *to put things right), one's untrustworthiness* ("one cannot eat some porridge with him," i.e., *one won't get anywhere with him), mumbling* ("a porridge in one's mouth," i.e., *one mumbles),* etc. The main function of porridge is *to feed',* the auxiliary functions are as follow: *to define relations to other objects',* presence of different properties and conditions (according to the items 3, 4, 5) allows using mess as a *sticky substance, building material,* and so on.

Statue—*a sculptural image of a human being or an animal, usually in full height, often enlarged',* metaphorically—*immobility* ("motionless as a statue," "silent as a statue"), *coldness* ("cold as a statue"). The main function is *to preserve information of an object and to meet aesthetic requirements.*

The auxiliary functions: *stand, covering force used in military actions, symbol, reference-point,* etc.

Balcony—*a railed platform projecting from a building's wall; upper sits in the theatre.* The main function is *to enable one to go out of a flat without leaving it.* The auxiliary functions are: *place for relaxation, stand for spectators,* etc.

2. **The objects' subsystems.**

Porridge—*grains, water, butter,...*

Statue—*base, elements of the body and clothes,...*

Balcony—*ground, rails,...*

The objects' supersystems.

Mess-—*food products, kitchenware, stove,...*

Statue—*park, exhibition, marble carrier or foundry,...*

Balcony—*-floor, building, city, building area,...*

3. **The objects' features.**

Mess—*buckwheat, hot, sticky,...*

* Henceforth metaphorical meanings for the objects are given as they are in Russian idiomatic usage—**trans.**

Statue—*marble, white, bent,...*

Balcony—*open, slight, sunny,...*

4. **The objects' emotional state.**

Mess—*monotonous, tedious, burning,...*

Statue—*thoughtful, despondent, sublime,...*

Balcony—*modestly hiding, protruding, aged,...*

5. **Possible actions.**

Mess—*to puff, to burn slightly, to overflow,...*

Statue—*to have rocked, to strain itself, to break, ...*

Balcony—*to be built, to fall down, to be flooded, ...*

6. and **7**. *The opened balcony had yield such smell of boiled buckwheat that even the cold statue started. 'Now I'm standing here as a statue, supporting this impudently projecting balcony with my shoulders, '—she thought despondently,—'and nobody offers me even a spoon of the buckwheat!'*

Having stood upright, the statue grasped the balcony's rails with her hand, and her other hand reached out for the buckwheat. But the aged balcony did not bear the weight of the stone statue and crashed down together with the buckwheat. The falling balcony not only collapsed itself but also broke the statue. For a long time builders sorted out a mess of the fragments of the balcony and statue. Then a new balcony was made and adorned with fragments of the marble statue milled into a mess. As to the buckwheat, a boy shapedfrom its remains a house with a balcony and an equestrian statue of an Indian man.

Morality: *both the balcony and the statue would be safe unless the smell of the buckwheat.*

4.7. Create a story

In the previous section of the book we have offered to **construct a story out of the words of the herring-bone.** Use the aforementioned algorithm to create a scheme for a story. Choose the words which seem significant to you, and involve additional words allowing to realise your plan.

Text you are creating should also be (and has to be) considered as a system. Viewed as a linguistic object, text exemplifies a group of sentences connected through common sense and structure.

Such characteristics of text as its **discreteness, substantial integrity**, and **structural cohesiveness** are acknowledged by every researcher and allow to call it a system. Consider these concisely.

1. **Discreteness.** Text appears only provided with minimum two sentences. Therefore, text can be divided into different sentences.

2. Text exists in its **substantial integrity**, reflecting those associations and relations which appear in reality itself.

3. **Cohesiveness** of text is an essential feature close to discreteness. Cohesiveness appears with a compound object consisting of some elements **[47]**.

At analysing a text one can see that it is a combination of heterogeneous elements (sentences), intended for performing a certain function and creating by their combination a new (systemic) feature which is absent in every element the system is composed. The presence of such features enables one to call a text a system and to apply principles of the systemic (holistic) approach in constructing and analysing texts.

The holistic approach allows to foresee which elements could be used at composing stories. Practice confirms that the following typical elements are actually distinguished and described:

—description of a place;

—characterisation of a personage or an object;

—dynamics of action;

—state (of nature, settings, subjects);

—changes in state, the transition from state to action;

—the subjective and evaluating perception of reality **[48]**.

4.8. Defining notions

"Speak English!" said the Eaglet. "I don't know the meaning of half those long words, and what is more, I don't believe you do either!'

This exercise includes the whole complex of logical operations. At searching for a definition, we are laying bare the contents of a notion, i.e., we are pointing to **what** this notion designates and **which** features are common for the objects integrated by the notion. Thus, a definition should, firstly, discover the essence of objects and, secondly, differ a given object from the rest.

Therefore, to define any notion we have to find a more general notion (a supersystem, a generic notion) that would include the given one; we also must find those essential features which would be inherent in eve

ry object defined through the given notion and would not be presented in others entering the supersystem (or gender).

The complexity of the task is determined primarily by diversity and polysemantic character of notions. Notions can define natural objects and phenomena, artefacts, intellectual products, social relationships, and so forth.

One can classify notions according to different features. Here **specific** and **abstract** notions are of interest to us.

The first consist of:

—natural living objects: a hare, a tree, a lady-bird;

—natural inorganic objects: a mountain, a river, a cave;

—natural phenomena: wind, thunderstorm, flood;

—artefacts: a plate, a car, a house.

The abstract notions include:

—intellectual products: physics, psychology;

—complicated polysemantic notions—creativity, personality, conscience. The definitions of notions related to nature are given in manuals on biology, geography, and botany. As a rule, one meet an obstacle at trying to define artefacts, especially those used in common life and polysemantic ones.

DEFINING ARTEFACTS

This rather difficult task is quite easily coped with when one applies in performing it some elements of the holistic approach. To define an artefact, use the following

ALGORITHM:

1. DEFINE A SUPERSYSTEM THAT INCLUDES THE OBJECT.
2. DISTINGUISH THE FUNCTIONS THE OBJECT PERFORMS AND THOSE ESSENTIAL FEATURES WHICH DIFFER IT FROM OTHER OBJECTS OF THE SUPERSYSTEM.

THERE CAN BE SUCH ESSENTIAL FEATURES AS:

—SHAPE;

PARTS AN OBJECT CONSISTS OF;

—SIZE;

OCCASIONALLY THE SUBSTANCE AN OBJECT ARE MADE OF CAN BE OF SOME IMPORTANCE.

TO OBTAIN A LACONIC DEFINITION, YOU CAN REORDER WORDS IN THE LAST VERSION OF YOUR DEFINITION.

For example, **vessel:** a *container for liquid and dry substances.*

The notion **vessel** is a "supersystem" for the notions **pot, cauldron, kettle, glass, cup, etc.**

Pot is a *rounded earthen vesselfor preserving and preparing food* (among essential features, the material has been mentioned as pots historically were made of clay).

Cauldron is a *large metallic rounded vesselfor preparing food* (among essential features, size and shape are important as size distinguishes the cauldron from the kettle).

Kettle is a *small metallic vessel for boiling food on fire.*

Knife is an *implement for cutting that consists of a blade and a handle* (essential features that distinguishes it among other implements are subsystems that constitute it).

Herring-dish is an *item of tableware having elliptic shape and intended for herring* (the essential feature consists in its shape).

The above algorithm can be used in another type of the task wherein one needs to render not a laconic and clear definition of an object but its developed description, especially for small children. In such a case, the

ALGORITHM

may be as follow:

TO DESCRIBE THE OBJECT, TELL ME:

— *WHA T IS IT MADE FOR?*

WHA T IS IT MA DE OF?

— *WHA T SHAPE (OR PARTS) DOES IT HA VE?*

— *WHA T SIZE AND COLOUR IS IT?*

One can also solve another task: to recognise which objects are meant in the description. To make the task more difficult, the function of an object is not to be described.

4.9. Defining polysemantic notions

The social experience of every man is unique and determines individual comprehension of notions having no unambiguous definition. This experience manifests itself in "active" language of personality. To explicate the meaning of complicated notions involving the whole body of participants, we offer

THE ALGORITHM FOR DEFINING ABSTRACT NOTIONS

1. WRITE DOWN THE NOTION TO BE DEFINED.
2. WRITE DOWN IN A COLUMN NOUNS APPEARING ACCORDING TO THE PRINCIPLE OF FREE ASSOCIATIONS WITH THE NOTION BEING DEFINED (USUALLY BY TIME, 2 TO 3 MINUTES).

3. From the list obtained, choose 2—3 words that, in your opinion, CORRESPOND BEST OF ALL TO THE NOTION BEING DEFINED.

4. Using nouns chosen as key words, define the notion. In time of NEED USE GENERIC RELATIONSHIPS AMONG THE NOTIONS.

5. DISCUSS SEVERAL DEFINITIONS ELABORATED BY OTHER STUDENTS, DRAWING ATTENTION TOWARDS ESSENTIAL AND NON-ESSENTIAL FEATURES OF THE NOTION.

6. Resting upon the discussed definitions, synthesise the generalised DEFINITION OF ГНЕ NOTION **[49]**.

Consider the word of the algorithm on the example of defining such polysemantic notions as **thinking** and **culture**, and then create such a synthesised definition as **culture of thinking**.

A.

1. Thinking.

2. Problem.

Logic.

Question.

Intuition.

Rules.

Success.

Self-dependence.

Erudition.

Solution.

3. Problem.

Self-dependence.

Solution.

(Substantiation of choice: *thinking is required to solve a problem; thinking ought to be independent, autonomous: thinking process has no result without solution.*

4. **Thinking** is *the process of autonomous solving a problem.*

B.

1. Culture.

2. Art.

Upbringing.

Erudition.

Politeness.

Education.

Beauty.

Skill.

Literacy.

Speech.

Benevolence.

3. Upbringing.

Skill.

Beauty.

(Substantiation of choice: *culture does not appear by itself, it requires upbringing; upbringing ought to carry a man to a certain level—needs to be able; doing something must contain the sensation of beauty as an ideal to strive.)*

4. **Culture** is *the result of purposeful actions intended to achieve a certain level of skill and the sensation of this level's beauty.*

One of synthesised definitions:

Culture of thinking is *thinking by certain rules and the ability to manage thinking process to achieve the most effective solution of a problem and the sensation of the beauty of solving it.*

(Students of 10th grade, Lyceum 208, Kiev. March 1994)

4.10. Verbalising a thought in other words

Choose a phrase of which complexity and contents are determined by the age of participants and the aim the task is used for (KVN, the lesson on fiction or logic). Offer several versions of verbalising a single phrase in other words. It would be better if the words in both of the versions would not coincide. It is also necessary that the idea of the proposition would not be perverted.

Example:

I AM ALWAYS SURE THAT I AM RIGHT.

In other words:

—I will never agree with opponents' arguments.

—I am always arguing till I win.

—Nobody can persuade me that opposite concept is right.

—I want to be considered right.

—I think that, while I am getting the final word, everyone reckons me a mighty person.

And so on.

This exercise can be considered as a constituent of the **exercise Create a story.**

4.11. Applying analogies for generating ideas

If technical problems are settled by a stable group of specialists in different kinds of activity with use of a range of analogies, the result would be the method of generating ideas titled synectics (Greek: *unification of heterogeneous elements).* William Gordon, the author of the synectics method, changed many occupations before he became a supervisor of a group of inventors. He noticed that specialists in different professions understand a task in different ways, from the perspective of their occupations.

Suppose that one needs to keep for a while the properties of an object. "Arrest him!" a policeman says; "Put it in the refrigerator," a cook says; "preserve," "defend," "perpetuate," and so forth—an engineer, a military man, a sculptor.

As one has seen, merely change in formulation of a task according to semantic meaning produces different associations with those branches of knowledge which are familiar to a given specialist.

To Gordon, any creative process requires the ability to turn the usual into the unusual and vice versa. People get the inheritance of frozen words and comprehension methods which communicate accustomed and usual shape to reality, but it is this inheritance that is to be rejected while solving creative tasks.

The peculiarities of the method that reflect **analogising** as thinking strategy have been considered in section **1.5.** This section concerns the potentials of synectics as a way of generating ideas.

Best of all the task of "melting words and ways of comprehension" is performed by the third method—**symbolic analogy (SA).** To obtain SA, W. Gordon offers to find a phrase of two words, usually an adjective and a noun, which would laconically and paradoxically, or metaphorically, characterize the essence of a task or an object. For example, **marble** is "*rainbow-coloured perpetuity,*" **atomic nucleus** is "*energetical insignificance."*

The elder brother of SA can be called **oxymoron**—a stylistic device related to a single object and consisted in paradoxical unification of notions. Such paradoxical constructions are very common in non-formal texts and possess a surprising peculiarity—they phrase a thought so deeply, brightly, and expressively that it is difficult to find more effective version of its verbalisation. One may remember titles of the well-known creations—*Living corpse, Optimistic tragedy, Hot snow,* etc.

However, neither W. Gordon himself nor other inventors of technical creativity methods offered either rules or creative methods for SA or oxymoron.

Reasoning from the definition that a paradox is an attestation or denial of a single notion (object, phenomenon, condition, or feature) possessing variety of essential features, one can offer the following

ALGORITHM FOR CONSTRUCTING SA OR OXYMORON

1. Choose a notion and characterize it briefly.
2. Determine its essential features (there can be both its functions AND principles of operation, workings), write down them in a column.
3. Find the antonyms (notions with opposite meanings; for some features these can be antisystems, i.e., the objects performing opposite actions) to the essential features.
4. Find the antonyms that, coupled with the chosen notion itself, could produce a paradoxical construction.
5. From the obtained list of pairs of words with opposite meanings, choose those phrases which yield an aesthetic and paradoxical definition for the notion chosen.
6. Create by means of selection of versions several combinations of essential features and antonyms, and find objects that could be defined in these words. Using the chain of associations, find several brilliant metaphors for the notion selected, its essential features, and their antonyms **[50].**

Apply the algorithm for creating a symbolic analogy or oxymoron.

Example.

WATER

1. **Brief characteristic.**

Water preserves the life on the Earth; from water living beings had appeared on land. Water performs a continuous round in nature falling in rain and rising by evaporating from the surface. When freezing, water expands and produces great 'effort.

2. **Substantial features.**	**3. Antonyms.**
Preserving the life.	*Annihilating the life (antisubstance).*
Evaporating.	*Yielding to condensation.*
Liquid.	*Solid.*
Freezing at 0 C°.	
Transparent.	
No taste.	

No smell.	*Defying freezing, or freezing at +100 0 C°.*
Moist.	*Turbid (impenetrable of light).*

4. Reasoning from the **function of antisubstance,** one can remember the "*dead water*" well-known from fairy tales. The **solid water** is also known—this is *ice.* And the **dry water**—a *crystalline powder turning into water at certain temperature*—was discovered but recently; such water is very comfortable for preservation and transportation. The notion of **aromatic, tasty** water finds many reflections in reality.

5. **Solid liquid**—this is how one can define the ability to defy compressing—is very broadly exploited in technics.

Transparent impenetrability—this notion can be embodied in *polarised glass* which light penetrates through only in one direction; in the *trap for light* in which rays of light are reflected from inner surface till getting in a proper point; and even in a *mirror* in which you see yourself as if from "the beyond side."

6. **Liquid smell** (don't confuse with **smelling water!**) can be a *deodorant, insect poison,* or other aerosol in spray cans.

Solid smell can be *naphthalene* and other substances which are evaporating without transition into the liquid condition. The *"solid antismell"*—a filter, or smell absorber—is also creatable.

Tasty ice is certainly *ice-cream.*

7. The substance that is necessary to preserve the life on the Earth is circulating. It circulates like blood in the human organism. **Water is the blood of the Earth.**

Living creatures had appeared in water. Therefore, **water is the mother of the life.**

Rain is the tears of heavens.

TRIANGLE

1. *This is a closed part of a flatness restrictedfrom three sides and having three angles. It is also the minimal geometric figure: any polygon can be considered as a combination of triangles.*

2.	*3.*
Has three sides.	*One side, many sides.*
Has three angles.	*One angle, many angles.*
The sum of its angles	*The sum of angles equals*
is 180 degrees.	*either 0 degrees or infinity.*
A flat figure.	*A three-dimensional figure.*
A closed figure.	*An opened figure.*

4.

The one-sided triangle—the *triangular edge,* such as that of a polished precious stone, or the *projection of a triangular prism or pyramid onto the base flatness.*

The one-angled triangle-- thus the *sight angle* (from eyes towards horizon) could be called.

The three-dimensional triangle—a *triangular prism* or *pyramid.*

The open triangle—the situation where *he* and *she* remain and a *third* person leaves out.

5.

One-angled triangularity -an *arrow-* or *spearhead.*

Polygonal triangularity—a *whirligig wheel.*

Flat three-dimensionness—*a drawing, a figure, a picture, a photo.*

6.

Zero triangularity—this is a *straight line.*

Zero flatnessness (threesidedness)—this is a *point.*

7.

Any polygon can be considered a collective of triangles. Accordingly, each triangle can be considered a member of a collective, of a family, or a polygon's child.

Minipolygon.

Basic minimality consists in the fact that every polygon can be studied by dividing them into triangles.

GENE

1. A unit of transmission of genetic information, its certain feature. The gene is the part of the chromosome.

2-	3.
Unit of preserving and trans-	*Lack of size,*
mission of genetic information.	
The bearer ofa feature.	*Lack of personality.*
Unique.	*Serial.*

4. *Serial gene.*

5.

Sizeless unit.

Unique seriality.

Serial uniqueness.

6.

Individual seriality.

Unique lack of size.

Unit without personality.

Serial unit.

7.

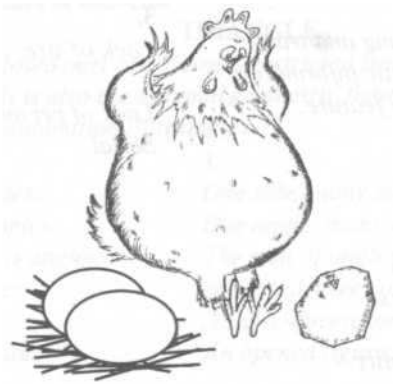
To the main definition, the **gene** is a unit of heredity. Given that genes are transmitted periodically, from parents to children, it can be called **discrete continuity**. Hence, by association of ideas, the notions about the genealogical tree, generations, etc.

The term **serial** produces the association of a technological process, potentiality of improvement—*genetic engineering.*

Another metaphor—*encoded life.*

For the notions which are defined through the only feature or which have several features eminent for perception, work with the algorithm is limited to selection of antonyms for a given notion, e.g.: *sweet bitterness, wise stupidity, married bachelor, rich poverty, kind malice, ice fire, friendly enemy, bitter honey, dumb speech, false truth, sorrowful joy, heartless feelings.*

The algorithm is the methodological supersystem for exercises on development of logical thinking. It can be considered as a complex of logical exercises which comprises as its constituents many of the aforementioned logical exercises. Work with notions according to the algorithm promotes more profound understanding and consideration of them, allows to establish their new interrelations with other objects, helps to see the unusual in the usual and to define the notion creatively.



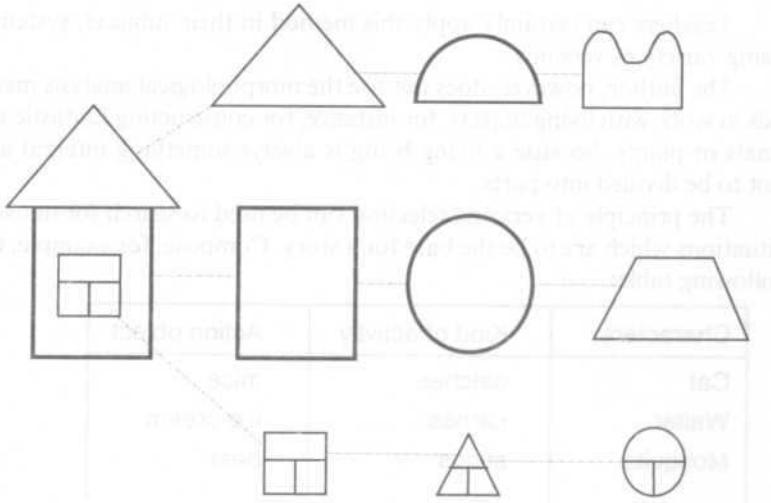
Chapter 5 **COMBINING AS THE BASICS OF THE LOGIC OF IMAGINATION**

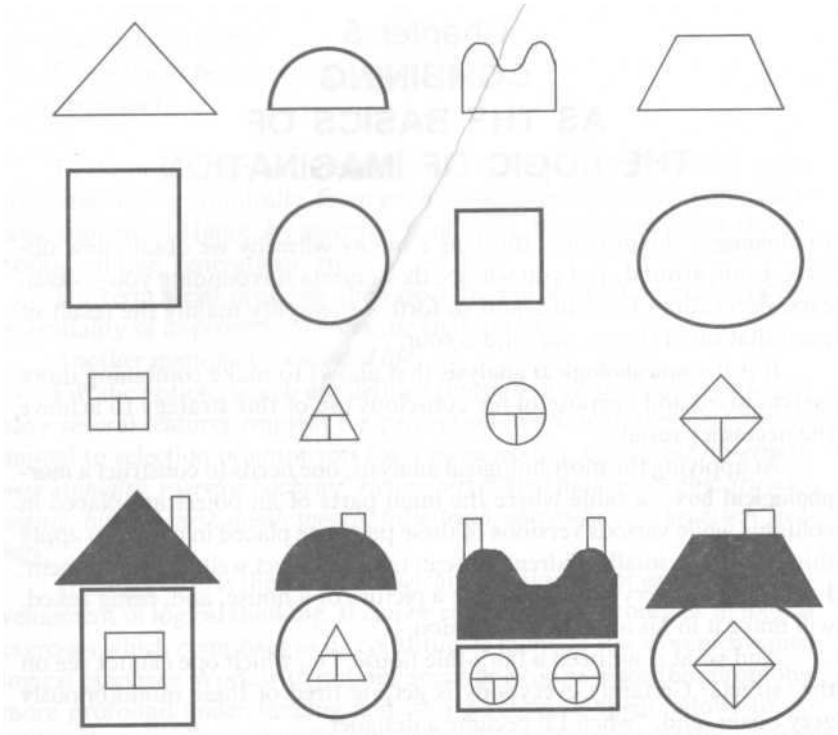
Combining is the principal thinking strategy whereby we obtain new objects. Look around, and you will see that objects surrounding you—vases, cars, decoration, furniture, and so forth—exemplify mainly the result of combination of shape, size, and colour.

It is the **morphological analysis** that allows to make combining more systematised and puiposeful for conscious use of this strategy to achieve the necessary result.

At applying the morphological analysis, one needs to construct a **morphological box**—a table where the main parts of an object are placed in columns while various versions of these parts are placed in rows. To apply this method to small children, one can take an object well-known to them. For example, everybody can make a picture of a house, and, being asked, will make it in his accustomed version.

And what if we need a fairy-tale house, i.e., which one cannot see on the streets? Certainly everybody is getting tired of these monotonously grey boxes, and, “when I’ll became a designer...”





Teachers can certainly apply this method in their subjects, systematising variety of versions.

The author, however, does not use the morphological analysis methods in work with living objects, for instance, for constructing fantastic animals or plants, because a living being is always something integral and not to be divided into parts.

The principle of versions selection can be used to search for unusual situations which are to be the base for a story. Compose, for example, the following table:

Characters	Kind of activity	Action object
Cat	catches	mice
Waiter	carries	ice-cream
Mosquito	stings	bear

Then sort the versions subsequently:

Cat catches ice-cream.

Cat catches bear.

Waiter catches mouse.

Waiter bites bear.

Mosquito carries bear.

Mosquito stings ice-cream.

You may write down in the columns (they are otherwise called axes) whatever you want; the quantity of rows in the columns is not limited.

After words combining choose the combinations or a group of those which would serve as a stimulus for creating a story to explain how and why such a situation occurred.

Chapter 6 **METAPHOR AS AN INTEGRATIVE INDICATOR OF CREATIVITY**

Metaphor is a distinctive indication of genius, for the ability to create a new metaphor is the ability to recognize similarity.
Aristotle

The mystery of metaphor

Metaphor have in last decades arrested close attention of linguists, psychologists, philosophers, ayd specialists in other fields of knowledge. The wave of this interest rose as of the 70s, when perception of metaphor as an instrument of imaginative speech was displaced with comprehension of its poiyfunctional and multiperspective nature.

What is the secret of popularity of that "*youthful antiquity*," that *"specialized universality*"?

Linguists have revealed that this "poetic beauty" having the ancient mythological origin is a tireless hard-worker in the field of fundamental mechanisms of linguistic creativity, which provide involving new objects into the cultural and linguistic context, developing notions for them, and revealing their essential properties.

Investigators in culture have found out that metaphor is a cultural phenomenon, so that it is impossible to understand cultural development without metaphor; besides, they have come up against the problem: *is it culture that creates metaphor, or vice versa?*

Researchers have come to the conclusion that metaphors are patterns whereby natural laws are learnt and described: "a theoretical science is in its basis the regulated use of metaphor**" (A. Rappaport [11]).**

Philosophers have detected that metaphor is a "philosopher" determining the mode of world perception and comprehension, i.e., the mode of cognition of the world and man in the world. Metaphor, as means of thinking about the world with use of the knowledge already acquired, reflects thus the historical development of culture. As constructing metaphors and comprehension of them are determined by the whole culture, as cultural changes determine not only change of metaphors but also a ratio of "logical" and "non-logical" components.

The interest of psychologists regarding metaphor is focused primarily to problems of interrelations between thinking and language, imaginative and logic. Metaphor is also important in cognitive processes, since the human world is represented both with the world of things and with "ideal" objects—feelings, thoughts, concepts. In speaking of the ideal world, the problem arises how to designate and expose its content, because to tell about the unknown is possible only by comparing it with something familiar, known.

The problem is based upon the contradiction: an ideal object ought to be material so as it could be perceived and reflected in the conscience (through sensations), but, on the other hand, it cannot be material since it is a result of psychic processes.

The analysis of metaphor as a system will be conducted below, and it will be shown that metaphor is the linguistic construction solving this contradiction.

4.1. The logic of metaphor

The basic function of metaphor (Greek *metaphora* for *extrapolation, extension)* is the use of a word denoting a certain object (phenomenon, action, feature, sign) for **figurative** definition of other object which is somewhat **similar** to the former. This is as if imaginative definition through other object, indirect or hidden extrapolation of a property, or comparison **[**51**]**.

As is obvious from the definition, metaphor is based upon **comparison**—one of the main logical methods of exterior world cognition. "Cognition of any obj ect or phenomenon begins with our distinguishing it among all other objects and establishing its similarity to related objects" **[52]**. As far back as Aristotle wrote about dualism of comparison and its still more complicated form—metaphor: there are two types of comparisons; one concerns style, being a method adorning speech, another is related to proof **[53].**

The logical operation **analogy** exceeds the bounds of direct comparison and is based upon the assumption that as two or more objects correspond to each other in some aspects, as they probably will correspond in other aspects. Analogising as a form of thinking is one of the main strategies in solving creative tasks. Analogy lies in the foundation of hypotheses for carrying out experiments as well as of their creative substantiation in scientific-research practice. Applied in innovation activities, analogy allows, resting upon available decisions, to borrow, improve, and apply them

to new technologies and mechanisms. As noted above, to provide a purposeful and more effective search for manifold analogies, the methods based upon conscious use of analogising strategy have already been elaborated in technical creativity.

Fictional creativeness also produces comparison for cognition, but the especial cognition, emotional one, cognition in the process of which an author participates and expresses his attitude to an object or phenomenon. Comparison here is an imaginative idiom where one object (feature, sign, etc.) is juxtaposed to another one having any feature in somewhat greater extent.

B. V. Tomashevsky distinguishes three elements in a comparison:

1. *What is compared, that is "object; "*
2. *What an object is compared to, that is "image; "*
3. *The basis one object is compared to another, that is "feature"* **[54].**

In addition, in imaginative speech the whole structure of a comparison serves to **strengthen** a feature: "*His face... would seem languidly pellucid but for the eyes, grey like sand, and shining as pure steel, with the forceful and confident look*" **[55].** In the imaginative phrase *"eyes grey like sand,"* **eyes** are "object," **sand** is "image," and a real common feature that makes the two notions similar is the **grey colour** of the object and the image. A comparison can be complicated, detailed, expanded, ramified, i.e., be a **comparison-image**:

> *"It was the colour that Grey was searching for: utterly clear like a scarlet morning stream, abounding with gentle joy and regal nature. There were in the colour no mixed tints of fire, no poppy-petal, no play of violet and lilac tints; there also were neither tints of blue nor shade; there were nothing provoking doubts. It glowed like a smile with enchantment of spiritual reflection"* **[55]**.

4.2. Functions of metaphor

The function of metaphor as an imaginative tool is, in contrast to comparison, not only to strengthen a feature but also to create a new image, to produce an association in imagination.

Another function is also inherent in metaphor: applied in linguistics, metaphor creates new designations for objects, new meaning, as distinct from Fiction where metaphor serves to create verbal images, imagery of fictional speech.

The development of new sciences and industries have provoked a need in new words and terms. Performing the function of designation in the process of linguistic creativeness, metaphor functions as **direct analogy**—it denotes objects of different spheres of reality by searching for similar features or processes available in other objects or phenomena. However, in contrast to the logical operation **analogy,** metaphor provokes imaginative ideas, which allows to define it **as imaginative analogy**.

It is the act of revealing common aspects in objects being compared that is the act of producing a metaphor. It manifests itself by means of extrapolation of a feature of one object to another one because of the presence of a similar feature in both objects. Denoting figuratively one's life as a head *("it will cost him his head"),* we mean that a man cannot live with his head cut off or alike. The similar meaning was also given to the part of a tape recorder *(magnetic head),* to the title at the top of a piece of writing *(heading),* to any ruler or leader, etc.

Linguists have revealed the following **thematic clusters of metaphors**:

1. *The geomorphic metaphor.*
2. *The anthropomorphic metaphor.*
3. *The "intellectual" metaphor.*
4. *The transportation metaphor.*
5. *The zoomorphic metaphor.*
6. *The "cookery"metaphor.*
7. *The "common life"metaphor.*

Thus, the function of metaphor have evolved from considering it to be the verbal equivalent of an image to conscious understanding of complicated character of relations between its imaginative and semantic components, "from the instrument of creating images to the method of forming meanings that are absent in language and have different degree of complexity" **[56].**

The functions of metaphor are rather completely described in the theory of literature and linguistics. One can recall the following:

1. The **nominative (denoting)** function. It is the universal mechanism of semantic shifts that provides involving new objects into cultural and linguistic context (finding the name for a new object, for example Earth *satellite,* computer *mouse).*

2. The **cognitive** function, i.e., setting forth essential properties of an object, formation of a new notion, establishment of new semantic contents for human knowledge. "Metaphors-patterns" serve as means of cognition of complex nature objects (the planet model of the atom, the structure of the membrane).

The essence of the cognitive metaphor as a special thinking method is the establishment of new semantic contents for human knowledge. Viewed from the perspective of psychology, metaphor enables one to provide comprehension as complicated psychic process including both thinking and the sphere of emotions and feelings as well as intuition.

3. The **estimating** function ("keen vision"). "It was the sounds of your simple, wise voice that I was lacking in. This is like cold water" [55].

4. The **emotive-estimating** function: *"Lexica, with his mouth opened, looked at Grey's occupations with such a surprise as lone perhaps looked at the mouth of his furnished whale*" [55].

5. The **poetic** function: *trope* [57, 58,59].

6. The "**constructor's**" function: constructing new meanings.

From the list above one can see that thinking has to make recourse primarily to metaphor when there are no available means for typical solution of a rising problem, i.e., when an available answer is absent. The process of constructing a metaphor always suggests a certain problematic cognitive-designative situation with many variable factors; therefore the creation of a metaphor is the task without any available answer, which affords grounds to reckon it creative.

6.3. The mechanism of constructing metaphor

To understand a metaphor means to trail in one's mind the way it was created. However, variety of factors takes part in creation of a metaphor; they ultimately turn metaphor into individual creative process.

The comparison of incomparable

The basic mechanism for creation of a metaphor is the establishment of resemblance among different realities: *"Grey went out. From then on he abandoned himself to the feeling of amazing discoveries, the feeling akin to a spark in the Bertold's gunpowder mortar,—one of those spiritual landslides from under which is shooting up the sparkling fire"* [55].

So it is the act of revealing common aspects in objects being compared that is an act of creating a metaphor per se. It expresses itself in extrapolation of a certain object's feature to another object because of the similar feature's being in the latter. However, in contrast to analogising, metaphor suggests semantic context and is determined by psychological motives.

Metaphor proves to be a more developed tool as compared to the logic of classifying and describing phenomena of reality: *"Everything was asleep on the girl: her dark hairs, her dress, and the dress's pleats; even the grass near her body as if slightly dreamed out of sympathy to her. When the impression had become complete, Grey entered its warm and washing wave and swam in it away"* **[55]**.

The possible impossibility

In addition, metaphor is impossible without the assumption that the similarity of things unjuxtaposable in reality does exist. Remember the conversation between Assol and the coal-miner:

" *'When a fisher is at his pursuit, he thinks he will catch a LARGE fish seen never before. ' 'Well, and what about me?' 'And you,' she laughed, 'you perhaps think that the basket you fill with coal will flower. 'And immediately something drove me to look at the basket, and it seemed to me that the basket 's twigs were getting covered with buds; then the buds burst, leaves splashed along the basket and disappeared"* [55].

Metaphor develops in the context of **AS IF. This is the wizard called AS IF that, releasing us from logical limitations** (psychological barriers), **allows imagination to manipulate images freely and easily**. Going beyond the limits of incompatibility, metaphor synthesises new concepts, activates the work of imagination.

The incompatible compatibility

Any metaphor consists of heterogeneous objects. One of them, denoting, is the **basis of a metaphor**: **coal basket** is the symbol of the coal-miner's occupation. Another object, auxiliary (in our case it is the **state of flowering)**, is the **figurative component;** it is the latter that begets imaginative and associative complexes in consciousness. Therefore, if the basis of a metaphor determines the design and aim of an author, the possibility of the suggestion "**as if'** provides the choice of an auxiliary object. The **flowering basket** associates notions incompatible in reality.

Thus, metaphor as if contains potentially the power destroying the limits of impossibility, capable to draw the far nearer and to ennoble the usual, to speak of it in new, unusual words.

Bringing together two notions most completely different to one another, metaphor leads to a complex semantic outcome with manifold associations.

At the confluence of an image and meaning, metaphor exceeds the bounds of revealing available similarities; it creates new meaning and develops into its variety—the **symbol**. Being associated with text and its per

sonages in highly varied ways, the symbol **Scarlet Sails*** becomes the multidimensional, stereoscopic notion encompassing in essence the whole contents of the creation. The symbol is a polysemantic image bearing a bright idea, which associates different sides of reality; it explains abstract ideas through particular objects that express an idea allegorically. Thus, for example, **sunrise** is the image of active ascendance of powers of good.

The essence of metaphor—**allegory**—is the basis of various literature genres (fables, parables, etc.). The tendency to allegory was associated by S.L. Rubinshtein with the activity of imagination.

Multiple unity

Any metaphor contains two or more sides: a literal word phrase *("you perhaps think that the basket you fill with coal willflower*") and a new meaning concealed in the phrase, in our case—the sensation of world's splendour, aspiration of man to achieve splendour in his pursuit and thus to become a creator of life splendour. This new meaning (secondary plan, implication) appears as a result of interaction among words constituting a metaphor, or rather among their features and associative complexes, and creates an image realising an author's idea.

The intention of a subject (**linguistic person**) plays the main role in creating images. This intention creates a new meaning within the limits of previous knowledge, feelings, sensations, and determines the words whereby a metaphor can perform its рифове.

"*I was 16 years old—and I already knew how severely stung the* ***bee—sadness*****" (A. Green**). But sadness can be phrased otherwise: *"A man covered himself with the coat of melancholy*."

The selection of a complex of factors allowing to create a complicated and developed metaphor reflects individual oneness and inner intention of an author. Each of metaphor's elements is accompanied with its associative field—encyclopaedic, national-cultural lore or one's personal reflection as well as "linguistic feeling," that is understanding of associative field of a meaning.

6.4. Metaphor as a creative process

Metaphor appears because of fundamental peculiarities of human thinking; one cannot manage without it, it is inherent in human thinking as

* The title of the A. Grin's novel cited above—**trans.**

such. Metaphor is based upon ambiguity of notions which man uses, reflecting in his mind manifold non-linguistic outer activity.

Metaphor always suggests a certain problematic situation with multitudinous variables; that is, it is a task with no answer available a priori. The realisation of it is determined by the author's intention and can be considered creative process, as it produces new notions of new images.

The function of metaphor as a rhetorical device exceeds the bounds of extrapolating simple sum of meanings of words that constitute a metaphor. Metaphor is a system, and at interaction of basic (denoting) and auxiliary (denoted) metaphor's components, a "systemic" effect appears, that is allegory, the appearance of metaphorical meaning. This new meaning constitutes the main difference between metaphor and comparison. Besides, metaphor creates a psychological phenomenon—the ability to associate and activate emotional and intellectual fields of personality.

By uniting logical and sensitive perception of the world, metaphor settles contradictions rising at its cognition. Metaphor provides comprehension of not only the natural world but also ideal one. Through metaphor, visualising the subconscious, we communicate with our inner world; being conscious of our feelings and emotional state, we verbalise them through comparison of them with something real **[60].**

The **mechanism of metaphor** can be represented as a range of thinking operations; at the first stage an author's design rises and an object **(metaphor basis)**, allowing an author to express his idea, is being searched for. Likewise, an author produces by association some images and notions and chooses those suitable for his design.

At the second stage an author selects an auxiliary object, that is the **imaginative component**. It is here that the main difficulty appears: what is the object the basis of metaphor should be compared with? what is the word that would contain the potential capable to disturb the borders of the impossible, to draw nearer the far and to ennoble the usual, to tell about it in a new, unusual way? It is the auxiliary object that, through the suggestion "**as if**," causes the appearance of imaginative-associative fields in mind.

The third stage consists in **synthesis**—the creation of "ideal reality" in imagination to obtain a new semantic outcome with manifold associations. Metaphor, as a verbal device, consists of a literal verbal phrase that brings together objects incompatible in reality. It is in this interaction of incompatibilities, or rather, among their features and associative complexes accompanying them, that an author creates a new polysemantic image realising his design.

Thus, to create a metaphor, thinking process ought to have such qualities of creative thinking as flexibility and the ability to analogise, and, to make a metaphor unusual and aesthetic, such qualities ought to be inherent as originality, i.e., the ability to look at things in a new fashion, and receptebility, i.e., the ability to notice tints and nuances [61]. Metaphor can be practicable only at the assumption that incompatible things do have similarity in real life; that is, metaphor rests upon creative imagination. At creating a metaphor, the close association between imagination and thinking appears; it is by means of original and independent thinking that intellect forms conscious images and imagines something unknown in reality.

Thus, **the process of creating a metaphor consists of a sequence of creative stages and on the w hole requires the presence in an author of a complex of qualities being components of creative thinking [62].**

Synchronous presence of the strategy and requirement of creative thinking components at composing a metaphor allows to use this process:

1) *as an indicator of creativity;*
2) *for conscious creation of metaphors;*
3) *as a teaching task for developing components of creative thinking.*

If one defines the notion **strategy** as the presence of a design, a plan, consistency, and purposefulness in search at solving a problematic situation according to aims chosen beforehand,—this notion would be completely suitable for designating the process of creating a metaphor.

6.5. Using metaphor for developing skills of creative thinking

Investigations of psychologists and pedagogues have demonstrated that conscious students' comprehension of their thinking strategy contributes to the increase of education efficacy. So if the phrase *"to understand a metaphor means to trail in mind the way it was created*" is true, the process of creating a metaphor, from the perspective of manifestations of personality's creative purposefulness, can be viewed as a leading component of creativity, as an indicator of its intellectual activity.

The task **Create a fictional image of an object** is part of the complex of exercises in developing creative imagination and can be performed according to the algorithm suggested below. The algorithm enables one, without restricting "linguistic personality" in the range of choices and thus without disturbing subjective character of creative process, to conduct purposefully the search for most original word combinations, to enrich variety of ways of constructing metaphors upon the basis of the systemic approach and to apply the ways consciously. This allows to construct metaphors of different complexity—from simple comparisons up to original fictional images.

The **ALGORITHM** consists of three stages (steps):

1. Revealing features of the main object.

Write down in a column features of an object, both essential and non-essential.

2. Systemic search for an auxiliary object through establishment of similarity (associations).

Select for each feature objects and phenomena wherein these features are present, or write down associations produced by each objects' feature. Find these associations in nature, technics, common life, among fairy-tale and fantastic characters and objects, in any kind of human activity.

3. Selection of versions (according to the principle of morphological matrix) to choose the features combination required.

Choose among the words you have written down those which will be useful for you in realising your design to create a fictional image of an object **[62].**

Example

As the basic object use the notion

HYPOTENUSE

The object's features:

—straight line;

—the longest side of a triangle;

—enclosed with catheti, or, conversely, joins them together;

—always located in front of the right angle.

Write down associations appearing by analogy with every object's feature, and imaginative analogies related to each of the features.

Associations that can be provoked by the feature **straight line:** *sun beam, sight line, magic stick, purposefulness, honesty and strictness in behaviour, insistence,* etc.

Versions of imaginative analogies:

—strict line (always opposite to the right angle);

—the magic stick turns a right angle into a triangle;

—hypotenuse, like spring sun beam, created the triangle and brought geometry into existence.

Associations and imaginative analogies related to the feature **longest**—*equator, sleepless night spent in waiting for the dawn.*

In this case one may say:
—the equator of a triangle;
—a sleepless night between catheti.

Associations and imaginative analogies related to the feature **joins** (meaning that the triangle would not be without **joins catheti**):

—the side that creates a triangle by its efforts;

—stick (cement);

—love, interest.

Hence the imaginative analogies are possible:

—the third that is not an odd thing out;

—the support for catheti;

—the love that created a triangle.

Considering the hypotenuse as "clutched" between two catheti, other analogies appear: *suppressed inflexibility, clutched tension, restricted purposefulness.*

Always in front of (the right angle) can produce the following associations:

—an artist in front of the easel;

—a mirror image;

—one river bank in front of another;

—the sea "in front of" the sky.

The hypotenuse is the right angle in the mirror world.

The life contains a lot of right angles, but a few hypotenuses...

It is notable that metaphor is always subjective, it reflects personal attitude of an author to his selection of an auxiliary object. As for the brilliancy of images being created, it is determined by the range of objects and phenomena among which associations can be established, and by richness and force of feelings, i.e., emotional attitude; therefore, at creating a metaphor the intellectual experience of an author and his individuality are of great concern.

That is why the author suggests to consider metaphor as an integral indicator of creativity. So, if metaphor is an instrument for creating an image, one can say that, from the perspective of psychology, it is in metaphor that an author, at creating a metaphor, laconically realises logical, associative, and imaginative parameters reflecting the general run of developing personality. It is those parameter's complex interaction that creates the unique intellectual-emotional aesthetic effect of "experience" of splendour, which Emmanuil Kant defined as the "play of cognitive abilities" [63].

Chapter 7

THE DEVICES FOR CREATING FICTITIOUS IMAGES

"There are regular ways of imaginary metamorphosis of reality; they are realised in typical modes or methods of conversion "
[25].

These regular methods, this "logic of imagination," are well studied by the psychology of creativity. In particular, they are realised in technical creativity through the "tactics"-methods, which compose the strategies of creative thinking [5]. In fiction creativity the "logic," however, is camouflaged with imaginative character of words.

The **tropes**—the devices of imaginative speech—are based upon logical structures "dressed" in words which form "clothes"—**images**. The following devices are usually attributed to tropes: **metaphor, personification, comparison, hyperbole, litotes,** etc., which are the devices of fantasy in creation of fiction, such as tales and myths. In these genres tropes perform double function: they not only create images but also allow to escape from reality into a fictional world, providing the possibility of unusual development of a plot.

The aim of introduction of the device is to change a certain phenomenon or property of reality to the extent that a new quality would appear, and thereby to assist an author in realising the main design of his creation.

The following devices belong to the main ones:

1. **Antithesis**—change a quality or property of an object (fact, statement) to the antithesis. A fact itself can also be changed to the antithesis.

A variety of this most universal method is the method most accepted in myths and tales—adding properties of a living object to an inanimate object (fact), and vice versa.

The principle of antithesis can be applied not only to objects and facts but also to methods per se, wherefore there is the contrary method for each of them.

2. **Splitting up—unification**. Divide an object (fact, statement) into its constituents, or integrate constituents of different objects into a new whole.

Do you recollect Zita from the story by Clifford Simak? It was the "unification" of all offspring of the planet Leyard, which, having united,

became a single organism but in case of emergency they could "scamper about."

3. **Acceleration—deceleration** of an action (fact).

4. **Hyperbole—litotes.**

5. **Universality—specialisation.** Make an object (fact) universal so that it could effect a wide range of phenomena, and vice versa—make the effect of an object highly specialized.

6. **Continuity—discontinuity**. If the action of an object is interrupted—make it continual. If the action of an object is continual—make it interrupted.

In the book *Monday begins on Saturday* by Strugatsky brothers, one of the personages—U-Janus Poluaectovich Nevstruyev, who studies parallel worlds—and his dear parrot Photon live "in the reverse direction,"
i. e., moving from the future to the past. This movement, however, is not continual. At every midnight U-Janus locks himself up in the cabinet to shift from the Yesterday to the Today.

7. **Dynamism—static character.** A fact being static, make it dynamic, and vice versa, a fact being dynamic, make it static; for example, in *The tale of the dead princess and the seven bogatyrs* all fell asleep of the fairy's touch.

8. **Changing properties.** Change the least changeable property of an object (fact) or its settings.

Change a law of nature.

9. **Taking out—adding.** Separate a function, part, or property of an object (phenomenon), and vice versa: add a function or property of an object (phenomenon) to an utterly different object. It is this method that the focal objects method already known to us is based upon.

Intellectual training may comprise the **task Produce a new fictitious object or concept**, using for this purpose the devices of fantasy set forth above. The aim of each task is to obtain an essentially new concept for a science-fiction story.

Forewarning that knowledge of the methods affords only a direction of thought but does not save one from thinking, P. Amnuel **[33]** offers to work with the devices according to the following

ALGORITHM

1. Choose the object (phenomenon) you want to change.
2. Define the purpose of the object, its basic characteristics and features.
3. Choose the method.
4. From the list of characteristics choose that one you will change. You may change the object as a whole.
5. Change the characteristics by the chosen method and reveal which new quality has appeared as a result of the change.

Take the process of **writing a book** as an example of application of the methods for creating a fantastic concept.

A book is written to communicate and preserve different information. After a text was written by the author (the stage of a **manuscript**), a book is designed, published, and represents an object (production of printing industry) consisting of paper sheets containing author's text and arranged in a certain order.

To obtain a new idea, use the method **Discontinuity**.

Apply this method to the whole process of writing a book: *a book is written uninterruptedly.*

Thus, an author is going on to write his book even after it has been issued and probably even sold, so that newly described actions of the personages appear in all of the already issued specimens... A kind of an *endless book...* Or otherwise: each time rereading the book, a reader finds a new unexpected page...

Another version of this idea is possible as well. Each reader asks an author to change anything, debates, learns to think juxtaposing actions of personages to their characters and logic of their development. Book writing becomes the process of co-creativity (the method **Splitting up—unification**): first a book is written for everybody, then it is adjusted to each particular reader.

Note that these ideas are not so much fantastic technically speaking as it was twenty-thirty years ago: typing text with use of a computer and the integral computer network allow an author to communicate with each of the readers...

In lieu of

CHAPTER 6

Finally, to experience application of the methods for creating fictitious images in fiction, you may read the tale offered below as an impressive example of creative attitude to imaginative work.

Alla El'ster

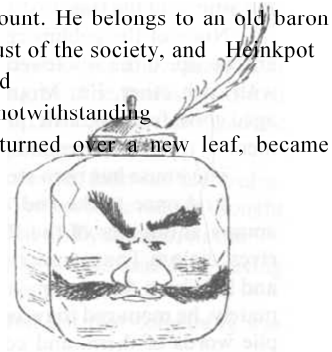
A springtime tale

In the eastern part of the town, in a small wooden home with a palisade, there lived the Professor of elfolinguistics together with his friend (and constant opponent) Heinkpot.

As known, elves avoid to appear in public, moreover they don't talk to and initiate everybody into niceties of their language (by the way, highly complicated and having various dialects). Once having felt dissembling, rudeness, or boredom in an interlocutor, an elf flies away and does not return for ever. That's why specialists on elfolinguistics are very few. The Professor is one of the most distinguished. It was he who revealed, for example, that the language of elves and its every dialect doesn't contain the notion is not. (When an elf is told about something absolutely incredible, he says: "This happened some other time," or "in some other place," or "to some others," and he never recognises something to be utterly impossible.)

The Professor has remote maternal kinship with meadow elves and resembles an elf himself by his diminutive size and tenderly green wings growing on his back. He's so much intelligent, friendly, and sincere that elves, usually shy, fly to him unceremoniously to drink a cup of tea. (The Professor has inherited a beautiful tea set with little blue flowers; cups and saucers of the set can get smaller or larger depending on size of that who takes them.)

The Professor writes his scientific works in co-authorship with respected Heinkpot. Heinkpot is made out of real crystalline and has the bronzi mount. He belongs to an old baron family. elatives belong to the upper crust of the society, and Heinkpot is very proud of them cousin Decanter, who,notwithstanding that he s life in vices, has recently turned over a new leaf, became respecta Royal Palace.)



H avy temper. He's always grumbli ne Professor is telling him about h t is for a long time yielding thunder vhy he must listen to this comple being occupied with a thousand of other matters, useful and pleasant. But then he calms down and, having looked sideways at the Professor to see whether the Professor had felt insulted (the Professor usedn't to feel hurt, for he liked Heinkpot), begins to set forth his considerations, always very valuable because Heinkpot possesses immense knowledge and common sense.

The elves attending the Professor have already been accustomed to Heinkpot's knitted brows, heavy look, and thunderous voice. For some reason they aren't afraid of him at all, talk to him with pleasure, or simply sit on his bronze cap.

The house of the Professor and at the same time the Professor himself and Heinkpot, two old slovenly and disorderly bachelors, are looked after by the housekeeper Fru Mouse. She, as befits a good housewife, is fatty and clean. She has small round shiny eyes, a little round rose nose, and wears a dazzling white apron and cap. She yields thrift and housewifely attitude to everything—she's a house mouse. Sometimes she can grumble nearly like the Heinkpot, and of course she's absolutely confident that without her concern there would be in the house neither jam to tea nor candles in the candlesticks, there would be nothing but dust and mess.

Fru Mouse is on best terms with the family of goblins living on the second story in the house.

Usually it is accepted among goblins to live alone. Once there really lived an alone goblin, and then some young and not yet having any home relatives have joined him.

The old house got dark of time; the wooden staircase led to the first floor; the beehive for elves was in the palisade. There were also carve columns supporting the porch, shutters on the windows, and the window on the attic, and the flue...

None of the goblins could leave such a house. They've stayed there and occupied the whole second story in the building, being on best terms with each other, Fru Mouse, blue-blooded Heinkpot, the Professor, an aged ghost from the attic, and two moles which had added the house basement to their underground possessions.

The house has been steeped in still cosiness.

And once at the end of February a manuscript has been revealed among antiquities of the Royal Library. It was written in an unknown elves' dialect. The manuscript was immediately delivered to the Professor, and he'd been deciphering it with enthusiasm nearly for two months. Ultimately, he managed to recognise characters in half unfamiliar signs, compile words of them, and comprehend the meaning of some words. The Professor was astonished: the manuscript told about marine elves!

Elves are very miscellaneous and dwell in different places. Woods are inhabited with curious, lively elves like small birds with thick and almost non-pellucid wings. In highlands there live big elves having dark eyes and strong wings, narrow like swift's ones. Meadow elves are golden-green, with pellucid and almost invisible wings. The smallest elves inhabit gardens and city squares. In autumn they like to go down on falling leaves, so that one can, at collecting an autumn bunch of flowers, take at home some elves sitting on the leaves. So don't be surprised when you'll see them sitting on the rim of a vase.

But nobody heard about marine elves, living in places without grass and trees. Meanwhile, it was they that the part of the manuscript deciphered by the Professor has told about. And also about their dances over the ocean at festivals of the Sea World. The description of the festivals themselves was comprehended poorly by the Professor as the celebrations were almost completely described in unknown words that had no analogues in other elves' dialects. He has only realised that the eyes of marine elves had the colour of sea waves, their wings were constantly changing the colour, and that marine elves reckon themselves arisen out of waves lapping.

Having read all that could be read, the Professor was sitting for a while at the manuscript. Then he rose, walked round the cabinet, beholding not the usual bookcases but elves' dances among waves, and went to look for Heinkpot.

Heinkpot stood at the mantelpiece in the parlour. Having listened to the Professor, he by habit started grumbling and making malicious remarks: 'Marine elves! Nonsense!!! The manuscript—rubbish!!! The unknown author of the manuscript is a falsifier! The respected Professor seems to be puzzled? But would it not be better for him to think about dinner?' Et cetera, et cetera...

Elves stopped dancing before the Professor's eyes and vanished. It was getting dark. Everything around became grey. The Professor looked out of the window. The goblins were digging up the lawn. He dropped the manuscript and, having forgotten about dinner, went to bed.

Heinkpot, awfully bewildered and disconcerted, followed the Professor with his eyes. He meant no offence to the Professor! He merely thought that a bit of scepticism... What an ill luck! What a silly thing occurred!!!

Heinkpot was sighing and frowning for a long time, and then, having also forgotten about dinner, fell asleep at the mantelpiece.

Fru Mouse hardly entered the parlour but felt that something was wrong and quickly hurried to her room.

The window in the parlour was left open.

At night it began to rain hard. The rain was a real springtime cloudburst. Water made a noise in the darkness, the wind stirred up branches of trees. And of course there at once appeared many rain spirits. The spirits had subtle streaming coloured silhouettes appearing and disappearing together with the rain. They did not sing but played with virtuosity various music instruments without which nobody ever saw them.

Whether instruments of the rain spirits were unusual or the manner of their play was, but, while they were playing, the air was not merely impregnated with music—it was getting rainbowed. Every note corresponded to a colour of the rainbow, and a colour changed its tints and shades as sounds changed its tune and volume.

The music of the rain spirits can be inhaled. But he who has inhaled it loses his quiet. And that's what the spirits wait for, wherefore they rush to doors and windows opened while raining, surround those who walk without an umbrella and don't think of wet shoes (umbrellas and rubbers frighten them off), and play their fairy melodies.

As to the Professor, the rain spirits usedn't to worry him. Why should they impede the venerable scientist to do his job? However—that has been their nature—they cannot fly by the window wide opened during a springtime downpour for no particular reason. A dozen spirits flew into the room with streams of the rain and began to tune their instruments.

Heinkpot, who had been sleeping at the mantelpiece, suddenly awoke in the night. The cold fresh air around him was singing, now softly shimmering now brightly flashing. Sometimes, among the currents of multicoloured sounds, one could see huge eyes of the spirits, their thin arms holding flutes, a guitar, and a violin. But the amazing melody fascinated both sight and ear and hindered to see the musicians clearly.

The Professor, who couldn't fell asleep, heard unusual sounds from the parlour and went to look at what was going on. The melody captivated him at once; that was the melody of his dreams and thoughts. The Professor, listening to the melody with delight, stood noiseless behind the velvet curtain used as the door of the parlour. From time to time he sighed deeply. From another side of the curtain there glimmered the eyes and stuck out the curious nose of Fru Mouse. She'd woke up to turn the unbidden guests out, shut the window, and wipe the puddle on the floor, but... was enraptured with music.

The spirits were playing...

The dawn came. The rain stopped. The spirits vanished. Their listeners were slowly coming to. The Mouse and the Professor, shivering with morning cold, started to put the room in order: they shut at last the window, dried the curtains, and wiped the puddle on the floor.

Heinkpot was looking at them with his brows knit and gave his commands absently. And, when they had started to kindle the wood in the fire-place and talked about a cup of hot coffee, he suddenly exclaimed: 'To hell with your coffee! Did you really forget which day is it today? We'll hardly be in time!' The Professor and Mouse gaped at Heinkpot in surprise. 'Tomorrow is the day of the vernal equinox,' Heinkpot said. 'Hurry up, hurry up, the Little Donkey is perhaps close by!'

Here we have to be somewhat wandering afield and explicit what the Heinkpot meant. There is out of the town the area called the Crystalline

Hills. These Hills are rather low, picturesque, and covered with heather. By day they have the only peculiarity: they can't be counted precisely. One can come to the Crystalline Hills and see three hills on Sunday and five next Friday. You can come down from one of them, ascend another one and find only the four. Being in a company, each of visitors can see a different number of the Hills.

But that's by day. In the evening, at sunset, the Crystalline Hills start to play and sound. Their play resembles tinkling of crystalline bells (hence their name). Music of the Hills is extremely multifarious. There occur the nights, however, when the Hills, as if performing an old rite, play year in year out the same melodies.

Such nights are much talked about in the town. They say that the life of a man having come that time at the Hills can heavily change. And, if a man feeling lonely kindles fire on one of the Hills, he'll certainly be visited by those who will come to warm by the fire and soon become his friends.

If one, standing on a Hill at the night of the summer solstice, takes some water in the hands and looks at, it one can see a piece of future.

If one kindles a fire on the Hills at the New Year night, someone certainly comes out of the flame, and even the Hills themselves don't know who is it because it has to be a New Year surprise. And that who hears music of the Hills at the spring equinox night will be happy all the year round and maybe even longer. And if he has not earlier done right things to reach the happiness, he understands and learns how to find his way—the Hills' music gives necessary power for it.

Strange as it seems, at the night of the vernal equinox people don't rush at all at the Crystalline Hills. Inhabitants of the town find their ways by themselves, and as to newcomers... Few can resolve to interrupt the accustomed and usual life course and change the blue bird in the sky for a tomtit in hands...

The town was small, and public transport was needed rarely. The denizens habitually used their feet and wings for moving. But if it was needed to carry something heavy, there lived and worked the Little Donkey with his small cart. The Little Donkey ran round the town all day through, brought, delivered, drove, and never refused to help anyone. But on the eve of the day of the spring equinox donkey's stubbornness arose in him, and he refused point-blank to go anywhere but the Crystalline Hills. From the morning he went around the town, invited in the cart those who also planned to go there, and made for the Hills. It was that Little Donkey who Heinkpot talked about.

Here the clatter of hooves was heard, and now all the three—the serious Professor in his gown and a cap on the head, cunningly smiling Heinkpot, and Fru Mouse who did not forget to take some sandwiches and warm scarves—were sitting in the cart.

How will I tell you about the spring melody of the Crystalline Hills?..

The Professor, Heinkpot, and Fru Mouse selected the place on a hillside. The Little Donkey nodded approvingly and disappeared. Earth has got dry and been heated with beams of the sun having set just now. The growing grass was calmly rustling, bells were tinkling, and everything was shining with tenderest pearl light. And maybe it was stars that were shining...

In the morning the Professor woke up from earth, spread his wings under the sun, and said: 'We are going to search for marine elves!'

'We are going to search for marine elves!' Fru Mouse squeaked joyously. Heinkpot made a wide grin and nodded.

And then they left.

Conclusion

In modem pedagogy a tendency becomes increasingly evident to shift of emphasis from methods providing learning knowledge to technologies allowing to provide general **development** of child's **personality.** Such technologies should be based upon patterning intellectual activity contributing to manifestation and formation of creativity directly in the teaching process. Such patterns must contain both an element of predetermination, which provides purposefulness of formation and possibility of translation of training technology, and that of uncertainty, which is necessary for emergence of creative activity [65].

The author aims at providing possibilities of using laws of creativeness to develop contents and motives of teaching all children and students. The author holds the opinion of a number of specialists to the effect that, irrespective of knowledge specialisation, there exist universal regularities of human thinking, wherefore those parameters of creativeness, which shaped in one field, can be extended to other kinds of activity. For this рифове it was necessary to elaborate a complex of patterns, which would not only contribute to development of thinking and imagination, but also be a tool of self-cognition and self-development. The originality of this, complex consists primarily in special rules of performing every exercise. The offered rules provide organisation and pattern the operations of creative thinking process and thereby develop thinking components defined by psychologists as creative.

On the whole, the exercises of the offered complex serve as guide lines in the process of conscious processing and comprehension of information, elaborating skills of active creative thinking activity.

The exercises in creating images, stories, metaphors suggested work with the most creative material—language; they activate and enrich vocabulary, inspire good wording, facilitate verbalisation of thoughts.

The exercises developed upon the base of the systemic approach promote organisation of effective comprehension of processes, resting upon logical memory.

Metaphor, the most creative linguistic device, arises in the field of emotional attitude to an object. Metaphor produces continuous "joining" new knowledge to that already available. Efficacy of imaginative analogy comprehension is conditioned by analogy's psychological essence, i.e., the ability to activate emotional and intellectual spheres.

«

The exercises can be performed in the form of creative training. Varying complexity of tasks, one can use each exercise with different aims in relation to specificity of children's groups:

—to correct and activate intellectual processes;

—to develop cognitive processes and need in intellectual activity;

—for more gifted children—to develop their creative possibilities. Having passed through the phase of non-evaluated occupations, one may introduce criteria of children's self-assessment of their tasks.

The exercises can be viewed as intellectual creativity whereof a result can be an aesthetic response. Aesthetic attitude occurs when creativity, remaining a tool of achieving an outer objective in every human activity, is at the same time perceived by man as something self-supporting. The more personal aesthetic satisfaction of intellectual activity, the faster the latter converts into a life necessity.

Practice shows, however, that a teacher realising this task ought to be himself a gifted person having taste to intellectual creativity.

Life is the process of interaction involving acceptance of people by each other and thereby removing barriers.

Considering that development of man is a general value, such an interaction becomes considerably creative and stimulating this development. Thus creativeness, displaying richness of the inner world, appears as self- sufficiency and becomes the realisation of the sense of life, the mission of man.

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