

Interaction and interdependence of somatic organism and psyche in childhood

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In order to clarify the interconnection and interdependence of the human somatic organism and psyche, their nature is discussed. The somatic organism is a specific morphological functional system, developing in every being. The psyche is a functional structure developing individually in the course of ontogeny, under the effect of internal processing influenced by the environment.

The function of conditioned and unconditioned reflexes is discussed including the way in which the conditioned reflexes are built up on unconditioned ones. The mechanism is described, by which the psyche develops in the individual and how its functions manifest themselves.

A concept is discussed concerning the structure of the human psyche, the system and nature of the conscious and unconscious functions.

The personality is the manifestation of the interconnections and the formation into a system of the somatic organism and the psyche. This interconnection brings about the socialized humanization of the vital processes in man living in society.

A concept concerning the essence of personality is discussed, emphasizing the "actual personality" and describing its structure.

Clinical examples are given concerning the interconnection of somatic organism and psyche and the somatopsychic and psycho-somatic processes, and conclusions are drawn for the purposes of education.

The interaction of the somatic organism, a morphological and functional system special to every human, and of the psyche, a functional structure determined by individual development, can properly be interpreted only if the individual formation and the nature of the two systems are taken into consideration.

I. THE SOMATIC ORGANISM

The human soma is formed in the course of fetal life, birth, infancy, childhood, adolescence, adulthood and

senescence including maturation, development, stabilization of the developed characteristics, and regression, under the effect of basic laws realized in the chromosome set, in the zygote, and as programmed in the course of phylogeny. Under normal circumstances this system enforces the development of functional formations of morphological and physiological character, characteristic of the organism of every human, irrespective of its type or constitution. Starting from the zygote, all organs develop in a determined formal and functional form, the function of the organs

becomes co-ordinated, different functional systems come into existence, and a somatic entity develops which requires and at the same time secures the internal expediency of the function of these systems. This entity is probably more than a summation of its parts. In spite of deviations in the course of life, the basic balance of this entity, its somatic homeostasis, is secured neurally, by intero- and exteroceptors, and humorally, through the exchange of body fluids, where the different materials of the fluids influence the sensitive nerve cell groups, the transmission of information.

So there is a certain directing and executing system within the somatic organism. The directing system aims at ensuring survival of the organism, and after a certain maturation its self-repetition and thus survival of the human race. The system asserts itself both in health and in disease. In the latter case the system directs and activates the functions expelling foreign materials from the organism, or neutralizing these materials; and the functions balancing deficiency or satiety states, or those restoring morphologically traumatized parts, and the functions ensuring a bridging over of injured or lost parts.

Thus, the somatic organism develops and matures according to genetically determined rules valid for every human, even under the most different external circumstances, according to identical morphological, constitutional and functional patterns, with negligible individual differences.

The basic function of the somatic organism is to satisfy the actual needs and demands of physiologic character. While doing so, the partial functions and their co-ordination follow past experiences, everything happens according to previously established methods. This means that the perception of needs and demands in the course of life, the attempts at their satisfaction, and the ability to satisfy the internal conveyance of materials and the functions of movement, develop in different parts of the soma as programmed during phylogeny. All these activities aim at safeguarding the maturation and survival of the individual organism at a given time.

The unconditioned reflex system, one also programmed during phylogeny, means the internal mechanism meeting the needs and demands of physiologic character. At the beginning of ontogeny it corresponds to the ability to develop the unconditioned reflex system. The source of stimulus in this mechanism are the needs and demands caused by some vegetative change of physiologic character at a given time, and the reflex arc is the chain of unconditioned reflex processes in the first signalizing system. The end of the chain is an event covering the needs and demands. This concerns both the parts of the soma (cells, tissues, organs, systems) and the organism as a whole.

The important unconditioned reflex mechanism involves the responses of heart function, blood pressure, the tonicity of blood vessels, respiration, the activity of sweat glands, the func-

tions of the digestive apparatus, the systems of urination and defecation, cellular metabolism and the endocrine system. There are in addition the orientation reflex, searching and seizing by mouth, sucking and swallowing, signalling by crying (by uttering sounds), clinging, escape, protective movements, restlessness (torment) elicited by needs and demands and manifesting with crying and movement, and calming down (joy) elicited by the satisfaction of needs and demands. All these unconditioned reflex functions are constant characteristics of human life under healthy circumstances from birth to death. Thus, the basis of functional activity and manifestation of the soma is an endeavour to satisfy needs and demands of physiological character. The stimulus inducing the pulsation of life therefore arises from needs which have attained a certain intensity. The mechanism of functional movements is an unconditioned reflex process. The purpose of functions is a response to the stimulus by acquisition from the external world or by the mobilization of internal reserves. The guiding principle of starting and maintaining these functions is ultimately to secure the individual's survival, and through this the survival of the race.

The development of needs and demands, the mechanism of meeting them, the acquisition of materials from the outer world, the mobilization of internal reserves, and the purpose of satisfaction comply with general biological and physiological rules. Thus, the stimulus-excitement

in the somatic organism, the internal and external processing of them, the relief and response, are all of biological-physiological character, i.e. specific to man as the direct manifestations of nature characterizing all living organisms. The organism ensures the biological continuity of human life, and it is this biological-physiological formation which opens the possibility for all human events. The specific functionality called higher nervous system, develops within that formation. The psyche, as a specific human formation, exceeds this merely biological sphere.

Some of the details concerning the soma as a separate entity are still disputed. These are, however, of minor importance. The theories relating to the development and nature of the human psyche are more complex.

II. THE PSYCHE

It was perhaps Platon who expressed most precisely the idealistic concept concerning the psyche. According to this concept, the spirit is eternal, the primary essence of human existence. The eternal spirit used to be considered separate from the body. This view cannot be maintained in the light of present theoretical knowledge and experience. It will suffice to mention that physiological changes can be brought about in the nerve cells without morphologic changes, merely by drugs or other agents binding specially to certain nerve cells, and thus the psyche can be influenced, changed through these physiological changes. The roughest influence of

this kind is general anaesthesia. The anaesthetics suspend the activity of certain nerve-cell groups, and in this way suspend the whole psychic function. Certain drugs cause depression, others may act as euphorians. Phantastic visions and hallucinations, generally considered psychic manifestations, may also be elicited by chemical agents. Paediatric examples are the chromosome aberrations, when enzyme deficiencies, typical physiological disturbances, lead to mental retardation. There are some mental disturbances, which can be cured by specific diets. And, lastly, the "spirit" or some "spiritual" activity may totally change in certain illnesses due to morphological changes. On this basis we believe that the medical way of thinking can effectively be employed to understand the essence of the psyche.

The psyche in the living organism is the functional entity of certain special activities of the brain, of the central nervous system. The term, within the living organism, must be emphasized. The brain removed from the organism, or a tissue culture of nerve cells, do not have psychic functions. The co-ordinated activity of the peripheral nervous system, the organs of sense and locomotion, the endocrine system and the extero-interoceptor system are essential conditions of psychic function. Actions are not the result of merely the peripheral and central nervous system, but the musculature, the joints and the skeletal system too have an essential role in it.

The human psyche interpreted in this way is not eternal and not a primary matter. It develops individually in the course of man's life. During individual development it constantly undergoes changes, and at the end of man's somatic life it ceases to exist.

This view concerning human life includes the principle that as regards the psyche, everything starts anew in the individual at birth. The psyche is formed by the everyday human existence during ontogeny. The psyche is a functional unity of cybernetic character, which directs behaviour and action, it has the task to think and to perceive the world, to interpret and evaluate both the external and the internal world while building itself, governing itself and expressing itself in each phase of the individual's life. The psyche develops separately in each individual as a result of the events which have taken place until a certain moment of life, so that from birth each man lives in a specific natural and social environment together with the other subjects of this environment. It influences these environmental factors in an active and passive way, and in both ways. Thus, the psyche is an individual function corresponding to the level of maturation, the development of a given phase of life in every moment.

This view includes the fact that the human psyche does not come into being all of a sudden, but is the result of a certain process. The painters of the Middle Age illustrated in beautiful paintings on the basis of biblical de-

scriptions, how the Holy Ghost came down from heaven and gave spirit all of a sudden to people at Whitsuntide. However artistic the imagination and illustration of that kind is, it contradicts reality, since the psyche does not arrive into man from outside all of a sudden. This is not the way how the psyche develops. But not in the way either, as Pallas Athene had burst out from the head of Zeus on the stroke of Hephaistos' hammer, totally mature, ready for defence and attack, in full armour and beauty. In reality, the psyche is the result of a development in the course of individual life. The human psyche, as a special function, is an individual product, a product not of material character, but a function.

To elucidate this issue it has to be taken into consideration that today's human being is essentially of social character, though it has a biological basis. Environments of social character are decisive in development of the psyche. Environmental effects have the characteristics of human communities. In the newborn, infant, young child or the young man social environmental effects are realized through the mother, father, the sisters, brothers and relatives, through the family as a whole. In school age, effects are realized through schoolmates and adults, especially teachers. In adulthood, first of all the colleagues and the community of the working place are of influence, and this influence is realized in living together, acting, interpreting and evaluating every thing together with other people.

The main point of this coexistence is that the individual and his environment represent a functional unity. The younger the individual, the stricter the rule. The internal environment of natural and social character consists of physical and chemical elements, objects (instruments), persons, systems, structures, real actions, phenomena and abstract meanings (heritage and actual qualities) from the beginnings of individual life. Within this functional unity, the process of coexistence has a tripartite mechanism and function from the point of the individual.

1. The first is a system of events including the individual's efforts and activities to adapt himself to the environment actively or passively;

2. the second are the efforts and activities of the individual to change the environment;

3. the third are the conscious and unconscious efforts and activities at storage in the course of the previous two functions. Having reached a certain level of maturity, these systems become interwoven and affect the individual as a totality. The results of these actions are called adaptation and accommodation.

It belongs to the above interpretation that the result of the functioning of the psyche reacts secondarily upon both the individual and the social existence. Once the psyche is fully developed, the individual keeps connections with the external world and with his own internal world, his own remembrances, connections. Keeping connections with the external world

consists in giving and receiving signs of communication character. To keep connection with the internal world consists of codification and interpretation of signs as well as a subjective evaluation of informations.

The psyche as a function not only enables, directs, determines, regulates and manifests these connections, but also reflects them. It reflects them in somatic changes arising under the influence of the connections, and beside this passive reflection, it evaluates the stimuli and excitements derived from the connections actively and from the point of the individual. The psyche is, therefore, the unity of the activities of connection-keeping and of psychic contents accumulated until a given time at a certain level of development. The latter is the world of memory. This world of memory is partly static, being a system of knowledge and experience fixed verbally, and partly dynamic, being a complicated relationship between the activities of the inherited unconditioned and the individually acquired conditioned reflex processes. It is characteristic of this relationship that the past results persist as functional potentialities in the memory in the broader sense of the word. This persisting character of the experiences together with the continuous maintenance of existing connections is the subject of the individual.

The systems mentioned above are interconnected. The existing subject, one of the components of the psyche, is the result of the connection processes in the course of the individual's

life. This determines the two processes of connection-keeping, from which the result basically originates: connection with the external world and with the internal world. The same connection is characteristic of evaluation. Evaluation takes place in the system of information, having developed from the results of connection-keeping based on the world of memory. Evaluation is to a certain extent subordinated to the object of life, which has developed individually. The object of life represents the future of the individual.

The psyche is therefore a) a dynamic system of energy fields, the world of memory; b) a kinetic system of actual processes of keeping connections (communication with the external world, giving and receiving information, connection with the own world of memory); c) a system of internal processing of impulses derived from connection-keeping; d) a system of evaluation of stimuli and excitements concerning the individual himself.

It is essential that both the internal model of the external objective and subjective world and the own model of man himself: the model of the body and that of the ego, are built up in the world of memory of the subject, as a result of the processes listed above under a) to d). The two models together make the internal human model, and there is the individual's world model, the model of existence. This model system makes it possible for the individual to control each phase of connection-keeping with the external and internal world, before every

activity, a preliminary internal consideration of the decision of starting the operative execution of actions, behaviour and activities. It also allows the necessary correction of originally scheduled activities, taking into consideration their expected effect on the models. Finally, it is also this system which affords the possibility of storing the results of events according to evaluation.

The psyche considering its mechanism is cybernetic in character. It is building up, correcting and improving itself steadily through feedbacks, ensuring the continuity of all partial activities according to a definite order and purpose. This cybernetic function of the human nervous system keeps connections with the external world and with the world of memory in order to ensure physiological and psychological homeostasis. The process of connection-keeping takes place mainly in the present, although the evaluation of stimuli, informations and impulses is made on the basis of both the past experiences and the consideration of future possibilities. The evaluation process makes use of the continuously integrated model of the external world and that of the subject formed about himself (world model), both developed with consideration of the future interests and purposes of the individual.

MECHANISM OF DEVELOPMENT OF THE HUMAN PSYCHE

The psyche gradually becomes the specific function system of the

brain, abstracted from the morphological, physiological systems of the individual's somatic organism. This ability of man developed during phylogeny makes this abstraction possible; that is why man is called an abstract sign producing being. The ability of abstraction has rendered man the most developed form of material motion.

The abstracting function is formed into a system under the influence of social and natural environmental effects in the course of maturation. The function develops while living together, acting together with the environmental effects, adapting oneself to them, striving at changing some of them, and storing certain things from the results. Individual experiences and acquired knowledges also belong among the results to be stored. So the psyche is the result of an external-internal integrated active-passive processing of stimuli and excitements elicited by three basic forms of events. In other words, the physiological events of the organism and the function of the organic physiological systems form the biological basis of the individual's morphology, upon which events of physiological character are built up and in which they are built in, from which they are then abstracted, and in the later periods of life these events are built on each other together with the previously developed ones.

The three events are 1. endeavours and activities aiming at adjustment; 2. endeavours and activities at changing the environment into one suited

better for the individual; 3. endeavours and activities aiming at storage develop and become characteristic under the conditions of everyday life in youth. At the beginning, all these are independent partial functions. Subsequently, with maturation, more and more partial functions unite into greater systems. On reaching full development, these systems are settled into a single complex functional entity. In this way the human psyche is the historical result of the individual processing of the life experiences acting on the individual and his social and natural environment, and the result of partial processes, purposes, successes and failures. At the beginning of life, the history of the individual psyche consists of abstractions of physiological functions built upon unconditioned reflexes and being built into them. Later, at a higher level of development, the psyche is made up of certain automatic processes. The different actions and expectations of the society and the adults of the environment: feeding, care, provision for satisfying needs, demands and requirements, habituation, teaching, living, education (rewarding, punishment) are the stimuli processed in the young individual. The psychic system is not static, but dynamic in character, the essence of which is a continuous functioning.

The human psyche after a certain level of development has a structure consisting of two basic functional systems: the system of conscious and that of unconscious functions.

a) The definition of the conscious

is still debated. Its contents and functions are the results of events of life which have taken the form of sensations, ideas and notions. They can be expressed in words used in both external and internal speech. This definition of the conscious seems acceptable, since learning to understand and use words and speech develops a new partial functional system which is then built into the previous primitive, still unconscious psychic system. It means an abstraction of the actual situation and of the specific meanings. Speech means the function of abstraction of perception and sensation elicited by an actual event of physiological character, and at the same time the function of evaluation progressing from the unique towards the general. Internal and external speech provides means for the highest abstractive creative processes.

b) Similarly debated is the system of unconscious functions, the functional system of unconscious contents.

The unconscious functional contents of the human psyche are individual. As such, they are situated in the world of memory of the individual, in the form of individual memories of dynamic character. Individual life is a processing of the results of events of the common life of the individual and his environment.

These dynamic individual unconscious memories of the excitation-excitement processes elicited by certain stimuli are characterized by the possibility and compulsion of being repeated under the influence of a specific stimulus. According to this,

an individually determined form of memory takes place in internal repetition. These specific coded memories can be repeated at different levels of the unconscious. A closed form of the repetition process may take place in the fluid system and in the motion of materials, in the cells and tissues. It may take place in special primitive feelings and emotions. A previous individual state of existence may completely be repeated with the help of the unconscious memory. These individual memories in the unconscious are directed not only toward sex, but toward every field of the former life of the individual.

The contents of the unconscious are not inherited. They have been experienced, built in and fixed in the personality in a closed form, during the early phases of development. These primitive life experiences become fixed during the repetition of the stimulus-excitement processes, of the needs and demands of somatic character. Their fixation means that the same processes are repeated in functional unities by "remembering" certain actual stimuli.

In a more advanced stage of ontogenesis, but before the development of speech, primitive emotional demands of psychological character are abstracted from the physiological demands registered by the individual and from pleasant experiences of satisfaction of these needs and demands. Especially in this age are the repeated wishes and endeavours capable to satisfy the psychic demands, whether or not they had been success-

ful and fixed in the unconscious in the form of closed unities, ready to be repeated through the memory, as elicited by primitive emotional motivations. The unconscious memories of this kind represent the possibility or compulsion of repetition under the influence of certain stimuli.

The unconscious memories are, accordingly, partly needs and demands of physiological character in the very early phase of life, and partly consequences of the fixation of the same processes of satisfaction or failure being continuously repeated, and consequences of demands of primitive physiological character having been abstracted from the earlier pre-speech age. In this way they are built up in the conditioned reflex systems in the course of repetition: These processes affect psychic function in the form of fixed motivations in the coming years of life.

The functional contents of the unconscious have a common point in future life: they cannot be abstracted and formed, composed into conscious sensations, ideas, words or internal speech. If the excitement is realized, it becomes active in the memory under the influence of some external or internal stimulus. If the excitement is repeated and its relief remains in the unconscious, it appears in a primitive form in the somatic events. As mentioned before, the somatic response can be a change of the materials in the body fluids, of organic functions, induction of moods, feelings and emotions in the preconscious with a full repetition of the former individ-

ual state of existence. The response may in addition be short-circuited and manifest with some external movement (physical exercise, unconscious action, outburst of emotion) in a more complicated form.

c) The conscious and the unconscious are not separate static, but dynamic systems in the human psyche. They have complex relations within the construction of the psyche, and have steady interconnections within the personality.

1. The psychic contents are not inherited, but acquired in the course of ontogeny. The abilities and aptitudes are inherited, and then make it possible for the psychic contents to develop, to settle in definite functional systems and to be organized into a cybernetic unit characteristic of the individual living and acting together with other people in society.

2. The basic principle of the psyche as a functional unit is the co-ordination of events and meeting present demands, although the mechanism of the internal process of satisfaction serves the demands of the objective life, the future. The dynamics of the search after possibilities to reach the desirable future, as an effect, is reflected in the present, but the character of the present is determined by the past.

3. The psyche functions by a special mechanism, the conditioned reflex system, i.e. the direct and indirect social connections. The social rules from the beginnings of ontogeny are built into the internal functional processes so that the conditioned

reflexes are built upon the unconditioned reflex system, through the adults of the environment.

4. The two systems, the functions of the unconditioned and conditioned reflexes, remain in close connection in the course of life, in spite of the fact that sometimes and in certain dynamic situations one or the other becomes dominant within the personality. So they may seem to be independent. Under such circumstances the one may partially be blocked for a period of time as a result of a conditioned reflex function of inhibitory character. It may also occur that the influence of some too intensive stimulus releases the potential predominance of one or the other reflex function interference-like, manifesting itself in processing and the response to the stimulus.

5. When interpreting the reflexes concerning the psyche, the view of Anokhin is accepted against that of Descartes. According to that view, reflex arcs, reflex chains, and reflex rings constitute interconnected complex reflex systems.

6. Only the final result of the human reflex process, the response can be recorded by an outsider. The whole mechanism can be explored or followed only with complicated methods, by conclusions drawn from the response. Exploration is hampered by the fact that the end of the original primary reflex arc is the source of stimulus for the next link in the chain of internal processes. This occurs in a complex reflex process and the totality of the parts which can only be under-

stood through transmissions. This is the only way to detect the original stimulus and to explore the complicated processes of the internal function of stimulus and excitement and its relief by a response, and the activity of reflex system and the linking of its parts. The factors determining the behaviour of man cannot be understood without their knowledge.

III. THE PERSONALITY: INTERCONNECTION AND INTERDEPENDENCE FORMED INTO A SYSTEM

When observing directly the interconnections of psychic and somatic factors, it must be stressed that interconnections of the human psyche and the somatic organism, the close connection and interdependence of their functions, are realized in the development and function of the human personality and its manifestations towards the external world. If the determinants and the functions of the personality are studied, the connections of the somatic and psychic factors can directly be explained.

The personality is the determinant unity of the morphological components of the individual, the functional form of living life, of the mentality, attitudes, manifestations and activities of the individual, that makes him unique in the social community where his personality has developed and in which he actually lives.

When examining the personality, the individual's somatic development

and function and psychic development and function cannot be separated. The two features form a unity, they are closely connected and depend on each other in the course of individual life. They form a unity in individual development and in all functions. The personality is not only the totality of the individual psychic and unconscious psychic characteristics, but it comprises the general human and individual characteristics of the somatic organism as well. The human personality is a special, individually regulated entity of all morphologic and functional qualities of the individual within the frame of general human characteristics. It is this entity in which the somatic organism and the psyche are interconnected. The processing of stimulus-excitation-relief occurs into the somato-psychic and the psycho-somatic direction.

In order to understand these interconnections it is indispensable to determine the function of personality. The personality reflects the attitude of the individual towards the external world (subjects, structures, persons, individuals, groups, "other people", cultural heritage) on the one hand, and towards his own internal world, i.e. his soma and psyche to his present, past (world of memory) and future (object of life) on the other hand. It comprises and integrates the form, intensity and nature of the somato-organic and psychic stimulus-excitation processes elicited by external and internal stimuli (information); and it comprises the integrated forms of processing, of excitation processes

elicited by diverse stimuli. It is also the personality which emanates the results of the integrated results of processes towards the external world. The latter includes the characteristic external responses to stimuli and the individual characteristics of the intensity and nature of communications towards the external world.

The function of personality involves in addition the possibilities of modification of the previously developed personality form and content through feedbacks and internal evaluations, i.e. in the frame of self-development.

The personality develops and changes in the course of individual life. Use of the term personality is therefore incorrect for designing the unity of attitude, behaviour and manifestation of a mature adult individual only. What should then be called the manifestation entity of the infant, young child, and adolescent when it is evident that there are individual differences in the fetus, newborn, infant, young child and adolescent, too. Individuals in all these phases of life have their own unity of attitude, behaviour and manifestations: they are unique and have a personality. We therefore separate the personalities of the different phases of life and call actual personality the personality of an individual in the given phase of his life.

The actual personalities of different life phases are built upon one another in the course of individual development. The actual next one develops from the previous one, and so the consecutive personalities follow one

another and are in close connection. The difference between them consists in the progress of information processing with age.

The progress of processing information, the quality and quantity of the processed contents in a given period and the connections of these contents; the sequence and form in which these connections are built up one upon the other constitute the course of human personality development. This development must be favourable, since the external world including other people and more or less the individual himself, judge a man on the basis of the manifestation, behaviour, attitude and actions of his personality in every phase of life.

The two basic systems in the individual, self-development of the soma and the psyche are subordinated to the development of the whole personality. Whether this relation of the two systems will be dominated by the soma or the psyche, depends on the stereotypes developed previously.

In the course of individual life a persisting personality structure develops through the function of remembering-forgetting. The personality structure is, corresponding to the rules of cybernetics, to be regarded as a functional structure. This is essential, as the interdependence of somatic and psychic factors and the function of the personality can only be understood if the personality is interpreted not as a strictly static construction, but as a dynamic functional system reacting upon itself and manifesting itself.

Within the personality structure several structural elements and partial functional unities exist. They are the vegetative, the kinetic (motor), the intellectual and the sexual personality elements. They all have complicated connections to the other ones. These specific personality elements each represent energy extension fields within the dynamic system and at the same time partial functional unities for preparing and for processing and solution of certain special tasks. It depends on the stable or actual character determined by the interconnections of the structural elements of the personality, whether an excitement elicited by a given stimulus will be concentrated or fixed during its processing in one of the elements within the structure and will be dominant in the response, or, on the contrary, the direction of the response, and the internal direction of processing mechanism will correspond to the balance of the personality. This means that the nature of the response to a given stimulus, i.e. the direct somatic process developed under the influence of the stimulus, and the motions of the material, the functional changes caused indirectly by a psychic process, and behaviour, attitude as well as activity all depend on the dynamic-energetic connections between the elements of the personality structure, and on the stereotype developed previously.

Thus, manifestations, attitudes and activities of the individual are phenomena representing the resultant of forces of the functional unities of

which the personality structure consists. As a consequence, the internal movements determining the actions, behaviour, attitude and manifestations representing the everyday somatic processes and the psyche of man, and the energy transfers within the structure, are of two directions within the whole personality: the internal movements determining the response, and the results of energy transfer are of somato-psychic domination at one time, and psycho-somatic at another time.

I shall not quote case records to illustrate the psychic events arising under the influence of stimuli starting primarily from the somatic organism, or of somatic phenomena elicited by primarily psychic effects. In previous papers we have reported on observations, the reality of which has been proved by the success or failure of treatment. These cases showed that psychic changes in the personality can be elicited not only by grave and sometimes lethal somatic illnesses, but the younger the patient, the more do comparatively mild somato-organic functional disturbances (dehydration, acidosis, retention of certain materials in the body fluids) affect his psyche in a temporary or lasting manner. Secondary functional disturbances and complaints of physiological character may arise in nearly all somatic systems under a continuous psychic influence, and after lasting functional disturbance some tertiary morphological changes may develop.

Not only somatic and psychic factors continuously affect each other

within the personality; everyday processes also do so. The psychic effects of gastrointestinal function are well known. A pleasant dinner made up of favourite dishes of the individual will cause an euphoric state, even without any spirits. And, if we only think of our favourable dish, salivary secretion starts. Similar examples can be taken from the field of sexual life. The psyche is activated in partner search on the basis of an increased hormonal release and, on the contrary, if the individual thinks of his partner, which means a merely psychic stimulus, the same hormonal process starts in the organs as if the individual had in fact met the partner, as if a natural stimulus had affected him. These are examples of complicated somato-psychic and psycho-somatic processes with complicated interconnections. When e.g. a susceptible person has had a substantial dinner, his stomach becomes overfilled, his diaphragm pushed up and his heart is dislocated upwards and to the left. This abnormal situation of the heart may affect the coronary circulation, causing the symptoms of angina pectoris in the somatic organism. If there is fear of cardiac death in the conscious element of the individual's psyche, the sensation of the symptom mentioned above is stimulated in the conscious, causing an increased fear of death and eliciting anxiety in the emotional sphere. This anxiety as a psychic stress sets in motion a distress process, as a result the coronary disturbance increases, resulting secondarily in serious psychic angina pectoris, and without

due intervention the vicious circle may cause not only functional but also morphologic disturbances of the heart.

In this way, processes of psychosomatic direction involving sudden anger, fear or joy may lead to changes in the circulation of blood, in sweating, in the rhythm and depth of breathing, or may elicit urination or defecation.

As to the mechanism, by which the somatic organism and the psyche affect each other within the personality, it must be taken into consideration that the humanization of vital processes in modern individual life, the socialized humanization of vital processes is the key to the development of personality. It is essential for this humanization that the unity of the biological and social formations of man be realized in the personality in the course of individual life.

Human vital processes are direct and indirect reactions. It is characteristic of the living organism that if it is affected by a stimulus exceeding the excitability threshold, an excitation is stimulated in the organism. This state of excitation cannot be maintained permanently, it must be relieved, since the organism must regain its characteristic internal state of balance (homeostasis). The relief of excitation is a response to the stimuli processed internally. The stimulus-excitement, the processing ending in relief, including the nature of the processing system and the relief (action), are reflected in the vital process.

Human life is, of course, not a reaction to single stimuli, not a single response, either quantitatively or qualitatively. It is a number of reactions and responses, sometimes groups of them built up in a complicated way, being effective in an indirect and interwoven manner. Stimuli eliciting excitement in man may start both in the personality and in the external world. Both internal and external stimuli may be of natural, objective character or signals of abstract character, brought about by man.

Objective stimuli, those of natural character, elicit a response, once their intensity has exceeded the threshold. As to the stimuli of abstract character, it is a characteristic of man, in which he differs from any other living organism, that he creates abstract signals, using the created and learned signs for indications and can understand and perceive an abstract signal as a stimulus may be equal to that of objective natural one, which may have been the basis of the signal abstracted by man in general long ago.

The personality perceives the internal stimuli of natural character, the demands through interoceptors. These are parts and results of actual physiological or pathophysiological processes. Internal stimuli of abstract character derive from sources of stimuli such as thinking, evaluation, raving, perception-emotion, appearance in the memory, i.e. from the world of memory in the broader sense of the word.

External stimuli come from nature and society, and are received by man

through exteroceptors. While stimuli of natural character originate from the environment, stimuli of social character may come directly from the society, and indirectly from the history of mankind and the heritage of culture and civilization. All these social effects are transferred in the form of sources of stimuli from other people, either directly from persons, or indirectly through activities like writing or reading. In possession of a certain knowledge, man seeks them as sources of stimuli.

Human life manifests itself with a diversity of stimuli, in complicated chains, rings, complexes of somato-organic, psychic reactions linked openly or in a concealed way.

SOCIALIZED HUMANIZATION OF LIFE PROCESSES

To clarify this issue, it is necessary to repeat the interpretation of reflex processes, where the term reflex is not used in the sense as Descartes did it, but according to Anokhin. Reflexes are events activated by effective stimuli. In the course of man's development, reflex arcs, reflex chains, reflex rings and complex reflex systems arise. They are closely interconnected through somato-psychic and psychosomatic functions. As to their nature, they can be divided into two groups, viz.

a) reflex forms of physiological character,

b) reflex forms of psychological character.

The physiological reflex forms are

- a) inherited unconditioned reflexes,
- b) acquired Pavlovian temporary conditioned reflexes, and
- c) acquired definite reflexes relating to individual life.

Among the reflex forms of psychological character, there is no inherited unconditioned reflex. These reflex forms are conditioned ones, acquired in the course of individual life. They can be divided into three groups, viz.

- a) acquired classical Pavlovian temporary conditioned reflexes,
- b) acquired definite conditioned reflexes of the individual's life,
- c) complex reflex forms, suitable for creating new responses; we term them creative response.

These forms are internal processes (partial functions, systems of partial functions), which mean not only the continuous mechanism of personality function, but also the mechanism of socialized humanization.

Within the function of the personality as an entity, the function of one or the other of these reflex forms dominates in the individual, corresponding to his age and level of development. In the first ten days of life, only the inborn unconditioned physiological reflexes are functioning. The classical Pavlovian vegetative-somatic physiological conditioned reflexes (vegetative, visceral, motor, perception) are built in into these unconditioned reflex processes with events of feeding and somatic nursing. Later, after the 6th–8th week of life, the emotional, i.e. conditioned reflex-func-

tions of primitive psychic character are built upon the previously developed reflexes, and fixed under the influence of life with the mother or her substitute. Later in infancy, after 6 months of age, and gradually in childhood and adolescence, or under unfavourable circumstances only in adulthood, the acquired unconditioned reflexes of psychic character are continuously built in into the personality function. Especially the creative responses, as the most differentiated partial functions of psychic character, are important among the reflex processes.

Speech, learnt with the help of adults, is of great importance in the development of reflex forms of high-level psychic character. This includes the understanding of words and speech, and learning to signal by means of words and speech, later in childhood, being acquainted with letters, learning to read, write and count, and being able to use these functions for giving and receiving signs. The basis of the development of these high-level psychic functions are the understanding of sounds as primitive signs, the understanding of daylight and darkness, learning to seize with the hands, creating means of subjects, standing and walking, and, parallel with these, understanding the meaning of actions by the help of adults.

The adults of the environment influence the internal process, and the totality of the result of this process leads to the socialized humanization of the vital processes of biological character through reflex functions of

high-level psychic character. The social meaning and evaluation of the vital processes are handed over, built in by words, writing, and signaling, programmed into the functional system of the personality of the young impressionable individual. The programme becomes definitive, if the individual accepts and identifies himself with these effects of the adults in his environment and he builds in the manifestations into his system of interpretation in the form of an irresistibly directing stereotype.

The abstract world of signs becomes an equivalent source of stimuli with the natural phenomena of life and with the world of external objects. So the abstract signs may elicit an excitation equivalent, excitement with the letters and should also be relieved.

Knowledge of the internal stimulus-excitement-relief process preparing the kinetic response helps to understand the interconnection of the somatic organism and the psyche, the mechanism of the socialized humanization. A simple example will suffice to point out the essence of interactions. A young girl goes to a party. As the room is hot, an unconditioned stimulus-excitement process starts under the influence of the high temperature and beside other phenomena she begins to perspire, especially in the axillary region. The process would have no consequence if the girl were alone at home, but at the party where she desires to have success, if she becomes aware of the intensive smell of her sweat, this starts a conditioned

reflex process in her psyche. She believes that her friends will smell the unpleasant odour. This thought of fear of failure is elicited by primary somato-organic factors. The conditioned reflex chain in her conscious elicits anxiety in the emotional sphere. She is worrying about being put to shame, being ridiculed, and she becomes disappointed. Anxiety, a psychic distress, reacts upon the somatic organism and instead of being stopped or relieved, the perspiration further increases. In this example a primary somato-organic unconditioned reflex process was the stimulus, which started a psychic process.

The direction of the interconnections can also be opposite. Let us take a young man who participates at a contest of gymnastics. He feels an eagerness to compete in his psyche, this means that he is anxious to score a success. The anxiety, a primary psychic distress process, increases the activity of the sweat glands and makes his palms sweat. The conditioned reflex process is followed by a further chain-reaction. The competitor knows that his hands may slip and therefore makes mistakes in the exercise, endangers his success in the competition, he will be disappointed and will fail. These psychic factors are further stimuli (effects of distress) to the somatic organism, and the perspiration is increasing further. The above two examples show convincingly the pattern of interconnection and interdependence of the somato-organic and psychic factors on a previously established stereotype.

These examples will help to understand more complicated somato-psychic and psycho-somatic processes of different directions. The fact must be borne in mind that everyday life cannot be compared to that of a test animal. People do not live in sound- and light-proof, air-conditioned laboratory rooms, but in open social and natural environments, where their personality is developing and where there are developed adults, and all stimuli including the teaching and education by adults, are processed in their specific individual personality by their specific evaluating system. The stimuli of natural and psychic character, i.e. the effects eliciting excitement, become equivalent. Thus, the natural vital processes will be humanized in the way as are the adults of the environment. Parallel with teaching to speak and write, they gradually teach, build in the traditionally developed evaluations of social character a system of meanings generally valid for man, the meanings of good and bad, valuable and valueless, to be punished or to be rewarded and have them accepted by the developing individual. The acceptance of this system of social meanings as a function determining the young individuals' actions, represents the socialized humanization.

The fact, which form of response to a stimulus, to needs and demands, will be dominant in the function of the personality, how the individual responds to the majority of stimuli, and which of the vital processes will be socially humanized, depends on the

factors which have formed the specific life of the individual. A possibility for the functioning of all four reflex forms and forms of response mechanism will persist throughout the life of the individual, while the primordial forms endanger the effectiveness of the younger ones. It depends on complex processes, how effective the socialized humanization will be in the interpretation of vital processes, and in the system of meanings; and also how effective the younger forms of processing and response will be in the direction of the individual's manifestations. It is known that the psyche makes use of a coding system to estimate the meaning of the stimulus before the actual personality begins to function and a kinetic response is given. The key to this coding system are the estimates "good for me" and "bad for me".

The "good for me" and "bad for me" estimates are either somatic or psychic in character. The meaning of the decoded stimuli is different: somatic pain or good feeling, favourable or unfavourable physical conditions. It may be of psychic character, like emotional pleasure, sorrow, pain; or of intellectual character: material, ethic, aesthetic values. As to the nature of the decoded meaning, the most important question is whether it endangers or protects the existence of the somatic organism, or whether it means annihilation, help or support for the psyche.

Even the most sensitive, mature human personality follows the fundamental rules of the ancient living or-

ganism, when processing a stimulus-excitement, or when taking stand in actions, activities, attitudes, i.e. when he responds to a stimulus. The ancient law is: one should escape from the "bad for me" and approach the "good for me". The "bad for me" should be attacked, destroyed; the "good for me" should be kept and protected.

It is not simple to realize the escape from the "bad for me" and the approach to the "good for me" in everyday life and to develop a view concerning action, activity, motion, behaviour and attitude for the complex human personality including his psyche. It is not so simple as for an amoeba: The amoeba moves from the dry place, a "bad for me", towards the wet place, which is a "good for me", thus his choice is based exclusively on chemical and physical effects. The human response to a stimulus, the manifestation of personality, is realized in a complicated chain of transmissions in the form of taking stand, action, behaviour and attitude. There are men who can stand dangerous somatic "bad for me" states, stand physical pain, even death, because the action, activity and behaviour realized in the processing of the stimulus in his personality causes a "good for me" of psychic character, and this kind of "good for me" is considered the most important human attitude and to arrive at it is the object, the sense of life for that man. The complicated transmission can be an opposite one, too. There are men who can endure psychic "bad for me" states,

or an existential annihilation of psychic character unbearable for other people; all this only for the sake of attaining a somatic "good for me".

Clinical experience shows that the younger the individual, the less developed the social humanization of his personality, the more are his manifestations, standpoints, actions, activities, behaviour and attitude dominated by the somato-organic "good for me". The more mature, sensible and complicated his personality, the more do the endeavours at reaching the psychic "good for me" states dominate in the subject's manifestations, actions, activities, behaviour and attitude. In general, the latter form of living life develops merely with ageing. It blossoms out in the phase of development, when not the importance of the age is in the centre of the personality dynamism (function system), but the importance of *I* is included in the importance of *we* together with the importance of *you, he, she, they*. On that level of development *we* takes the most important places in the personality and the "good for us" and "bad for us" instead of the "good for me" and "bad for me" are the keys of coding the interpretation of stimulus. *We* means *I* and *you*, the unity of mother and child on a lower level of development. Later the other members of the family join this unity, and much later *we* includes the totality of people belonging to the communities, working place, country, then mankind and ideas and ideas without any material.

IV. PRACTICAL CONCLUSIONS

The somatic organism, the vegetative soma, one of the two systems constituting personality, develops in a specific morphologic and functional form as a manifestation of inborn characteristics, programmed genetically in the course of biologic maturation. On the other hand, development of the psyche is strictly dependent on the environmental effects surrounding the individual after birth. The psyche develops during ontogeny while living; acting with the people in the social and natural environment in the course of internal processing is induced by actual effects: stimulus-excitement-relief (emotional, ideal, action). The form and content developed are definitely the result of environmental effects. Of external effects, the evaluation of persons emotionally close to the individual are important for him and his actions. The conclusion for doctors and educators is that the characteristics of the somatic organism programmed in phylogeny cannot be altered at will under normal circumstances. The only thing that can be done is to strengthen the favourable somatic qualities and to suppress the unfavourable ones. In contrast, in the psyche the characteristics programmed during ontogeny can be altered with the help of feedbacks and the development of unfavourable characteristics can be prevented. In order to apply this in practice one should consider the methods to be used and remember that immediately after birth the

individual is merely biologic in character and later the extra-uterine maturation process follows biological rules. In the early phase of life the dominance of somatic factors is characteristic. Through them, the environment may influence the individual. Thus, the methods of education in early age are concealed in the mode executing the everyday activities of nursing and feeding. Since the life of the individual starts and continues in a social frame, one must consider this when choosing the methods of education. Immediately after birth through the mother and other adults, then indirectly through different institutions, social effects of psychic character start to develop, to form later the functional system called psyche. Parallel with ageing, from fetal life through infancy, childhood, school age, adolescence until adulthood the role of the increasingly developed psychic system is increasingly established within the personality. In order to ensure appropriate progress in the personality from the point of view of both the individual and the society, it is essential that factors of psychic character, educational environmental effects should increasingly dominate beside the effects of nursing, feeding, and the other activities of physiological character, before reaching adulthood. In the consecutive phase of life the internal powers which dominantly direct the vital processes of the individual, also undergo changes. While in the earlier phases of life it is the emotional personality element which has the directing function, in

the course of development the intellectual personality element gradually takes charge of the functions of the system. Under normal circumstances the intellectual character of the psychic effect dominates in the interconnections of the somatic organism and the psyche of a properly developed adult personality. Accordingly the methods of education should contain more and more psychic elements (teaching of verbal character) gradually increasing the load with the prog-

ress of life. In addition, education should strive at ensuring the dominance of conscious elements among the psychic ones in the interconnections, considering expectations, needs and demands of modern society. In order to achieve this aim, both the individual, the one who is educated, and the whole society, the environment and the educators should make every effort to observe one another's points of view.

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