

## Some Stress Aspects in the Human Organism

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### Abstract

In the human organism, the stress is a perturbation. The existence of the perturbations imposes a permanent control of the way the exit size is realized, so that any deviation can be corrected. Stress represents a normal reaction of the organism which appears as a response to an aggression situation which requires an unusual and quick adaptation effort from the organism. Stress is a state of putting in alert, of mobilizing the forces of the organism in the occasion of an event which requires, in order to be kept under control, a big amount of energy in a very short time. This alert state or action preparation translated through physical and psychological manifestations. Psychological stressors are those which come into being independently from the man's will and destroy – as social factors – psychic and organic components taking place in the response, the organism consequently get tired. During the harmonic life gradually all human psycho-organic components shall get exhausted. During the individual evolution, the immediate vicinity imparts the codex of the principles of the moral motions. This is also a matter of opinion a kind of scale of values, more one can say it is very favourable for the individual from the healthy-spiritual point of view, because they are hardly touched by the negative effect of stress usually people beyond the pale of the society, in straits to the periphery. The physical discomfort feeling with the concomitant psychological reaction is realized by the measure of the personality's sensitiveness. The modeling method in biophysics consists in the negative inverse connection

**Key words:** stress; emotion; biophysical modeling; negative feedback

### Psychosomatic Aspects

The research and application field of psychosomatics, due to the new interdisciplinary aspect has been developed to a new trend. It searches and treats the human physical and psychological symptoms in their connection and by settled common features, psychosomatic and somatopsychic correlations has been established because of their various etiology which is of primary importance in creating symptoms. In 1936, Hans Selye published his article on stress in *Nature*, in which he discussed the close correlation between stress, and the endocrine and immune systems [1]. In his book entitled *Stress without Distress*, Selye states that he had been preoccupied with the adaptation of the living organism to stress for nearly four decades [2]. Indeed, the guiding principle of his stress theory can be traced in most of his works, and the name of Selye was coupled with the concept of stress. Stress is the non-specific response of the living organism to a stressor. Such stressors include effort, focused attention, pain, illness, failure, joy, success. Stress can be either pleasant or unpleasant, whereas distress always denotes something troubling and unpleasant. Although the natures of the stressors may differ, similar physiological/biochemical changes are produced [3].

It deals of course with genetic factors, too, built into the person's environment, into its involved effects which makes this aspect mutually unambiguous interactive. As far as sicknesses are concerned the loosened homeostasis takes place on the basis of bed, deficient or weak adaptation caused by outer environmental effects: the different neurotic disharmonies, high blood pressure and its circulatory and organ consequences, gastric and duodenal ulcer, articular and rheumatic complaints, renal illnesses, asthma, allergies etc. In such quality and enlightening, resp. each of them can be appraised as independent, adaptational illness [4].

The biological stress is a long succession of active, interactive mutual effect. This relation which always consists of the difference of value-power-intensity is, like an example of today, a chain of action of two fighter during which they get the offensive and defensive conduct in exchanged role. The fortune is also changing, the winner prevails but the victory's price is that he must use up suddenly more of the given adaptative reserve than with the soft harmonic balanced daily conduct. Every struggle induces a biological change. It is most often still a reversible state and apparently will be equalized through different compensatory processes. As psychological stressors there are of significant

effect: losing a person or the danger to lose him, the loss of a thing, wounded, injured person, life-danger, threatened state, protracted injustice, legal delay of jurisdiction, precariousness of existence, isolation, overtax of information, sensorial deprivation, leading role or high rank hanged upon an immature personage.

Psychical stressors are those which come into being independently from the man's will and destroy – as social factors – psychic and organic components taking place in the response, the organism consequently get tired. During the harmonic life gradually all human psycho-organic components shall get exhausted. My interdisciplinary aspect suggests me that some greater stress or protracted negative circumstance invades the weakest organ of the body and the interaction the uniform chainreaction within the organism and its co-operation loosens. In this unbalanced health condition intervene compensating processes but their efficiency varies by organs [5]. Whilst in the first case ensues harmonic organ and psychical aging in the second case, on the other hand, a stormy struggle between the organism and the psychical defence?

The similarity between the symptoms of the somatic diseases and those organic ones caused by psychical tension is misleading. The reactions of the organism, its reaction capacity, the general capability of resistance exert influence on consciousness of the disease and its course. To the mental shock it is generally typical the psycho-somatic change [6]. It is a disease from the point of view of the person and the physician alike in this appeared formation – because the internal regeneration to bring about or restore an equilibrium is a fruitless attempt - the diseased condition has been elicited about whether by corporeal or by spiritual stress, it needs already external medical intervention.

### Emotional States

During the individual evolution, the immediate vicinity imparts the codex of the principles of the moral motions. There are such social straits where stealing, cheating, swindle entails positive-value judgement – esteem when not the „gatherer” is the loser, i.e. the members of the group are taboos but everybody else is a prey for them [7]. This is also a matter of opinion a kind of scale of values, more one can say it is very favourable for the individual from the healthy-spiritual point of view, because they are hardly touched by the negative effect of stress usually people beyond the pale of the society, in straits to the periphery. Another grouping is also particularly faced the reactions triggered off by the stress or rather they are insensitive to their effects, these are the mentally deficient, in everyday use „the event won't reach their mind” [8]. The deficient, in everyday use brought about threats, frustration so their conscious, subconscious treatment should be combined with a defense mechanism.

For want of experience of moral norms, it is the aggregate norm of the „patients' community” decisive – for example in the case of personality disturbances, psychopaties – and this is why they have no insight into the seriousness of the criminal act committed. They don't show any regret because psychiatric patients are engaged with their internal imperatives and are closed towards every kind of external effect.

Any news or sight as sudden stimulus gives rise to a powerful stress in the individual. The effect means an immediate and intensive reaction, for example news of death accident, outbreak or suppress of a revolution, reprisal, execution-auction, judgement etc. In such cases the intensive emotion is of hot tempered. Everything becomes of more vigorous appearance: great fear, evident dread or deep desperation follows [9]. Subcortical regions get activated, depressing the conscious actions which are, therefore, instinctive, ill-considered of impulsive character. In such cases you should hear as project action „I will kill him/her”. More moderately or with temper to decrease, the killing intension is turned into a confused expression, „I'll take vengeance against him/her” which

denotes to get calmed but not to give up the intention. This period in reality turns into a cathartic experience by elaboration of the manners to work out tactics and as an efficacious defensive mechanism it helps to treat the shocking event.

### Phase Delay, Quasi Emotion

The experience of a state may happen again by recall resulting in the same emotion. The following declarations can be quoted as examples: „I feel to be afraid of ... I have to take flight; I've got terrified but I'm not frightened”. Although the stimulus eliciting a real emotion is absent we may experience a true emotional reaction. In this way one can perceive the effect of the negative impulses even without subjective sense of fear.

The subjective emotional experience of a person got over a series of negative effects is sometimes weaker at some other time becomes hot-tempered, this being a mentally negative emotion. The experience „so as if” may be embodied as an affective phenomenon which can be involved but then in fact we don't feel it. The introspective experience in the person straits organic emotive (psycho-physiological) mechanisms without the effect of the real intellectual experience, for lack of the provocative experience of the emotion [10]. By this way the retarded emotional reaction can subsist which influences the somatics, however, is not in an excited state. Hence, the individual is able to reproduce the emotion-inducing situation with the adequate reaction. The person got over the wartime events who was in the isolation of the confinement, a fighter... revives again the negative experience, another time perhaps it will be commented „without sentiment”, yet after a while there arises such a powerful affective-impulsive state (by self-excitement) which originates irreversible changes in the organism. We may explain it in a way that the description of the emotion has activated the situation, every organ taking part in the situation and a quasi-healthy person lives apparently real subjective emotions through. The person who, for the moment, has no overlook to the psycho-physiologically activated state, has no cognitive explanation, tries to insert somewhere his state. The cognitive factors being effective determinants of the emotional states, the formed physiological status is manifold identifiable depending on the momentary calling type stimulus [11].

When we pass over a trauma numerous parts of us are involved, that is a global attack on the organism both emotionally and organically. There after it is fixed in the memory of all sorts and if the calling type stimulus addresses but one of the countless traumatized, every area in its purview or in the vicinity will also be stimulated, that is activated. The subject cannot live through the state of the emotions without cognitive activation, so we are unable to recall the space-walk of the astronaut, his tumble, soaring flight, weightlessness, isolation when these did not take a part in our emotional life as antecedents.

Probably there exists between centers a mutually stimulating and impeding process and feed-back mechanism, resp. which functions also organ-specifically, e.g. the fear-containing stimulus activates the fear-center. If the activation of this centre takes possession on the person it can happen that the stimulus is strong enough that it doesn't perceive emotions of smaller intensity. Stronger experience performs impeding function, as an example that person who recalls his imprisonment meanwhile he does not fell the petting.

The attack against life is an aggression which provokes the most ancient fear. If the fear is undifferentiated and it is present as an anguish without any object then the healthy man goes through an ethical conflict simultaneously: he responds to stimuli according to his momentary feelings or diminishes his sentiments artificially [12]. Both cases are pseudo-solutions. In the background of the experience of the trauma there exists a stimulus as a hidden, diffuse, vigorous anguish, the response-reaction, the result of which does not succeed to avoiding sanction,

sometimes presents oneself as a specific emotional-cognitive condensation („I don't know why has it been done", „How had I strength to do it?"). This observation supports the relationship anguish-stress.

The state of anxiety and the change of cardiac rhythm can be marked by the significant rise of the blood pressure in stressed situations. For healthy people, the anguish-rising, harmless situations result in intensive vegetative reaction. A person, on the other hand converted into who has turned hypersensitive replies to whatever exciting event by hyperreaction. The generalized, indiscriminated reactions provoke strong vegetative discharge which means the transitory „fail" of the internal autonomous signal system. The autonomous hypersensitivity may result in similar behavioural phenotype. There proves individual difference in the capability to distinguish between experience and other subjective conditions.

The somatic sickening stress induces local and generalized reactions. All these pass off on physiological-biochemical level in the organism. The physical discomfort feeling with the concomitant psychical reaction is realized by the measure of the personality's sensitiveness. Discomfort induces tension the measure of which is personality-dependent, there originates the awareness of disease in a sensitive, distressed individual.

### The biophysical modeling

With modelling we usually understand the reproduction of the behaviour of a system on an analogue one especially built on the basis of certain rules. Usually, the system is modelled either on a physical one, either on a mathematical one. The mathematic model has the advantage of comfort and economy. The mathematic dealing mode also eases significantly the discovery of the analogies between the various systems [13].

Generally, for the study mode of the biophysical systems, two methods are foreseen: the phenomenological methods and static methods. The phenomenological method studies the phenomena regarding a few fundamental principles that result from various experiences, leaving aside the discreet internal structure of the matter.

The statistic method studies the phenomena starting from the discreet internal structure of the matter. For the study of the systems with an enormous number of particles the probability calculation is used. Hence, the measurable macroscopic properties appear like average statistic values of the properties of the individual elements [14].

The modelling method in biophysics consists of the creation of certain devices (models), with which processes analogue with those happening in living organism are studied. The biophysical model though abstract reasoning leads to models of the phenomena which by simplifying and isolating some aspects of the phenomena, discover laws and relationships which describe with a certain approximation the behaviour or functioning of bodies or biological ensembles.

In the human organism, the stress is a perturbation. The existence of the perturbations imposes a permanent control of the way the exit size is realized, so that any deviation can be corrected [15].

The negative inverse connection functions "constantly" and its main role is, to maintain certain functional parameters of the body to a relatively constant value. This is about a relative stability, since the adjustment involves oscillations around an abstract medium value with a tendency to minimize the deviation in respect of this mean value [16].

Let's denote with  $\mathbf{o}(\mathbf{t})$  the exit output and the mean value of the characteristic parameter on the system is  $\mathbf{o}^*(\mathbf{t})$ ; after the adjustment, the values of the outputs obtained shall be denoted with

$$\mathbf{o}(\mathbf{t}_1), \mathbf{o}(\mathbf{t}_2), \mathbf{o}(\mathbf{t}_3), \dots, \mathbf{o}(\mathbf{t}_n) = \mathbf{o}^*(\mathbf{t});$$

$$\text{if } \mathbf{t}_1 < \mathbf{t}_2 < \mathbf{t}_3 < \dots < \mathbf{t}_n.$$

We talk about a negative inverse value, if the following two conditions are satisfied:

$$|\mathbf{o}^*(\mathbf{t}) - \mathbf{o}(\mathbf{t}_1)| > |\mathbf{o}^*(\mathbf{t}) - \mathbf{o}(\mathbf{t}_2)| > |\mathbf{o}^*(\mathbf{t}) - \mathbf{o}(\mathbf{t}_3)| > \dots > |\mathbf{o}^*(\mathbf{t}) - \mathbf{o}(\mathbf{t}_n)|$$

$$\frac{d|o(t_i) - o^*(t)|}{dt} \leq 0.$$

In the living organisms, all the mechanisms for maintaining a constant composition and internal environment function on the basis of on negative feedback.

Certain stressors according to some experts don't involve any danger, e.g. cascadeurs, cave divers, mountaineers, rock-cragmen, astronauts, all of them are in life-danger any minute. Also explorers and sometimes also researchers belong to this category taking completely unknown ways because every steps is unforeseeable and can be a source of danger but they undertake all these upon moral discovery consideration [17]. The motivation of the personality is as strong as to inhibit the negative effects. Interestingly, the aggression as doing justice rightfully is not a stressogenerous source. With a simple personality taking the law into his own hands breaks forth like thunderstorm, in its spiritual counter-type the frustration gets elaborated, the rightful aggression is converted into objective and personal enmity where the lawlessly offended loser waits fill his victory. The negative person rarely gets squeezed to the periphery.

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