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Gac Med Mex. 2017;153:124-32

Conceptualization of the disease and some of its designations: The contribution of a comparative etymological study

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Abstract

Every cognitive process, including the conceptualization of some perceived facts, such as human disease states, entails both an emotional as an evaluative aspect. Regarding this, cross-cultural research has shown that there are common human value contents. Therefore, in a human phylogenetic context, it is plausible to argue that, along with the development of our language, both the hetero-perception and self-perception of some specific human states have been termed descriptively to communicate their adaptive significance. This is the case of those human states whose properties have been conceptualized, with the corresponding evaluative emotional component, as "disease". Since names are the symbols of a language that designate any type of object, either perceptual or conceptual, reviewing the etymology of terms related to "disease" could be a contribution to its elucidation. In consequence, some equivalent terms to the Spanish word enfermedad were reviewed in various Indo-European and non-Indo-European languages. From the analyzed denominations we can conclude that the different words have described the perception of human conditions as weak, evil, suffering states, etc. Therefore, there is a denotative concordance with the diseased human states in the revised cultures. (Gac Med Mex. 2017;153:124-32)
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KEY WORDS: *Disease. Concept of disease. Designation of disease. Etymology. Indo-European and non-Indo-European languages.*

Introduction

Cognitive generalization processes (abstraction) allow for us to transcend currently perceived facts and project ourselves, by integrating things already known (memory), to a possible development. By means of both generalization of the common properties of a perceived fact and their communication, our knowledge can be expressed by means of a language. But every cognitive process, including the conceptualization or generalization of some perceived facts –such as human diseased states– entails an emotional aspect[1]. In addition, every evaluative process related to a fact, especially a social one, is based on cognitive-emotional processes. In this regard, values are often understood as the criteria human beings consider to select and justify our behavior, to evaluate the others and ourselves, to assess events in general and to make decisions[2-4]. Although each individual has a hierarchy of values, cross-cultural research has demonstrated that there would be general and common value contents, such as freedom, power and attainment of goals[5-8]. Indeed, except in some pathological human

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Date of modified version reception: 23-08-2015
Date of acceptance: 24-08-2015

conditions, it can be proposed that there would be a common value-related basis or foundation in human behavior that would be correlated with the reward activity of our neural system[9]. Although our central nervous system is plastic, especially the neocortex, there are common connective neuronal patterns in our species. Indeed, activation of some human neuronal systems has been able to be determined as being related to both evaluative processes in general and to motivation, reward and decision-making processes (prefrontal cortex, amygdala, nucleus accumbens and ventral tegmental area, among others)[3,10-16]. Based on the above, and within the context of our species phylogeny, it is plausible to propose that, together with the development of our language, both hetero-perception and self-perception of some specific human states have been descriptively named in order to convey their social and general adaptive importance[17]. This would be the case of those human states, the properties of which have been conceptualized, with the evaluative-emotional component characteristic of this process, as disease (in Spanish *enfermedad*).

Given that names are those symbols of a language that designate some kind of object, either perceptual or conceptual, the review of the etymology of some terms related to the generalization of those properties of some human states that in Spanish have been denominated *enfermedad* (disease) could be a contribution to elucidate these states' conceptualization. However, prior to the etymologic approach that will be carried out with regard to some terms that designate the concept of "disease", some basic clarifications are required.

Language, native tongues and etymology

In broad terms, a language is considered to be a system of signs, either natural or conventional (symbols), that enables both the development of thought and communication among those who use them. Indeed, the highest importance of every language lies in the fact that it enables the communication of some states of the social or general real known world. In this regard, every sign belonging to any language is perceptible by some sensorial modality. For example, although natural signs are not agreed human cognitive creations, they are perceptible facts that indicate something[18]. On the other hand, symbols are agreements that have allowed for us to link real-material perceived things with conceptual constructs. In brief, symbols enable the designation of concepts or denotation of facts about things. The former are known as designative symbols, whereas the latter are denotative. Although the cerebral mechanisms that enable the formation of symbols are not known, symbolic language is proposed to be characteristic of our species[19-21]. Among the symbolic languages, historical languages have stood out, which correspond to any of the different tongues that have emerged throughout the history of mankind, and that are used for quotidian purposes. In this regard, more than 6800 different languages are estimated to exist in the world[21-24]. Although languages can be classified in different ways, the most accepted classification is based on the descent from a common ancestral tongue. One of the ancestral tongues is Indo-European languge, where most languages of Europe, Iran, Afghanistan and other Asian regions come from. Traditionally, it has been assumed that Indo-European language would have emerged in a region located between Europe and Asia, about 5000 years ago[24-28]. Indo-European population migration processes, possibly driven by adverse climatic conditions of that epoch, enabled its large geographic dispersion. In consequence, original Indo-European tongue has constituted most part of the languages currently spoken in the world[29]. Indo-European tongue-derived languages include, among others, Greek, Germanic languages (such as German and English), Indo-Iranian languages, Balto-Slavic languages and Italic languages (Latin, Spanish, French, etc.)[25-27].

With regard to etymologic studies, they would have acquired great importance in ancient Greece. In this respect, the term *etymology* comes from Greek *ἐτυμολογία*, a word composed of ἔτυμος (etymo, which means "true, authentic, real") and *-λογία* (*-logia*, the meaning of which is "treatise, study, discourse"). Later, the word *etimología* was Latinized by Cicero (107-44 BC) as *veriloquium* (composed based on the terms *veri* [true] and *loquium* [word]). Therefore, etymologic studies were originally referred to true, real things, to the true meaning. Although currently etymology is understood as being mainly related to the origin of words, it doesn't stop having a link with their meanings[19,30-36]. Based on the above, it can be proposed that an etymologic study comparing some terms that designate the concept of "disease" might be a contribution to further elucidating it. Therefore, some terms that have enabled to designate, in different languages, the concept of "disease" will be reviewed in the next sections.

Designations of the concept of "disease" in Greek, Latin, English, German, French and Spanish

Some terms related to the concept of "disease" will be reviewed both in some Germanic (German and English) and some Romanic languages (Latin, Spanish and French), in addition to Greek. Of the terms that have been used and are still used to designate the "*enfermedad*" (disease) construct, words that are equivalent to the Spanish term *enfermedad* in Greek, Latin, English, German and French will be distinguished. These words are *nosos*, *astenia* and *arrostia* in Greek; *morbus* in Latin; *disease*, *illness* and *sickness* in English; *Krankheit* and *leiden* in German; and *maladie* in French[37-39]. However, there are other words related to the concept designed by the Spanish term *enfermedad*, for example, *pathology* (*patología* in Spanish, *pathologia* in Latin, *Pathologie* in German and *pathologie* in French), which derives from Greek *pathología*.

The etymology of all above-mentioned words on each referred language will be reviewed in the following paragraphs.

Designations of the concept of "disease" in the Greek language

For the designation of the concept of disease in the Greek language, words such as *pathología*, *nosos*, *astenia* and *arrostia* have been used.

With regard to the word *pathología*, it derives from the term *pathos*, which means "suffering, disgrace, emotion, calamity", although, literally, it means "what happens to somebody or something". *Pathos* is a substantive deriving from the verb *paschein*, the meaning of which is "to suffer", and from the proto-Indo-European root **kwent(h)-*, which means "to suffer, to bear, to endure"[32,34,40-42].

With regard to the term *nosos (νόσος)* its etymology is confusing. Some authors state that it would have been used by Herodotus (484-425 BC) and by Hippocrates (460-377 BC). It has been proposed that this word would originate from the negation of **$h_1$osu-*, the meaning of which is "good, in good condition". In addition, this last term is linked with the Hitite terms *ass-* ("being well, being loved, being favored") and *aššu-* ("good, favorable, pleasant"). Therefore, *nosos* would denote an unfavorable state[34,35,41,43].

On the other hand, the term *astenia* is composed by the privative *alpha* that means "lacking of" and *sthenos*, which means "vigor, strength, power"; in consequence, the term *astenia* tells of relationship with weakness[32,34,41,44,45].

Finally, the term *arrostia (αρρωστια)* is linked to the word *eurostos (εύρωστος)*, which means "robust, strong". Therefore, *arrostia* denotes deprivation of robustness or strength, i.e., somebody's weakness[46].

In conclusion, except for the term *pathología*, which denotes human suffering, all the other terms used in the Greek language to designate the concept of "disease", are associated with the general perception of an alteration of human strength and with an inadequate or unfavorable personal condition.

Designations of the concept of "disease" in Latin

In the Latin culture, works were developed where different names related to the subject in question appeared, such as *morbus*, *malum*, *infirmitas*, *uitium*, *aegritudo*, etc. Different Latin poets made contributions related to subjective aspects of the concept of "disease". Indeed, Latin poetry addressed subjects related to love and its unfortunate consequences, linking them to the to the so-called "lovesickness" *(aegritudo amoris)*[47].

With regard to the term *morbus*, it is proposed that this word could be associated with death, since its root *mr-* is linked with the Latin terms *mors* and *moriri*[48,49]. These words probably stem from the proto-Indo-European root *mer-*, which is related, on one hand, to Sanskrit *mrnati*, which would refer to "squash, annihilate, overwhelm", and on the other, with the Greek word *marainein* and the Latin word *marasmus*, all related to "wither, consume, exhaust, extinguish"[32,42,46].

Within the contributions of Latin medical texts to the designation of the concept of "disease", the contributions of Aulus Cornelius Celsus (c. 25 BC-50 AD), Caelius Aurelianus (*fl.* 5th century AD) and Cassius Felix (5th century AD), among others, stand out[50]. For example, in Celsus' work, the use of terms such as *morbus*, *malus* and *uitium* is observed[51]. With regard to the initial use of the words *morbius* and *uitium*, the former was used to make reference to the concept of disease and the latter for a physical and moral defect. However, these terms went on losing ground to the word *passio*, which came from religious language and started being used in the context of medicine to express the concept of disease[49,52].

In conclusion, it can be noted that, in general, the use of Latin terms to designate the concept of disease

went on gradually spreading with time, thanks to the contribution of different writers and physicians. In spite of this, all the referred terms denote conditions of weakening, discomfort (bad shape) and suffering.

Designations of the concept of "disease" in English

In the English language, 3 terms relating the concept of disease are generally used: disease, illness and sickness. However, in some specific contexts, the term "pathology" and, rarely, the terms "morbidity" and "malady", and even less "infirmity" are used[32,41,53,54]. Based on etymologic information regarding the aforementioned terms, each one will be next analyzed by separate.

The word "disease" is composed of the prefix "dis-", which means "without, lack of, opposed to", and "ease", which means "easiness, relief". Therefore, the word "disease" originally refers to a state of discomfort or inconvenience. Note that the word "ease" stems from old French *aise*, which means "comfort, wellbeing, opportunity". This word has been proposed to stem from the Latin word *ansa*, which means "to handle, manipulate", and that it might be used in the figurate sense of "opportunity, occasion"[41,55].

With regard to the word "illness", it is composed of the terms "ill" and "ness". On one hand, "ill" means "harmful, detrimental, bad", but it has other meanings, such as "malevolent, unfortunate, defective and difficult". This word originates from old Nordic *illr*, which means "bad". As for "-ness", it is a suffix that enables to denote "a state, condition or quality"[41,54,55].

The term "sickness" is composed by the words "sick" and "-ness". The adjective "sick" is related to "being unwell or indisposed". The word stems from old English *seoc*, which is related to the Gothic terms *siuks* and *siukan* ("being unwell"). According to some authors, there would be a link between the aforementioned words and old English word *sugan* and old Nordic word *suga*, both related to "suck". Moreover, according to Teutonic mythology beliefs, diseases were caused by suction (of strength, of health, of life?) by demons[41,56]. With regard to the suffix "-ness", see above.

The term "pathology" comes from Greek *pathos*, the etymology of which was already reviewed in previous paragraphs.

The word "morbidity" is formed by the adjective "morbid" and the suffix "-ity". The latter allows for abstract substantives based on adjectives to be formed, and it means "condition or quality of being". In turn, the English word "morbid" is derived from the Latin term *morbus* (see above).

As for the term "malady", it derives from old French *maladie*, which will be analyzed later.

Finally, the term "infirmity", very rarely used in English language, will be addressed with regard to the Spanish term *enfermedad*.

Designations of the concept of "disease" in German

In German, the term that is more widely used to designate the concept of disease is *Krankheit*. The word krank- stems from high middle German, and it is linked to the term *crincan*, which originates in old English, which means "to bend, to yield". It is interesting to highlight the relationship of the aforementioned words with the English adjective "cranky", the first record of which dates from the year 1833 with the sense of "eccentric person". "Cranky" is associated with the term "crank", which alludes to the crank of a hand organ that repeats a melody over and over again[32,55-57]. Although, in German the word *krank* is currently related to "sick", formerly it alluded to "weak", hence the current use of the German words *krank* ("unwell, sick, in pain"), *kranken* ("to suffer, endure") and *Krankheit* ("disease")[58].

The term *leiden* is also used in German to refer to a state of suffering and pain. This word is related to *Leid*, which refers to "pain, grief, bad health". It stems from the Indo-European word *leit-*, which is translated as "to detest, to be angry"[58,59].

Designations of the concept of "disease" in French

The French word *maladie* is derived from the word *malade*, which stems from Latin *male* ("evil") and *habitus* (past participle of *habere*). The term *male* is derived from Latin adjective and substantive *malum*, the meaning of which is mainly related to "disgrace, evil, detrimental things and harmful things". The origin of current French word *mal* stems from old French *mal*, which means "evil, wrong, incorrect"; in turn, it originates in the Latin adjective *malus*, which means "mean, evil". On the other hand, the Latin word *habitus* means "condition, attitude, appearance, clothing", and originates in the past participle of *habere* (related to the verbs to have, to hold and to possess). In French, the word that links to Latin *habere* is the verb *avoir* ("to

have, to possess"), the original meaning of which is to hold and maintain, although it is also related to "skills, that who can be considered for, that who can adapt to". In conclusion, both *malade* and *male habilum* relate to the following meaning: "that who is or is found in bad conditions"[60,61].

Designations of the concept of "disease" in Spanish language

In Spanish language, the word *enfermedad* stems from Latin *infirmus*, which refers to "bodily weakness, weak complexion or constitution, poorness of health". The word is composed of the negative prefix *in-* and the word *firmus*, which would stem from Sanskrit *dhruvah*, an adjective that means "firm, solid, resistant, robust". Therefore, the meaning of *infirmus* refers to something that is not firm, i.e., that is "fragile, weak, helpless"[36,49,61]. Consequently, the main reference of the term *enfermedad* is "physical weakness". Its use would derive from Caelius Aurelianus, who used the term *infirmitas* on his texts[49,52,61,62].

Of note, the Spanish words *dolencia* and *sufrimiento* are usually associated with the Latin terms *aegritudo* and *aegrimonia*, which allude to a state of "affliction, sorrow, sadness, worry", i.e., mental suffering[48,49,62].

In short, the Latin word *aegritudo* is usually regarded as preferably defining a suffering mood and, in contrast, the Latin word *infirmitas* refers to a state of bodily weakness. Since the use of the word *enfermo* (sick) became established during the medieval period, the word *doliente* (in pain), the use of which was mainly related to the word *aegritudo*, was gradually displaced.

As it can be seen by the descriptions with regard to the words in the Greek, Latin, English, German, French and Spanish languages that designate the concept of disease, the common denominator in all of them is suffering, an unwell state (objective and subjective?) and a state of weakness or inconvenience. Therefore, and from a very general perspective, it could be highlighted that, with the terms of these languages, a human state has been denoted where human capacity to adapt to the general surrounding is, to a significant degree, diminished. However, this conclusion could be obvious, since all the reviewed languages belong to an ancestral common language. In consequence, one could wonder about the meaning of those words that designate the concept of "disease" in some languages of non-Indo-European origin.

Designations of the concept of "disease" in some non-Indo-European languages

Among many non-Indo-European-origin languages there is Finnish, Hungarian, Estonian, Aztec, Basque, Quechuan and Mapuche (*Mapudungun*)[63-65]. The terms that designate the concept of "disease" in Basque, Quechuan and *Mapudungun* will be reviewed in the following paragraphs.

Designations of the concept of "disease" in Basque language

Since one of the most important survivors of non-Indo-European languages is Basque, which is spoken in the north of Spain and south of France[66,67], the terms that designate the concept of "disease" in the Basque language will be reviewed. In this respect, both the term *gaixotasun* and the term *eritasun* are used. The fist one is formed by *gaixo* ("sick, poor, unhappy, miserable") and *-tasun* ("quality, characteristic"). On the other hand, *eritasun* is composed by *eri*, which means "in pain, sick" and *-tasun*[68-70].

Designations of the concept of "disease" in Quechuan language

One of the most widely spoken indigenous languages in South America is Quechuan[71]. In this language, the term *onqoy* is used to refer to disease, in the sense of somebody who suffers from or has an ailment. In addition, the Quechuan terms *onqoq* and *onqosqa* are used to refer to "a person who has an illness, who suffers from an ailment". Finally, the term *onqorayay* refers to the suffering of prolonged and incurable ailments[72].

Designations of the concept of "disease" in Mapuche language

Finally, another indigenous American language, the tongue of the Mapuche people (people of the earth), is *Mapudungun*. For Mapuches, as for other cultures, the rupture of natural balance is linked to an individual's both physical and psychological condition, and it is called *kutran*. For this culture, "disease" occurs when man is at his most vulnerable state, i.e., when his condition of *che* (person) is weakened[73-76].

As it can be noted, just as for previously described Indo-European words, in the three last non-Indo-European commented words the same is observed: that

both in the Quechuan and Mapuche languages, "disease" is understood as being related to a state of discomfort in an individual, to his/her suffering or to a condition of weakness. The same applies to the Basque language, where the concept of disease is linked to bad, unfortunate and painful things. In addition, it should be highlighted that from the analysis of the original meaning of all the terms mentioned in this review, it can be observed that, in general, throughout the development of mankind and of our language, there has been a trend to underscore two aspects related to "disease": the subjective and the objective aspects. In this regard, let's remember that Leon Eisenberg[77] distinguishes the subjective ("illness") and objective ("disease") components of the states of disease. Although "disease" denotes pathophysiological processes and objectively substantiated lesions, confusions between "illness" and "disease" have been common[78].

In consequence, it can be summarized that the terms that designate the concept of disease and that have been analyzed in this review make allusion to the following: 1) a descriptive denomination of a subject globally perceived (predominantly in visual form) as weak, in bad shape, physically unwell, etc., and 2) the perception (hetero- and self-) of human suffering and ailment.

Discussion and conclusions

Prior to the discussion that will next develop, it is important knowing current philosophical postures about the concept of "disease". In this regard, three focuses are currently predominant: the normative, the naturalist and the hybrid focus. The normative focus poses that disease is a condition that has a load in terms of value. In contrast, naturalists claim that this state is objective. Within this approach, two perspectives are distinguished: the ontological and the physiological (nominalistic) perspective. The former poses that disease exists independently of the sick individual, while the latter states that disease coexists with the sick individual. Finally, the hybrid perspective is an attempt to conciliate questionings made to both the normativistic and naturalistic approaches. This approach states that a diseased state should only be considered as such when a "negative" value-wise human state occurs, but with a biological etiology[79-83].

Considering that these approaches summarize current theoretical context about human "disease", it is interesting to discuss the results of the etymological study of the present review in an integrated form to human neuroscientific knowledge. To that end, and first of all, it can be highlighted that at least all terms here reviewed denote human states, the main, temporary or permanent characteristics of which have been perceived and assessed as being weak, bad, suffering, etc. In consequence, throughout the history of mankind, and in different cultures, there would be a denotative consistency with regard to the perception of those specific human states where suffering or weakness is the common and main characteristic. In this regard, the concept of "disease" results from the neurocognitive processes that generalize those properties that characterize such human states. This is due to the fact that the denoting terms refer to real human states that, once perceived, are generalized or conceptualized. Indeed, some properties (the most important for a given context) of any human state assessed as being novel or threatening can be perceived both by others and by the individual that experiences them (hetero-perception and self-perception). This neurocognitive process comprises selective attention (especially visual) and emotional aspects[84-87]. Once the main attributes of direct perception or recall of a fact (e.g., a human state referred to as *sick*) are selected, a gradual generalization process is carried out from the particular percept to the formation of its concept. Therefore, by means of generalization processes, our knowledge about perceived things is formed, which is a key condition for an adaptive behavior[88]. In addition, since conceptual neurocognitive processes are flexible (neuroplasticity), development of other concepts is possible, i.e., creative propositional knowledge. Indeed, the most abstract cognitive constructs, which are neurally represented in the prefrontal cortex, not only are they executed, but are flexibly and creatively integrated and associated between each other[89-92]. Therefore, from the perspective of the development of our species, it can be proposed that, in general, from the perception of concrete facts, complex percepts are formed, which, in a process of further generalization, are conceptualized. Based on percepts and concepts, and thanks to the development of language, we can linguistically express them by means of the corresponding language.

With regard to the designation processes, we should bear in mind that they are sign-percept or sign-concept relationships. Consequently, and in general, it can be proposed that, in our cognitive processes, the initial trend is to denote or refer and, subsequently, to connote (establishing the sense or intention of the

concept). This is due to the fact that connotation demands higher cognitive effort, since it comprises the determination of the content or main attributes of a concept. For this reason, abstraction processes require adequate and sufficient neurodevelopment. In short, concepts are the result of neurocognitive integration processes related to things, to facts or to their properties, which can be designated by words, thus enabling better planning of our communicative actions[93-95]. With regard to the meaning of any given concept, from a synthetic perspective, it is proposed to be the result of its reference and its connotation[96,97]. Therefore, once a concept is connoted and referred, its meaning is achieved, which will be more or less complete according on how its connotation and reference are. In consequence, since the concept of "disease" is only moderately connoted, its meaning is imprecise.

It is important pointing out that most cognitive processes that enable conceptual connotation are inseparable from emotional o value-related constructs. In this regard, it should be highlighted that values are cognitive-emotional attributions that are made about facts; i.e., they are not entities existing by themselves[21]. Among them, not only the value of human life stands out, but the value of good life, i.e., the concept of healthy human life ("health"), which has prevailed throughout our entire history[98]. For this reason, all cultures have paid great attention to its counterpart: "disease". In spite of that, the meaning of this concept remains imprecise owing to, as previously noted, its incomplete connotation. Even so, in practice, "health" and "disease"-related disciplines have developed in a dizzying way, both in terms of etiology and diagnosis, therapeutics and prevention.

On the other hand, although learning is fundamental in interpersonal neurocognitive differentiation processes, i.e., in the formation of individuality, owing to the effect of early neurodevelopment (the main keys of which are genetic and molecular), our species has a common neurocognitive basis[99-102]. For this reason, regardless of our culture and language, we perceive, evaluate and communicate both our personal states and our general and social surroundings in a similar form. Consequently, although our perceptive and value-related processes are personal and relative, they don't necessarily imply an entirely subjectivist or relativist posture. That said, it is possible to propose that, at an early stage of our species evolution, some human states were generally perceived and evaluated as inadequate for functioning in a particular context or as states of suffering. With the progressive development of language, such states were descriptively denominated, first orally and then in writing. Then, with the refinement of our observation and analysis capacity, and with the subsequent development of technical medicine (i.e., from Hippocrates and *techné iatriké* to our days with genomic medicine and ecogenetics)[103], the descriptions of those human states perceived and evaluated as inadequate have been further detailed. However, within the perspective of the overall state of a human being denominated as a *sick person*, that what was originally denoted has persisted: weakness, suffering, bad personal condition, etc. But since scientific and technological advances have allowed for us to distinguish living organisms' components (organs, cells, molecules), the terms to denote overall physical weakness or suffering states (*enfermedad*, disease, illness) would not be the most adequate anymore. Indeed, strictly speaking, proposing that both a cell and an organ experience a *sick* state is not the most appropriate. In this regard, maybe it would be preferable to adopt the term "alteration", the meaning of which is more general since, as shown by its etymology, it refers to "change of something"[34,42,44,49].

In conclusion, according to current knowledge related to both neurocognitive processes and linguistics, all reviewed designations about "disease" would not be the most adequate if they are wanted to refer not only human being global state (perceived as physical weakness or suffering) but also other biological systems (organs and cells). Therefore, the expression "disadaptive biological alteration" (with regard to a particular context) might better represent what currently is understood by "disease", i.e., a change of state in a human being, or in part of him, that, in some particular context, makes for his functioning or biological processes to be discordant with the demands of his surroundings. Finally, since every change involves a space-time setting, then it is material, not conceptual objects that are altered. In this context, the expression "disadaptive biological alteration" would more faithfully denote those unfavorable changes (for a particular context) of specific real-material entities, such as cells, organs, organ systems, etc.

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