WHAT IS NATURAL AND WHAT IS UN-NATURAL IN CANCER?

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Biocosmology and cancer
Krakow
14-15 July 2017
The common perception of **cancer**

“Other diseases may be cured – but not cancer”

- The most **terrifying** /extreme illness – because of its irreversibility/menace of **irreversibility** – **imminence** of death
- The **criterion** towards which other diseases are “measured”
- The **model** of illnesses – a sudden, unexpected and never expected state, interrupting the sweet routine of life (model – the most radical illness)
- A **limit situation** brutally pushing people to think to the meanings of life when they can no longer change the projects and course
Cancer as a natural phenomenon

- The natural character of (non-traumatic) diseases – a “modern” (philosophical and scientific) idea → cancer too – natural

(because “cookery assumes the form of medicine, and pretends to know what foods are best for the body” [Plato, Gorgias, 464d] and thus “cookery is flattery disguised as medicine” [idem, 465b], “Doctors, too, are something whose services we shall be much more likely to require if we live thus than as before” [Republic, 373c-d])
- Plato and Aristotle (Hyppokrates) spoke about a general state of the body and soul: a general state generated naturally from within and treated with both local interventions (“expects his physician to give him a drug which will operate as an emetic on the disease, or to get rid of it by purging or the use of cautery or the knife” [Republic, 406d]) and general prophylaxis (temperance in diet, gymnastics, see music and gymnastics „not for the soul and the body except incidentally, but for the harmonious adjustment of these two principles by the proper degree of tension and relaxation of each” [idem, 411e-412a])
- Natural character = the causes (of cancer) are from within the organism, the remedies are both from within and from without
- Aristotle (the four causes – telos – and form/sunolon, see Bazac 2015, 2016): disease – both from within, generated by the internal act (energy/energheia) or constitution of the peculiar telos of the organism, entelecheia (Metaph.1050a), and from without: as a concrete form/sunolon – the concrete state of the organism –
– is both the result of the telos of the organism, i.e. the act/the becoming of the organism according to its pattern/form, and to the efficient causes of health or illness (diet, gymnastics, walking)

(“all potencies are either innate, like the senses, or acquired by practice”; “not only things which are inherent in an object are its causes, but also certain external things, e.g. the moving cause”, “Health, disease, body; and the moving cause is the art of medicine“, [Metaph. 1047b32-33; 1070b23-25, and 30-31])

- Today:
  - diseases/cancer – natural, causes from within and from without and must be analysed both from within and from without (some ones neglect I or II)
  - Concerning the internal causes: some ones – physico-chemical causes, others – the teleological ones too) (“mechanism” vs. teleology); in fact, childish opposition: see demonstration of teleology in [Bechtel and Abrahamsen, 260] mechanisms (as structures with functions) and dynamics, thus mechanisms in real time emphasising their manifestations as cyclic organisations with oscillations, are autonomous “far from equilibrium and must maintain themselves as such or die”; and that cells as interactions between molecules/molecular structures [Pebay-Peyroula et al.] are results of dissipative/irreversible processes where the internal information is part of/helps the energy transfer ultimately from without [Baverstock and Rönkkö]; this external environment – both internal to the organism (from organs/structures of cells, organism as such) and external
  - The teleological: the intertwining of the teloi of different levels (organism, organs, cells), including of the mind and psychic (teleological – result of n “mechanical”)
Life – internal telos (conatus) and functioning (internal telos – the maintaining of internal stability [Claude Bernard 1865; Cannon 1939, homeostasis] that works at every level of the complex

“The living system, due to its circular organization, is an inductive system and functions always in a predictive manner: what occurred once will occur again. Its organization (both genetic and otherwise) is conservative and repeats only that which works” [Maturana, 1970, in Glasersfeld, 1997]

• There are purposes (teloi) and functioning of “entities” [molecules, cells, membranes, synapses, organs (as in Ukhtomsky, a dynamical mechanism leading to the same results in constant conditions; see Ugolev and Ivashkin’s elementary functional blocks where “complex functions could be reached due to the recombination and transposition of a large though limited set of molecular machines realizing elementary biological operations”, 1992, in Chapouthier 2012 ], (ex. concentration of sugar in the blood, liver, pancreas) tissues, organism] at every level; all teloi and functioning influence each other, in a hierarchy of levels (where ↓, but ↑), but having a relative autonomy; the functioning controls i-o [ex. transport of ions; perceptions; Powers, in Mansel and Carey 2015], including, in an indirect manner, the inter-influence of teloi
Life – a multi-level multi-controlling combined mechanism or reorganisation (functions – signaled by the biochemical level of molecules) (!!! understandable in an integrative Newtonian and telic view; not only in a telic view, as Cziko asserts)

Cells - attractors – stable states toward which cells tend to evolve (telos) / all initial states converge (region of convergence – basin of attraction): cells – dynamic attractors (“young” state/proliferative; apoptotic) important – as intermediary level – for the biochemical processes and organic processes → all telic
Life – network of n networks at all the levels of the organism, where all the living processes (telic) have an i-o “Newtonian” c-e type of relations; all processes are at the same time conservative, attractive/telic, and creative [Sabelli 2001]

Creative processes – and with all the triunity/intermediary states/unity of opposites (Khroutski) – create opposite (bifurcation cascades) [Sabelli] (↔) : patterns and their transformation, diversification, complexification at all levels, imbricating in “mosaic”, “where at each and every level, the properties of the whole allow a large degree of autonomy to the component parts” [Chapouthier, 9]

– create complementary opposites, acting in synergy (Jaros)
– teleonomic systems [Jaros and Baker] having telentropy – measure of the likelihood of success to reach their telos; interaction of systems = transfer of telentropy (advantageous/disadvantageous)

When there are “contradictions of systemic divergence” [Bogdanov (1921) 1980] in the organism/between the levels of control / when the integrative process does not balance/compensate the differentiation/variability / there is less complementarity than opposition – the diseases of old age and cancer occur

Cancer – occurs at the level of cells, but – according to the level of health of the organism – its telos may counter, at least for a while the process at the lowest level (the fact that for a while one does not perceive the signals of disease is significant)

Cancer – when feedback loops do not preserve stability, plasticity, robustness
Cancer – occurs when the organisation/re-organisation, thus adaptation and learning, thus autopoiesis [Maturana 2002], face disturbing (repeated) processes of disadvantageous transfer of telentropy (from cancerous cell →)

Cancer – occurs when the biochemical reactions inside cells communicate with other cells and the networks of intercellular reactions generate heterogeneity and differentiation which respond to noise/information from harmful tendencies [see Koseska and Bastiaens]; cancer – cognitive process, as life is)

Cancer – occurs as a shift in cells [Chu, Lee, Cho] but as a result of combined environmental stress [Baverstock]
Cancer occurs at local level, but it is enemy of the whole organism
Death happens when the whole organism is defeated by cancer

When life is tired, cancer – a new life, but parasitic
Un-naturalness of cancer

If cancer is a natural phenomenon from the viewpoint of life processes, it is un-natural from the standpoint of humans. Cancer – un-natural from a cultural point of view (culture –specific difference of man).

MODES TO FIGHT CANCER – CULTURAL (scientific research)

• Since cancer – a new “life”, parasiting the original / normal / natural one, it has its own telos (its own “form”)
• It opposes to the telos of the de-formed organ, and to the telos of the organism → this does not mean to reduce the problem of cancer to local reparations, because it is the enemy of the organism (universe?), and not only of local organs
• Fighting cancer, the focus on the internal local points must be completed with the focus on the organism-environment system (change of matter-energy-information – is multi-layers organism-environment system)
• (causes of carcinogenic disorder/difference/variability/non-viability may be stored in the memory of cells, this genetic presence being in its turn a possible, not mandatory, cause of cancer; the most probable causes – are the actual ones (Aristotle))
MODES TO FIGHT CANCER – CULTURAL
(dialectic of the individual and the species)

• The individual has cancer: he want not die (The five stages of cancer grief: denial, anger, bargaining, depression and acceptance, Kübler-Ross)
• He is an individual, he fights as an individual only (with the help of others)

!!! He is also member of the human species, he is responsible for the human species, he is the mirror of the human species, as he behaves, the species behaves (depression, resignation ≠ specific to the human species)

• The human species – cultural = to create meanings of life
• In order to create meanings – a rich content of life is needed
• To assume the membership of the human species, to live as a member of the human species = to be responsible for his actions as a member of the human species
• His struggle with cancer – the struggle of the human species
• How to assume the membership of the human species, how to struggle as a human species? To have a social ideal, altruistic view about the necessity of the development of conditions for the manifestation of creativity of every human being and all of them
The **social ideal** – as a means to fight (not only) **cancer**

- To fight against the **irreversibility** (signaled by **cancer**) – to fight for a rich and human **content** of **life**
- Historically, not the **content** of life, but **death** was the end of the human preoccupation
  - premodernity: imagination of individual continuity in the afterworld; Heidegger - beings-toward-death = little every*day* care and **anxiety**; Nietzsche – solution: the moral transformation; it is not enough, Marx; Bergson – joy of life
- Joy of life – unique for every **individual**, but it does not concern only individual ends
- The care for the **content of life** – care for rich experiences and meanings enriching the species

- the individual – **species being** because “he makes the fate and fortune of the entire species his object” (Margolis, 332): he behaves as the **species** (**responsible** for the **species**)
- When the individual thinks and acts only as an **individual**, and not at the same time as a **species being**, he brings out the **koinonia**/community from his universe of thoughts = he is narrowing his **content of life**, as well as his struggle with the **irreversibility** of the **individual** death
- To assume the appurtenance to the **human species** – to know that the **individual** continue to exist in the **human species**
- The dialectic **individual – species** involves **mutuality**: the individual must behave in such a way as to respect the **humanity** of the species and to assure its development; but society must respect the **uniqueness** of the human individual
- To behave as a species: to be aware of this (Brăzdău)
If people consider themselves as members of the human species – they know that they will not fully die: they will survive as/within the human community

- the more they were preoccupied for its issues, the more they fought the factors limiting the humanity of all the human persons, the more they feel as future survivors
- To have as a beacon the social ideal follows Aristotle’s thinking that justice is the best or even the whole of Virtue because it means to practice virtue “towards others”, not towards oneself (N.E., 1130)
- The individual ↔ the human species /society: as the individual (behaves, is the mirror of) cares for the species, as society has to treat the individual as a unique being (respect the uniqueness)
- To have as a permanent priority the social ideal allows both the enrichment of the content of life and resources to fight the suffering of a final illness. My solution is to transform every healthy and ill person in a fighter not only against one’s own health, but also for social justice and bright future of humanity
References

• Baverstock, Keith and Mauno Rönkkö. The evolutionary origin of form and function, The Journal of Physiology, 592 (Pt 11), 2014, pp. 2261-2265
• Bernard, Claude. Introduction à l’étude de la medicine experimentale (1865), Paris, Garnier-Flammarion, 1966
• Bogdanov Alexandr, *Essays in TektoLOGY* (1921), Translated by George Gorelik, Seaside, Ca., Intersystems Publications, 1980


• Jaros, Gyorgy G. *Synergy of Complements in Living Systems*, [http://www.isss.org/primer/jaros.htm](http://www.isss.org/primer/jaros.htm)
• Maturana, H. R. “Autopoiesis, structural coupling and cognition: A history of these and other notions in the biology of cognition”, *Cybernetics & Human Knowing*, 2002, 9 (3–4), pp. 5–34
• Sabelli, Hector, “The Co-Creation Hypothesis”. In: Gillian Ragsdell, Jennifer Wilby (eds), *Understanding Complexity*. Springer, Boston, Ma, 2001, pp. 19-29