

Articoli/Articles

FROM GENERATION TO DEGENERATION.
THE HEALTH-DISEASE LINK IN GALEN'S CORPUS

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SUMMARY

*Through a reading of some significant passages a reconstruction is made of the main features of Galen's rich reflection on the themes of health and disease, with particular attention to two aspects. On one side, there is an analysis of the limits within which disease is seen, in the Galenic corpus, as 'degeneration' in relation to a 'natural' state. On the other side, there is an investigation of whether, and to what extent, the physician from Pergamon accepts the idea, partly already present in Hippocrates, of the existence of diseases that, with a modern term, we would define as 'genetic'. The marginality that this aspect seems to present – at least in theoretical works devoted to embryological themes (*De semine*, *De foetuum formatione*) or relating to pathological aetiology (*De morborum differentiis*, *De morborum causis*, *De symptomatum differentiis*) – is probably linked to the prevalence of a solid teleological paradigm deriving from Aristotle.*

Galen of Pergamon lived in the 2nd century AD and was the author of a very big *corpus* of writings on various themes. He gave us the most variegated and richest reflection on the concepts of health and disease in the ancient world, as is well known to anyone who has any familiarity with the history of Greek-Roman medicine¹. This reflection, which in actual fact runs all through Galen's production, devel-

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ops in a more specific way in some works in which the definition of the aforesaid concepts appears preliminary to more strictly medical investigation. These works are, on one side, the treatise on *Hygiene*, and on the other the imposing treatise on therapeutics entitled *De methodo medendi* (14 books), as well as a series of nosological and aetiological-pathological writings, in particular *De morborum differentiis*, *De morborum causis*, *De symptomatum causis*, *De symptomatum differentiis*, *De causis procatartisticis* (the latter has only survived in a 14th-century Latin translation).

Among the many aspects that Galen's reflection on these themes presents, it seems to me there are two that are strictly pertinent to the theme of our conference. On one side we will try to understand whether and to what extent disease is presented, in Galen's *corpus*, as 'degeneration' in relation to a 'natural' state. On the other side we will consider whether, and within what limits, the physician from Pergamon accepts the idea, partly already present in Hippocrates, of the existence of diseases that, with a modern term, we would define as 'genetic'.

Regarding the first aspect, of major interest is the treatise on *Hygiene*, in six books, devoted - like Hippocrates' *Regime* previously - to the dietetics of healthy people. The words with which it opens appear particularly significant:

Whereas the science concerned with the human body is one, [...] its foremost and largest subdivisions are two: one of these is called hygiene, the other therapeutics, differing in their respective functions, the former being concerned to maintain, the latter to modify the condition of the body. But since, both in importance and in time, health precedes disease (χρόνῳ καὶ ἀξιώματι πρότερόν ἐστιν ὑγεία νόσου), so we ought to consider first how health may be preserved, and then how one may best cure disease².

According to Galen, therefore, health has primacy over disease that is at once chronological and axiological. Insofar as it arises later in

the human body, it seems that the morbid phenomenon can be read as a change - a 'degeneration' - of the natural state.

It is however precisely in relation to the categories of 'natural' and 'unnatural', or of 'according to nature' and 'against nature', that Galen's speculation shows all its richness and depth. The fact is, first of all, that Galen seems to reject the polarization, traditional in so much of Greek culture, between *katá phýsin* and *pará phýsin*, for a less dogmatic and more open vision of human nature, in which the morbid phenomenon too is in some measure integrated within the natural order. In this sense we should read the affirmations (*San. tuend.* I 2) relating to the fact that of the impairments and deteriorations to which our body is subject, some prove inevitable and con-natural (σύμφυτοι), "since, so to speak, they have their roots in the principles of generation" (τὴν οἶον ῥίζαν ἔχουσαι τὰς ἀρχὰς τῆς γενέσεως)³. So - we could say - the transition to degeneration is, in a sense, inherent in generation itself.

At the same time, working out a broader and above all more subjective idea of what is 'according to nature' (*katá phýsin*) allows Galen to go beyond a rigid opposition between 'natural' and 'unnatural', and to redefine the concept of *katá phýsin* centring it on the single individual:

Nor is weakness of function, strictly speaking, a sign of disease, but only what is contrary to nature of individual (οὐδὲ γὰρ ἡ τῶν ἐνεργειῶν ἀσθένεια νόσου γνώρισμά ἐστιν, οὕτως ἀπλῶς εἰποῦσιν, ἀλλὰ ἡ παρὰ τὴν ἐκάστου φύσιν). We all see poorly, if we compare ourselves with eagles and with the lynx, and hear poorly compared to Melampus, and are weak in the feet compared to Iphicles, and in the hands compared to Milo, and in every function should be considered almost crippled in comparison with those excelling in this respect⁴.

If for Galen too it is true that "all diseases are against nature" (*San. tuend.* I 5: πᾶσαι μὲν γὰρ αἱ νόσοι παρὰ φύσιν), on the other hand he recognizes that not every disposition according to nature is in itself equivalent to health, nor is every disposition against nature

automatically identified with disease (the fact is that in this case dark skin due to sun or pallor due to spending a long time in the shade would also be disease). Therefore what distinguishes the healthy condition from the morbid one is essentially the possibility of performing actions/functions (ἐνέργεια). So:

Health is a condition producing function in accordance with nature (διάθεσιν κατὰ φύσιν ἐνεργείας ποιητικῆν), and disease a condition damaging function contrary to nature (διάθεσιν παρὰ φύσιν ἐνεργείας βλαπτικῆν)⁵.

Further, as we read in a context of anti-Methodic polemic:

So then, as I do not prevent them from applying names that are neither Greek nor logical, let them [i.e. the Methodists] in the same way allow me to apply the name 'disease', according to Greek and logical use, not to every condition that is contrary to nature, but only to whatever might harm function. Whatever might be contrary to nature and yet does not, in fact, harm function is not a disease but a symptom of disease (οὐ νόσον, ἀλλὰ σύμπτωμα νοσήματος)⁶.

As we see, in pathology, as in Galen's physiology, a primary role is assigned to the concept of 'action' 'function', and the definitions of health and disease also prove to hinge on this concept. Within this perspective, at various points in the *corpus* Galen affirms that only perceivable impairment of action (ἢ τῆς ἐνεργείας αισθητῆ βλάβῃ) marks a clear distinction between health and disease⁷.

But, going into more detail, what, according to Galen, produces degeneration in relation to a healthy state causing disease, which consists, precisely, in perceivable impairment of action? It may be useful, in this connection, to reread - *e contrario* - some of the numerous definitions of health that are dotted around in Galen's *corpus*:

I have written of this elsewhere, and have shown that health consists in a definite proportion of warm, cold, moist and dry in so-called homeomers,

From Generation to Degeneration

*and is fulfilled by the composition of the same homeomers, their quantity, size, and conformation in the organs*⁸.

*First, therefore, [...] health does not consist simply in a proper mixture or proportion of the elements of which we are composed, as almost all our predecessors thought, but merely in that of homeomers. Second, let it likewise be presumed, as also proved elsewhere, that health consists in the conformation, number, size and composition of homeomers in the organs*⁹.

Hence, consistently with the Aristotelian vision of a triple level of composition of the bodies of living beings (elements/qualities, homeomers, organs)¹⁰, diseases, according to Galen, are referable to three typologies: dyscrasias or bad temperaments (applicable to homeomers), anomalies in morphology and composition (applicable to organs), and breaks in continuity (applicable both to homeomers and to organs)¹¹. The defence of this formulation that, regarding the first level, is in line with the Hippocratic-Aristotelian-Stoic tradition, for Galen becomes the terrain of a clash with those, above all Asclepiad and the Methodists, who move within the horizon of the atomistic-corpuscular doctrines. For the latter, indeed, disease is essentially linked to a bad spatial relationship between particles of matter (*ónkoi*) and the channels (*póroi*) in which they move.

I can not in this context go into the details of Galen's theories relating to the causes of diseases, which show a major influence of the Stoics, as well as of Hippocrates, the extent of which has been well highlighted in studies by Robert J. Hankinson¹².

Inside this rich and variegated reflection on pathological aetiology, in Galen is there any idea of disease which to some extent can be qualified as 'genetic'?

As is well known, sporadic references to the heredity of certain diseases or certain characteristics can be found in Greek medical and biological literature before Galen. Thus in chapter 14 of *Airs waters places*, speaking of the distinctive physical characteristics of

macrocephalic people, the author affirms that, originally due to custom (νόμος), in the course of time it ended up becoming ‘natural’ (ἐν φύσει ἐγένετο), being transmitted - like other characteristics (baldness, squint, blue eyes) - from father to son¹³. A more strictly nosological context is referred to in the famous passage in *The sacred disease* (2,4-5) relating to the origin of epilepsy, where we read that “[Epilepsy] begins, like other diseases too (ὡσπερ καὶ τᾶλλα νοσήματα), through heredity (κατὰ γένος); in this connection, if a phlegmatic person has a phlegmatic child, a bilious person a bilious child, a person with consumption a child with consumption and a person suffering with the spleen a child suffering with the spleen, in the case in which a father or a mother is affected by this illness, what is to prevent his or her child from having it too?¹⁴” In both these works the idea of transmission of physical characteristics or diseases through heredity is connected to adhesion to the pangenetic theory of the seed (either male or female). By contrast, the generalization to be found in the passage in *The sacred disease* – which actually has no echo in any other work by Hippocrates – is very probably to be connected to the general context of the work and to the author’s very evident concern to place epilepsy too in a general aetiological framework, explaining its genesis in the same (natural) terms as those that explain the genesis of all other diseases.

Alongside these two well-known passages there is a list of pathologies that are in some measure ‘congenital’ (ὅ γὰρ ξυγγενές τι τουτέων τῶν νοσημάτων) and hence difficult to eradicate (δυσαπάλλακτον), contained in *Prorrhetic* II 5: dropsy, consumption, podagra (or gout) and, naturally, epilepsy¹⁵. And a chapter of *De genitura* (11), while on one side, again within the framework of the pangenetic theory of the seed, it repeats the idea of the transmissibility of malformations through heredity, on the other side it affirms: “that healthy children are born from people affected by malformations, happens in most cases (Ὅτι δὲ, πεπηρωμένων ἀνθρώπων,

ὑγιέα γίνονται τὰ παιδιά, ὡς ἐπὶ τὸ πλείστον συμβαίνει)¹⁶.” Finally, the existence of ‘congenital’ (συγγενικά) diseases, connatural to the body, is attributed to the Egyptian physician Ninyas, not otherwise known, in the doxography of *Anonymus Londinensis*¹⁷.

A perspective in many respects analogous to that of the Hippocratic author of *De genitura* can be found in a chapter of Aristotle’s *Historia animalium* (VII 6, 585b), in which the transmissibility of acquired characteristics also seems to be admitted (there is the example of the tattoo on the arm that reappears, in the form of a dark spot, after a generation)¹⁸, as well as the impairments (“maimed parents also have maimed children, for instance crippled people have crippled children and blind people have blind children”), but the conclusion is that “such cases are nevertheless rare; *usually maimed parents have perfectly healthy children* (τὰ δὲ πλείστα γίνεται ὀλόκληρα ἐκ κολοβῶν) *and there is no fixed norm for these things* (καὶ οὐδὲν ἀποτέτακται τούτων)¹⁹.” In all the great mass of biology texts by Aristotle this is the only explicit mention of the heredity of some pathologies and this phenomenon is presented in very open terms. This - as we shall also see speaking of Galen - is neither a chance one nor one without significance.

Coming round more specifically to Galen, here we will only make some essential observations. On one side, in Galen’s *corpus*, some clear references can be found to ‘congenital’ (rather than ‘hereditary’) diseases. One of the many is in a passage in the treatise on *Hygiene* (I 12) in which it is generically stated that “some bodies present such a bad constitution *from birth* (ἔνια γὰρ οὕτως εὐθὺς ἐξ ἀρχῆς κατεσκευάσται κακῶς) that they could not even reach the age of sixty even if Asclepius himself was responsible for treating them.²⁰” And the congenital nature of various malformations and mutilations is here and there expressly recognized in Galen’s *corpus*²¹. Yet neither the embryological works (*De semine*, *De foetuum formatione*) nor those dedicated to pathological aetiology (*De morborum*

differentiis, *De morborum causis*, *De symptomatum differentiis*, *De causis procatartictis*) seem to take up - at least in an organic way - the theory of the existence of hereditary pathologies. This theory - as we saw - was already partly present in Hippocrates, and in the works mentioned Galen's reflection does reach a very high level of development and in-depth examination. So this datum appears very significant. An illuminating example is that of the numerous references by Galen to epilepsy and its causes²². In none of these - as it seems to me emerges from the preliminary examination I have made of them - does he repeat the affirmation of the hereditary character of disease found in *The sacred disease*: a work that after all, as it is well known, Galen doesn't ever cite. Further, the κατὰ γένος connection "used there by the Hippocratic author in the specific meaning of 'through heredity'" in Galen's *corpus* has quite another meaning.

The impression that is derived is that if allusions to 'genetic' (or more simply 'hereditary') diseases can be found within Galen's very big production, these must be sought in the numerous presentations of clinical cases the *corpus* is full of. By contrast, the absence of any systematic treatment of the theme in the theoretical works devoted on one side to embryology, and on the other to pathological aetiology, cannot be - I believe - due to chance. Indeed, if it is natural that, as a professional of wide experience and a careful reader of the *Corpus Hippocraticum*, as well as of Aristotle's biological works, Galen could not ignore the theories of his predecessors on the subject of heredity of characteristics and also, in some cases, of diseases, on the other hand it appears evident that excessive stressing of this aspect - above all in theoretical writings - would have involved a weakening of the teleological perspective that so much permeates the philosophical-scientific horizon of our author, as it already did that of Aristotle²³. It is perhaps not hazardous to conclude that because of the prevalence of this strong paradigm - even more than because of strictly technical-scientific limits or because of the lack of interest attributed in antiquity

to medical treatment of children (Grmek) - the systematic discovery of 'genetic' disease was only to come several centuries later.

BIBLIOGRAPHY AND NOTES

1. On this topic see GRIMAUDO S., *Difendere la salute. Igiene e disciplina del soggetto nel De sanitate tuenda di Galeno*. Napoli, Bibliopolis, 2008.
2. *San. tuend.* I 1, p. 3,2-9 KOCH (CMG V 4.2, Lipsiae et Berolini, 1923). English translation by GREEN R. M., *A Translation of Galen's Hygiene*. SINGER-IST H. E., With an Introduction by. Springfield Illinois, Charles C Thomas Publisher, 1951.
3. *San. tuend.* I 2, p. 4,1-5 KOCH. Here Galen refers to impairments that act on the original composition of the living being relating to the qualities of heat, cold, dry, wet, as well as to the daily outflow (*rhýsis*) of bodily substance. On the theme see also, among the other passages, *De elementis* I 7, p. 118,17-19 DE LACY (CMG V 1.2, Berlin, 1996): "All bodies that come into being and pass away undergo two kinds of change: their substance is altered (in quality) and at the same time it flows away."
4. *San. tuend.* I 5, pp. 10,35-11,5 KOCH.
5. *Ibidem*, p. 11,24-25 KOCH.
6. *Meth. med.* I 9, I, pp. 110,25-112,3 JOHNSTON I., HORSLEY G. H. R., *Galen. Method of Medicine*, I-III. Cambridge Mass.-London, Loeb Classical Library, 2011.
7. On this topic see BOUDON V., *Le rôle de la sensation dans la définition galénique de la maladie*. In: BOEHM I., LUCCIONI P. (éd. par), *Les cinq sens dans la médecine de l'époque impériale: sources et développements*. Actes de la table ronde du 14 juin 2001, Lyon, 2003, pp. 21-30.
8. *San. tuend.* I 1, p. 3,13-17 KOCH.
9. *San. tuend.* I 4, p. 7,27-34 KOCH.
10. Cf. *Part. an.*: II 1646a 13-24, and *Gen. et corr.* II 3-8, 330a 31-335a 23.
11. The tripartition is clearly expounded, for example, in *De morborum differentiis* (K. VI 836-880).
12. See in particular HANKINSON R. J., *Galen's Theory of Causation*. ANRW II 37.2, Berlin-New York, De Gruyter, 1994, pp. 1757-1774.
13. *De aër.* 14. On this famous text see PIGEAUD J., *Remarques sur l'inné et l'acquis dans le Corpus Hippocratique*. In: LASSERRE F., MUDRY Ph.

- (éd. par), *Formes de pensée dans la Collection Hippocratique*. Actes du IVe Colloque International Hippocratique (Lausanne, 21-26 Septembre 1981), Genève, 1983, pp. 41-55. The possibility of transmission by heredity of these characteristics is admitted in Galen's Commentary to the passage in *De aër.* 14 (*In Hippocratis De aere aquis locis librum commentarii*). I thank very much Professor Gotthard STROHMAIER for allowing me to read the draft edition of the Arabic translation that he is preparing for the *CMG Suppl. Or.*
14. *De morb. sacr.* 2,4-5 GRENSEMANN.
 15. *Prorrh.* II 5.
 16. *De genit.* 11.
 17. *An. Lond.* IX 37-40 MANETTI: ὁ δὲ Αἰγύπτιος Νινύ[ας] συγγενικὰ γί(νεσ)θ(αι) πάθη .[καὶ τὰ μὲν συγγενικὰ εἶναι.
 18. An analogous perspective (but with some differences in the details) can be found in *Gen. an.* I 17 721b 29-722a 1: “[...] children are formed resembling their parents, not only in congenital details, but also in acquired ones. It has happened that children of parents with scars presented the imprint of the scar in the same place, and at Chalcedonia the son of a father tattooed on the arm showed the same design, though confused and not clearly defined.” It is to be noted, however, that in this case the issue is attributed by Aristotle to the supporters of the pangenetic theory of the seed, to which he does not adhere.
 19. *Hist. an.* VII 6 585b 28-36: Γίνονται δὲ καὶ ἐξ ἀναπήρων ἀνάπηροι, οἷον ἐκ χωλῶν χωλοὶ καὶ τυφλῶν τυφλοί, καὶ ὅλως τὰ παρὰ φύσιν ἐοικότες πολλάκις, καὶ σημεῖα ἔχοντες συγγενή, οἷον φύματα καὶ οὐλὰς. Ἦδη δ’ ἀπέδωκε τῶν τοιούτων τι καὶ διὰ τριῶν, οἷον ἔχοντός τινος στίγμα ἐν τῷ βραχίονι ὁ μὲν υἱὸς οὐκ ἐγένετο ὁ δ’ υἱδοῦς ἔχων ἐν τῷ αὐτῷ τόπῳ συγκεχυμένον μέλαν. Ὀλίγα μὲν οὖν γίνεται τὰ τοιαῦτα, τὰ δὲ πλεῖστα γίνεται ὀλόκληρα ἐκ κολοβῶν, καὶ οὐδὲν ἀποτέτακται τούτων.
 20. *San. tuend.* I 12, p. 29,28-30 KOCH.
 21. One example for all is *De morb. diff.* 7, K. VI 857,3-6 and 8, K. VI 863,8-12.
 22. In addition to the *Puero epileptico consilium* (K. XI 357-378), the Galenic *corpus* includes 104 attestations of ἐπιληψία/ἐπίληψις and a few others of the nexus ἱερὰ νόσος.
 23. On Galen's teleologism see MORAUX P., *Galien et Aristote*. In: LAGA C. (ed. by), *Images of Man in Ancient and Medieval Thought. Studia G. Verbeke*. Leuven, 1976, pp. 127-146; ID., *L'Aristotelismo presso i Greci*, II/2, *L'Aristotelismo nei non-Aristotelici nei secoli I e II d. C.*. Milano, Vita e Pensiero, 2000 (Berlin, De Gruyter 1984), pp. 324-325; KOVAČIĆ F., *Der Begriff der Physis bei Galen vor dem Hintergrund seiner Vorgänger*. Stuttgart,

From Generation to Degeneration

Steiner, 2001, pp. 210-234; JOUANNA J., *La notion de nature chez Galien*. In BARNES J., JOUANNA J. (éd. par), *Galien et la philosophie* ("Entretiens Hardt" XLIX). Genève, 2003, pp. 229-262; CAMBIANO G., *Galeno, Erasistrato e la teleologia di Aristotele*. In: MANETTI D. (a cura di), *Studi su Galeno. Scienza, filosofia, retorica e filologia*. Atti del seminario (Firenze 13 novembre 1998), Firenze, 2000, pp. 47-57.

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