BIOGRAPHY OF A FIBRE: RISE AND FALL OF AN IMAGE

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"(...) One thing expresses another (…) when there is a constant and regulated relationship between what can be said about one or the other (…). It is in this sense that a perspective's projection expresses its own geometry. Expression is common to all forms; it is a genre from which natural perception, animal sentiment and intellectual knowledge are species (...)";
"(...) Much like representation the efficacy of structure is also semiotic (…). It is through representation that the structure is given, more precisely through the in-between-expression. The whole does not signify the unity but the concealed affinity of things (...)".
F. Gil, *Mimesis e Negação,*1984, p. 223f

Abstract

First and foremost this paper focuses on the hypothesis of the 'baroque' fibrous model or representation of the body, as contrasted with the porous image of the body (formally proposed by the ancient Methodists). The fibre was a strong and pregnant presence for physicians as diverse as Boerhaave (1668-1738) and John Brown (1735-1788). Furthermore, I will try to face the challenge by Stephen Gaukroger (*The Collapse of Mechanism and the Rise of Sensibility*, 2010, c.p. 388) and Charles T. Wolfe (*Why was there no controversy over Life Science in the Scientific Revolution?* 2010) about a narrative of change of sensibility around 1750 in the European mind and the narrative of the 'absence of Life'. "Mechanism, cropuscularianism, baconian natural philosophy (to which one could add Locke's helmontian medical reflexions but also his philosophical consideration on 'life') (…) do not address the question of Life." This question was only present in Glisson's *De Vita naturae* (Wolfe, p. 9), and Stahl's compulsive question: "What is life?" (idem, p. 17). Indeed, there are foreclosed assumptions in the usual discourses about the *scientific revolution*: substance, personal identity, life/death, generation, *semina rerum*, species, anatomy, animal souls, irritability, fibrous body (Gaukroger, Wolfe, etc).

But what about Leibniz, and Boerhaave, and all the others? Is not philosophy *always* a reflexion on Life? And can Medicine be practised forgetting Life, disease and death? The fibre microstructuralism according to Duchesneau was a consistent research program that produced the best "bricks" to found the concept of organism (*Les Modèles du Vivant de Descartes à Leibniz,* 1998, p. 184f). It included the following premises: (i) the fibre, as the elementary structure of the organs; (ii) a *resolutio ad minima* (+/- microscope); (iii) the mechanistic "ideology" (diversely adopted by the main protagonist of the modernization of medicine: Borelli, Malpighi, Stenon, Boerhaave, the British "vitalists": Glisson, Croone, Willis; animists

like Perrault and notable clinicians like Baglivi; finally it presupposed the Glissonian or, latter, Hallerian concept of (iv) irritability.

It is well known how significant was the work of doctors like Glisson, Helmont and Stahl, for instance, for Leibniz thought: *"(…) Promoteur déterminé du méchanisme des modernes contre Stahl, Leibniz va tendre à inscrire ou ré-inscrire l'analyse de l'organisme vivant sous les exigences génèrales d'une science des phénomènes bien fondés (…). C'est dire qu'il ne saurat formellement y avoir d'organisme sans entéléchie qui prend forme d'une monade hégémonique (…). (p.369)"(…) du point de vu des monades hégémoniques, tout les phénomènes vitaux se conçoivent selon un enchaînement des représentations perceptives/appétitives s'étendant du champ de la conscience réflexive à celui de la pluralité infinie des déterminations infraconscientes. (…) Mais Leibniz récuse les natures plastiques formelles (…et…) à ce titre l'âme stahlienne (…). (…) il importe de chercher la raison suffisante des effets physiologiques dans les mouvements subtils et les microdispositifs en interaction dynamique au sein de l'organisme (…)""(…) Comment alors peut-on passer du territoire organique au territoire monadique et vice-versa? En se servant, aurait répondu Leibniz, de ces rapports réglés d'expression (…)"* (Duchesneau, op. cit. p.370).
With empirical data (the book *On Fevers* by José Pinto Azeredo, 1766-1810, and other books) I will argue for the relevance of Duchesneau ideas.

Naturally, the post-cartesian medical doctrines and controversies were determinant for the emergence of solidist post-galenic Medicine. The theories on the structure or the fabric of the "body" or about "life" by doctors and/or philosophers who participated in the early modern "mechanization of the world" are my main topic, as far as they are relevant for the issues of the fibrillar structure of the human frame and of the tissue or organ *irritability*.

I will look at the meaning of the fibrous *human fabric* for G. Canguilhem, O. Temkin, among others. "*Irritation and irritability, as Glisson called the reactivity of living fibres to stimuli, though essentially animist concepts, proved (to be) biologically and medically productive. Galen's teleological approach to human biology – it must be differentiated from its theology – was not defunct. Much of Aristotle and Galen can be perceived in the vitalism growing in the eighteenth century and dominant in the early nineteenth*." (Temkin, *Galenism. Rise and Decline of a Medical Philosophy*, 1973: 179). Even if desirable there is no space to enter here into Michel Foucault's works (what I did elsewhere, as in my latest "O carvalho, o mato e a floresta. Das fundações da clínica no *Traité Médico-Philosophique sur l' Alienation Mentale* de Pinel, de 1809", 2010). I will argue that the fibre was a short-lived baconian object, pregnant both at the macro and the microscopic levels, behaving as an epistemological obstacle (Bachelard) to the acceptance of the cellular structure of the living tissues, and delaying its validation for more than one century (I first encountered this hypothesis in Canguilhem). Of course other influences were also significant, namely the problem of chromatic aberrations.

Accordingly, the presentation will have the following parts:

1. The consistent presence of the fibre and the theory of irritability in early modern medicine - a *topos* of the baroque imaginary?
2. *Demonstratio*: the "fibre" as an *index sui* et *veri* and a rhetoric icon,
3. One "epistemic" and "ontological" question: was the fibrillar theory (or the fibrous *body model*) a barrier or a "key" to cell theory ?
4. Conclusion: "Bloody" questions

The work *On Fevers* by José Pinto Azeredo (1766-1810) will be presented as a demonstrative case-study of the clinic-pathological use of the fibre icon. Azeredo was an Enlightenment Brazilian Portuguese doctor who published *Essays about Some Infirmities of Angola*, in 1790, probably written when he was the director of Luanda's Medical School (1790-1797). As a clinician, he defended a sceptical attitude, adopting the fibrous model of the body and, critically, Cullen's 'system'. Remarkably, the fibre meta-narrative seems to shed light not only on the pre-modern categories of gender thinking but also on the enigmatic 'joy of the rigidity' and repression that both Gaston Bachelard and Fernando Gil recognised in the social construction of modern science. This paper presents a work-in-progress that addresses very difficult interdisciplinary subjects (Glisson's natural perception, Sthal's mixtion or Leibniz's *spatium*), and is therefore fated to let many questions open and many issues barely hinted at. I will conclude mentioning a few of them.

Natural philopsophers/ Physicians	Marks of organic structure or texture (or fabric – Boyle) (# body & # life)	Observations
Descartes1632/1664, Traité del'Homme	*Res extensa, res cogitans*: union – pinéale (cp. galenic *rete mirabilia*)	Blood->heart's heat; Filets, Semen.<Harvey>
Boyle, 1688: Desqui. about final causes	Hydraulic-pneumatic machine	<Watch>
Glisson, 1672, 1677	Irritation; Irritability Fibres's natural perception (fibrous/fibrillar body?)	<Harvey's program, On generation>
Cudworth, 1678, The true intelectual System… Cambridge Platonists	"Plastick Nature underhim (God) (…) execute that part of his Providence (…) motion of the matter (…) forasmuch this Plastick matter cannot act electively"	Finality Hylarchic principle
Baglivi, 1696: *De praxi medica*	Chemico-mechanical. Heart/blood rule over Motor fibers: Vessels/entrails over (perceive) sensations Laxus= chronic diseases; strictus= acute diseases	Oscilatory activity of membranous fibres
Hoffman, 1694…, Foundations of Medicine / Pathology, II,2	"Notre corps n'est pas une pure machine"; ether – source of motion; "homeostasis"	Blood ; fermentation
Stahl, 1708: Vrai Théorie Médicale	"Mixtion mucido-addipeuse" de terre subtil – ténacité et souplesse, corruptible. Passivité du corps	Âme; *vis medicat. nat.* Inconscient
Leibniz, 1786, Anidmaversionis, etc	Machina hydraulica-pneumatica pyrotecnica	Monads *Spatium*
Haller, 1774-1776, Bibliotheca Medicinae practicae (?)	"Fibre in Physiology equals line in Geometry" ; Sensibility/nerves, etc. # irritability/muscles, dead organism	Experimental physiology (living matter)

Diderot, 1779/1781: Le Rêve de d'Alembert	Le prodige c'est la vie, c'est la sensibilité; fibre=animal simple, homme=anim. Composé	Fermentation; action/reaction

A selection on fibers and fevers

Aristotle. Parts of Animals. II, 650b,15-
'What are called fibres are found in the blood of some animals but not of all. … For one part of blood consists mainly of water and therefore does not coagulate, this process occurring only in the other and earthy constituent, that is to say in fibres, while the fluid part is evaporating.
651a1-: The fibres therefore, being earthy and solid, are turned into so many hot embers in the blood and cause ebullition in the fits of passion. These explain why bulls and boars are so choleric and passionate. For their blood is exceedingly rich in fibres.
651a12-: The character of the blood affects both the temperament and the sensory faculties of animals in many ways. This is indeed what might reasonably be expected seeing that the blood is the material of which the whole body is made.
651b6-: But the blood as already stated is not sensitive'.

Glisson 1597-1677: *Definition of fibre*: 'Quare triplex robur fibrarum hic considerandum, insitum, vitale & animale. (…) Robur insitum, uti dictum, potissimum consistit in fibrae justa carnositate & tenacitate…' (Glisson, *De ventriculis et de intestinis*, 1677, p. 164)

Boerhaave 1668-1738: 'the simplest diseases can be reduced to the simplest fibres'

Von Haller 1708-1777: 'fibre in Physiology equals line in Geometry'.

La Mettrie 1709-1751: 'each small fibre or piece of the organized body moves according to a self-determined principle'.

Definition of Fever (*Fièvre* in Col de Vilars's Diccionaire Médicale, 1759)
= 'the deregulated movement of the blood mass with an increase in the pulse and the lesion of the bodily functions as well as *often* with excessive body heat; the most important sign is the acceleration of the pulse when it lasts for some time and some function is damaged'.

Cullen (1710-1790): 'The remote causes are certain sedative powers applied to the nervous system … this debility proves an indirect stimulus to the sanguiniferous system; hence by intervention of the cold stage, and the spasms connected with it, the action of the heart and large arteries is increased'.

J.P. Azeredo 1766-1810: 'I am deeply convinced that in all fevers, both inflammatory and nervous, there is a spasm on the body's surface. Because the moving fibres disturb one another and lose their natural state,

they immediately tend to develop a spasm, driven by a general law of animal economy' (*Essays*, p. 34).