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The language of medicine in the *Philosophical Transactions*: Observations on style

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ABSTRACT

Medicine is one of the most fully represented disciplines in the *Philosophical Transactions* (*PT*), particularly in the materials dating from before the establishment of medical societies and of specialized journals. Medical events were recorded and described, data were collected, interpreted, and discussed. The need for a faster communication among professionals brought about new written forms. Shorter texts were adopted to exchange up-to-date information.

This investigation focuses on a selected number of texts to verify the origin and the nature of any rhetorical and stylistic changes which may have occurred in the *PT* during the eighteenth century. The selection of extracts constitutes the basis for a detailed discussion of rhetorical and stylistic issues.

Between 1702 and 1801 medical writing in the *PT* undergoes major changes: these are gradual shifts along a continuum highlighting an essentially author-centered approach at the outset of the century and an object-centered perspective at the end of the period.

Keywords: eighteenth century, *Philosophical Transactions*, medicine, research article, style.

1. Introduction

The *Philosophical Transactions* of the Royal Society of London were established in 1665 as a “private venture” (Gross et al. 2000: 372) by its secretary Henry Oldenburg. He was not a man of science but he strongly believed in the advancement of learning through widespread, systematic and periodical

communication (Bazerman 1988: 129). He thought that the Society needed a place in which members could report observations on natural events, case studies, experiments, research results and anything that could be of interest to spreading new ideas and new discoveries. The elaboration of up-to-date knowledge and the possibility to communicate it in the vernacular – particularly by letter – encouraged social interaction within the Society itself and across other domestic and foreign societies, since the *Philosophical Transactions* (hereafter *PT*) were “meant to serve as a newsletter, to favour the spread of news within the Royal Society and other learned circles” (Gotti 2011: 204). Henry Oldenburg, besides inventing “the modern scientific journal” (Atkinson 1996: 334-335), helped establish a vast scientific network and “bring together a previously dispersed scientific community” (Bazerman 1988: 130). He actually was the first editor – and author as well – of that huge correspondence which constituted the bulk of the first issues of the *PT* and characterized much of seventeenth- and eighteenth-century writing across disciplines (Gotti 2014: 151-156).

The *PT* also represented the outcome of a kind of “cooperative endeavor [...] of individuals with common interests who were engaged in work that was commonly perceived to be of value” (Dear 1985: 147). This does not mean that these individuals worked together: even though the Royal Society failed in supporting shared projects and “was more of a club than a college” (Dear 1985: 147), the *PT* acted as a “collective voice” (Dear 1985: 147). They served to highlight the members’ shared interests and shared values on the new approach to knowledge. These interests and these values rejected the principles of authority and the traditional outlook on reality based on it, in favour of an innovative approach focused on direct experience and experimentation. The Royal Society represented such epistemological innovation; it embodied intellectual inquiry within a micro-community of expert and non-expert members involved in the most diverse domains.

Among the multifarious disciplines, medicine is one of the most fully represented in the *PT*, particularly in the materials dating from before the establishment of medical societies in London and of specialized journals in the 1780s. The approach to medical research had been changing over time and medical activity had been steadily increasing during the seventeenth and eighteenth centuries. This change of perspective in investigating medical events, that is the introduction of a more practical outlook on them with the aim of recording, describing, collecting data and later interpreting them to generalize medical issues, highlighted the need of new written forms. These were different from the most traditional ones, such as treatises and long dissertations. Shorter texts were useful to support a faster

communication among professionals (naturalists, physicians, anatomists, scholars, practitioners, surgeons, etc.) and non-experts alike. Moreover, the inclusion in the *PT* of “frequent references to other contemporary scientists working on the same topics” (Gray et al. 2011: 224-225) promoted and supported discussion and debate over long distances as well. This kind of writing also helped make medical innovations and case studies known to a wider reading public, thus establishing a vast informative network (Fontes Da Costa 2009). The scientific journal, both general and specialized, answered all these needs in a new communicative and dynamic context. According to Bazerman,

the invention of the scientific journal necessitated the invention of the scientific article. The experimental report, as any other literary genre, was invented in response to a literary situation and evolved through the needs, conceptions, and creativity of the many authors who took it up. [...] the genre of experimental article has origins in essay, epistolary, and journalistic writing of the seventeenth century [...] the internal dynamics of scientific communication within a journal forum reshape the initial sources to create a new communicative form, powerful enough to influence other forms of communication and the social structure of the community which uses it. (Bazerman 1988: 59, 63)

This means that what is now known as the ‘research article’ underwent major rhetorical and stylistic adaptations over time, particularly concerning discourse and linguistic features. The growth in the number of texts ran parallel to a radical change in medical prose within a more general development of scientific writing (cf. Banks 2008).

2. Source texts

The texts under scrutiny here are 46 epistolary and non-epistolary medical articles published in five volumes issued at intervals of about twenty-five years, between 1702 and 1801. They represent about 10% of all medical articles issued in the *PT* across the century. Articles in Latin (which are the minority) are excluded from this analysis.

The medical article is a broad categorical type including epistolary articles, variously defined in the *PT* as *letter*, *part of a letter*, *extract(s) of a letter*, *account ... in a letter*, etc., and non-epistolary articles, labelled as *account*, *instances*, *case(s)*, *relation*, *observation*, *practice*, *abridgement*, *attempt*, *remarks*,

examination, proceeding, explication, discourse, description, dissertation, thoughts, essay, method, lecture, etc. These denominations hardly correspond to genre differentiation (Atkinson 1999: 80-81); overlapping and merging are common¹.

Volumes 23 (for the years 1702-1703, issued 1704), 47 (for the years 1751-1752, issued 1753), and 91 (for the year 1801, issued 1801) are the most relevant.

Volume 23 marks the turn of the century and also marks, under the influence of Newton, the beginning of a change in the rhetorical strategy to framing science. Newton perceived the *PT* as a “vehicle for concrete findings [...] so that they appear as concrete facts, [...] even though the events that made these facts visible [...] occurred in a private laboratory as the result of speculative ponderings and active experimental manipulations” (Bazerman 1988: 90). This means that Newton introduced new discourse practices to fit a new rhetorical situation in writing science, since he envisaged “the narrative of the scientist operating under procedures [...as] the main rhetorical resource to establish the credibility of the events and conclusions” (Bazerman 1988: 92).

Volume 47 establishes peer reviewing for the publication of articles. For previous volumes, the editorship was carried out by the secretary, whereas from 1752 a more institutional and controlled approach was introduced and proposals for vol. 47 were to be approved by a committee. In the Advertisement to the reader it is declared that:

THE Committee appointed by the *Royal Society* to direct the publication of the *Philosophical Transactions*, take this opportunity to acquaint the public, that it fully appears, as well from the council-books and journal of the Society, as from the repeated declarations, which have been made in several former *Transactions*, that the printing of them was always, from time to time, the single act of the respective Secretaries, till this present XLVII. volume. [...]

¹ According to Gotti (2011: 209), “As regards the *PT*, [...] this journal greatly contributed to the textual development of specialized discourse by giving rise to a number of new genres in English. The various issues of the journal consist of a variety of text types, referred to in the journal itself by several different titles: for example, ‘accounts’, ‘calculations’, ‘comparisons’, ‘descriptions’, ‘essays’, ‘experiments’, ‘explanations’, ‘extracts’, ‘inquiries’, ‘investigations’, ‘letters’, ‘observations’, ‘proposals’, ‘remarks’ and others. The same titles were often used to introduce very different types of texts, and similar text types were often referred to by different names. Indeed, at this time, textual forms were still very loosely structured, and there were not yet any clear conventions and codifications concerning them”.

But the Society being of late years greatly enlarged, and their communications more numerous, it was thought adviseable, that a Committee of their Members should be appointed to reconsider the papers read before them, and select out of them such, as they should judge most proper for publication in the future *Transactions*; which was accordingly done upon the 26 of March 1752. And the grounds of their choice are, and will continue to be, the importance or singularity of the subjects, or the advantageous manner of treating them; without pretending to answer for the certainty of the facts, or propriety of the reasonings, contained in the several papers so published, which must still rest on the credit or judgement of their respective authors.

It is likewise necessary on this occasion to remark, that it is an established rule of the Society, to which they will always adhere, never to give their opinion, as a body, upon any subject, either of nature or art, that comes before them. (*PT* 1751-1752, 47, Advertisement)

Volume 91 marks the end of the period as a whole as well as the end of the last quarter of the century, characterized by the British Medical Reform, the professionalization of medical education and activity, and the establishment of medical journals in London.

Volumes 35 (for the years 1727-1728, issued in 1729) and 67 (for the year 1777, issued 1777) highlight two middle steps, since they mark the twenty-five years' interval established for the present rhetorical and stylistic analysis. On the one hand, volume 35 marks the end of the Newtonian administration and hence the possibility to verify whether any stylistic change took place in scientific writing under his influence. On the other hand, volume 67 marks both the end of the twenty-five years after the introduction of the peer reviewing procedure in the *PT*, and the beginning of major changes in the organization and implementation of medical knowledge in the contemporary medical community.

3. Aims and Method

My investigation focuses on a selected number of texts to verify the origin and the nature of any stylistic changes which may have occurred in the *PT* – and in the community of writers producing texts – throughout the eighteenth century.

The focus and the approach are primarily qualitative, even though a basic quantitative survey has been used to frame the rhetorical and stylistic analyses and discuss them in a more inclusive context.

Some major studies, such as Biber (1988) and Biber – Finegan (1989) on a multidimensional (MD) approach, have helped establish the methodological perspective. Biber (1988: 21) maintains that “linguistic variation must be analyzed in terms of sets of co-occurring features”, since linguistic features considered in isolation cannot account for systematic variation. Linguistic features can be grouped into ‘dimensions of variation’, and these “dimensions comprise those features that actually co-occur [in texts], rather than a set of features that the researcher expects to co-occur” (Biber 1988: 23). Recurring linguistic features tend to be pervasive in a text – or in a set of texts – and to indicate a specific communicative function (here conveying scientific information): in this case, they become conventional *stylistic* features, rather than *functional* register features (Biber – Conrad 2009: 53-55). However, co-occurring features may belong to different dimensions, that is to say, “several overlapping co-occurrence patterns within any set of linguistic features” (Biber 1988: 23 and 101)² can make it difficult to identify a single dimension and/or a specific communicative function. The style(s) of medical writing in the *PT* may thus be characterized by different dimensions of variation.

Bazerman (1988), Atkinson (1996), Gross et al. (2000) and Gotti (2011) have analysed the research article in the *PT* as a newly developing genre. In particular, Atkinson’s works (1996 and 1999) applying Biber’s MD approach (1988) and Bazerman’s study (1988: 62) on the experimental article in the *PT* focusing on the “social dimension” of encoding scientific writing have served as background models.

The present research considers two major interdependent perspectives: a chronological one and a stylistic one. In other words, it discusses historical change in the linguistic style(s) of research articles (Biber – Conrad 2009: 162).

The chronological perspective focuses on stylistic changes in medical writing across time.

The stylistic perspective focuses on the pervasive and co-occurring linguistic features of medical articles, that is to say on their style. According to Biber – Conrad,

² Biber’s dimensions are six (1988: 122 and 199): 1. Involved vs. Informational; 2. Narrative vs. Non-Narrative; 3. Explicit vs. Situation-Dependent Reference; 4. Overt Expression of Persuasion; 5. Abstract vs. Non-abstract Information; 6. On-Line Informational Elaboration.

The style perspective incorporates the same kind of linguistic analysis as the register perspective: a relatively comprehensive analysis of core lexical and grammatical features [...]. However, the basis of comparison is different from the register and genre perspectives. That is, the style perspective is usually used to compare texts within a single genre/register [...]. In this case, linguistic differences are not associated functionally with the situational context, because all of these texts are produced in similar situations. (Biber – Conrad 2009: 71-72)

According to the MD approach, the analysis is based on the following dimensions of variation, each dimension being characterized by two poles along a continuum. Polarity is highlighted between brackets:

1. Involved (face-to-face interaction) vs. Informational (academic prose)
2. Narrative (fiction, account, etc.) vs. Non-narrative (academic prose, official document, etc.)
3. Abstract (academic prose) vs. non-abstract (face-to-face conversation)
4. Situation-dependent (listener's knowledge of imminent context: place, time, other adverbs, etc., ex. personal letters) vs. Elaborated/Explicit Reference (official documents, professional letters, academic prose, etc.)

This clearly implies a focus on the role of the writer as emerging from the text(s) and, especially, the relationship between the author (writer, reporter, eye witness, researcher, etc.) and the object (topic, case study, personal experience, professional experience, etc.) of the discussion, narration, account, report, description, etc. or, in other words, the relationship between an author-centered perspective and an object-centered perspective.

According to Atkinson (1992: 338 and 340), “an integrated linguistic and rhetorical description of the *written medical research article*” highlights the linguistic consequences of textual and discursive organization: this means that the relationship between linguistic choices, stylistic features and rhetorical-discursive context is a fundamental one.

This also means that the authors organize their writing according to the communicative habits and the communicative needs of their time and their audience of experts and/or non-experts alike. Indeed, the lay interest and participation in medical events and their communication is pervasive throughout the century, and medicine continues to be a frequent topic of civil conversation.

4. Results: volumes contents and organization

In the century between 1702 and 1801 (from volume 23 to volume 91), the *PT* include about five hundred medical articles in English (those in Latin represent a minority, particularly in the second half of the century: just 5 out of 26 were published after 1750). About three hundred texts – included those in Latin – belong to the period between 1702 and 1750 (from vol. 23 to vol. 46), whereas between 1751-1801 (from vol. 47 to vol. 91) the number of texts strongly decreases. Moreover, in the last quarter of the century, some volumes do not deal with medical topics and when medical texts are included they are usually long articles but few in number. A significant reduction in the number of medical texts included in the *PT* is evident between 1775 and 1801: during these twenty-five years only about 30% of medical articles issued between 1751 and 1801 are published.

As regards the five volumes analysed, the number of letters included varies in each volume, even though the epistolary form is the most common one used by medical writers of the period to exchange and convey scientific information. Moreover, the length of articles varies greatly across time, from single-page articles to much longer ones: the average length in the first three volumes is about three pages, about seven in volume 67 and about 23 in volume 91. These long articles do not constitute the norm, and they are all included in volume 91. Volumes 35 (1727-1728) and 91 (1801) include 11 and 5 medical articles respectively, but none of them include letters. Volumes 23 (1702-1703), 47 (1751-1752) and 67 (1777) include 8, 18 and 4 medical articles respectively, and each of them also includes letters: 6 out of 8 in volume 23, 9 out of 18 in volume 47, and 2 out of 4 in volume 67. In the first half of the century, letters embrace medical contents and the writers use a more personal style than they do later on: in volume 67 letters do not embrace medical contents, they are short, institutional cover letters simply introducing topics. The writers are far less involved in the accounts.

Most of the articles convey practical information, without any theoretical frame: they are rich in details, particularly those related to first-hand witnessing.

In the following section, a selection of extracts drawn from the five volumes is used as the basis for a detailed discussion of stylistic features and their discursive effects.

5. Discussion: Stylistic features in context

This section includes two sets of extracts: the first group exemplifies and contextualizes the linguistic and stylistic features; the second group

principally concerns the structure and the rhetorical and discursive elaboration of medical articles.

The first example is an unplanned and situation-dependent 'account', reflecting the emotion and the memory of the author-writer-witness (author-centered approach), since it records his personal and familiar experience:

(1) Author-centered rhetoric

In your last [letter] you desired an account of my Father's Cancer, which I send you, as near as I can remember, it being 20 years since he dyed, and I being then but young, [I] could not make those remarks upon it, as another might have done, and it's possible [I] might forget something material too.

It took its rise from a small bruise on the *Os Jugale*, and in process of time spread it self over the whole Cheek; [...] it ulcerated his Eye round, which I saw him take out with his own hand; and afterwards extended it self to his Ear, and through his Cheek into his Mouth, and across the upper part of his Nose, and perforated the Bone there: It likewise overrun that side of his Forehead, fouling the *Os Frontis*, which came away in pieces [...] the *Cranium*, in a few days putrified and exposed the Brain it self, and several portions of it came away [...].

This to the best of my remembrance is the summ of all. (PT 1702-1703, 23: 1069-1070)

This extract highlights a conversational-'dialogic' style and social (face-to-face) interaction within the disciplinary discourse community but also a friendly-involved relationship with the interlocutor (civil manners of conversation), opening and closing the passage: *In your last, you desired, I send you, [...] This to the best of my remembrance is the summ of all.* The second paragraph is the 'account proper' in narrative style, whose main features are represented by the use of the 3rd person singular pronoun for the father (*his/him*) and for the Cancer (*it/its/it self*), which is at the heart of the narration; dynamic verbs in the past tense (perfective aspect: *took, spread, ulcerated, extended, perforated, overrun, came away, putrified, exposed, came away*) describe the subsequent steps in the process of physical dissolution, given as a series of hallucinative images. The text is not cohesive at all: the topic *cancer* (full-noun) is used just once and then substituted by the pronouns *it, its, it self*, also used to refer to the 'brain' (*it self, it*). The attention is focused on the observer-reporter and not strictly on the object.

The second example actually includes two extracts on dissection (the 1st dated 1702-03; the 2nd dated 1752) and emphasizes the shift from an author-centered orientation to a more and more detached attitude in the observation, account and description of the medical event:

(2)

(a) Dissection – author-centered orientation (1702-1703)

The Case being not very usual, I applyed my self [...] in order to Dissect him; which [...] I did the next day. Finding the Liver only something larger than ordinary, I immediately made search from the *Ventriculus* quite to the lower end of the *Intestinum rectum*: The *Ventricle* was considerably extended, a little space from the Gut *Ileon*, in the *Jejunum*, I found [...] I then proceeded to the Gut *Ileum*, I found a considerable part of it very livid, [...]. I found [...] I found another large ruption [...].

There was some other small matters to be seen, not worth while for me to mention to you. However, Sir, this being matter of fact, as a great many of his Relations can testifie, they being present, I thought fit to acquaint you with it. (PT 1702-1703, 23: 1245)

(b) Dissection – ‘concise accumulation’ (1751-1752)

That day we had him open’d. The lungs were found full of blood. Water in the *pericardium* in the usual quantity. The blood in both ventricles of the heart fluid. The *oesophagus* without any morbid appearance [...]. The *aspera arteria* full of such frothy substance as came from his mouth. The stomach fill’d with liquor, notwithstanding the small quantity he had drank [...]. No other parts were examined. (PT 1751-1752, 47: 414)

Extract (2a) is completely author-centered and written in narrative-descriptive style: the writer accounts for the several steps in the process of dissection as they emerge and are determined by his own choice, for example *I applied myself, I did the next day, I immediately made search, I found, I then proceeded, I found*, etc. It is a discovery process, strictly situation-dependent: *The case being not very usual*. The last paragraph goes back to the conversational style of civil and social interaction (*not worth while for me to mention to you, I thought fit to acquaint you with it*) and highlights the truthfulness of the report itself, a rhetorical strategy which plays a key role in eighteenth-century medical communication and ethics (*this being matter of fact*).

In (2b) the shift is clearly marked and new stylistic features, such as the 1st person plural pronoun referring to the disciplinary community and the actual team carrying on the dissection and the deletion of linking verbs (the verb to be is reduced to \emptyset), are introduced: *Water in the pericardium, the blood [...] fluid, the œsophagus without, the stomach fill'd*, etc. The effect is that of concise accumulation, listing and clustering of results between two dynamic poles constituting the rhetorical framework: *we had him open'd [...] No other parts were examined*.

Example 3 is an extract from a short account opening the last quarter of the century and marking a further shift towards a more abstract, object-oriented attitude in elaborating medical discourse:

(3) Abstract object-oriented attitude (1777)

The conjecture that had been formed about the complaint in the bowels proved to be [...]. Certainly these were some signs of a slight inflammation having attacked the membranes investing the contents of the thorax.

Neither can we suppose such appearances to have existed without occasioning some uneasiness: they were, perhaps, sufficient to account for that great tenderness and oppressive pain which the doctor felt from the least pressure on the sternum, or upon any part of the breast near it.

The principal seat of the disease which proved so tedious, and in the end so fatal, was, no doubt, confined to the colon only; [...]. The part first affected must have been that portion of the canal in which we observed the most mischief.

The superficial extent of the disease over so large a surface as the whole arch of the colon, [...] distinguished the part [...]. (PT 1777, 67: 610-612)

Lexico-grammatical features are particularly interesting here, especially nominalizations which transform dynamic verbs (processes) into entities, and reduce grammatical intricacy: *the conjecture that [...] proved, a slight inflammation having attacked*, etc. They are used to thematise the central content of the discussion and organize the transitivity structure.

As regards morpho-syntactic features, the main strategy is the use of complex phrases whose head nouns and adjectives are post-modified by a series of syntactic units emphasizing more elaborate and detailed conceptualizations. Post-modification is realized by full relative clauses

(*the conjecture that, oppressive pain which, the disease which, the canal in which*), reduced relative clauses (*inflammation having attacked the membranes investing the contents, the part first affected*), non-finite to-infinitive clauses (*appearances to have existed, sufficient to account for*), prepositional phrases (*about the complaint in the bowels, signs of a slight, the contents of the, [...] from the least pressure on the sternum, or upon any part of the breast, the principal seat of the disease, extent of the disease over so large*).

Some other rhetorical devices, particularly hedging, highlight manners and tentativeness in discourse: *Certainly, neither can we suppose, perhaps, no doubt, must have been*.

In general terms, we move toward an increase in the usage of embedded items within a complex recursive structure.

The second set of examples principally concerns the organization of the scientific-medical article. Structural-discursive features may be found as isolated hints in the first half of the century, with an increase in more institutionalized articles under Newton (1703-1727), but they acquire more definite status towards the end of the period, particularly after 1777.

These features include introductory paragraphs (4a and 4b, and 6: topicalization, background information, definition, dispute), and concluding paragraphs (5a and 5b and 6: generalization and abstraction, further research):

(4)

(a) Setting the scene: introductory sections – Aneurysm 1

AN Aneurysm, without Doubt, is a Tumor arising from some Disorder in an Artery; but what that Disorder is, or whence it arises, is not so well agreed, the Accounts which are given of it, being widely different and uncertain.

The Name seems to imply, that it is a Dilatation of the Vessel; [...]. (PT 1727-1728, 35: 436)

(b) Setting the scene: introductory sections – Aneurysm 2

An Aneurysm is by all Authors defin'd to be a soft circumscrib'd Tumor, in which there is a sensible Pulsation, contemporary with the Pulsation of the Artery, to which it adheres.

As it is certain, that any Tumor of what Kind soever, lying on, or adhering to any considerable Artery, must necessarily be moved by every Pulsation of such Artery, so this Pulsation (unless understood

in such Manner as I shall hereafter explain) can no ways be admitted as the true Diagnostick, whereby to specify the Difference between this kind of Tumor and any other.

An Aneurysm is found, [...]

It is obvious that, [...].

(PT 1727-1728, 35: 440-441)

The two texts show that the topic is

- 1) emphasized, that is thematized, and that the discussion is not situation-dependent (*An Aneurysm [...] is, An Aneurysm is*);
- 2) defined, to make the discussion start, by delimiting and clarifying as regards the topic (*is a Tumor arising from, The name seems to imply, it is a Dilatation of the Vessel, is [...] defin'd to be [...] a soft*);
- 3) contextualized within the disciplinary background of a disciplinary community (*An Aneurysm, without doubt, is [...], An Aneurysm is by all Authors defin'd to be, As it is certain, It is obvious that*); and
- 4) problematized, particularly when putting forward new viewpoints and even critical and/or opposing approaches concerning previous ideas (*what [...] or whence [...] is not so well agreed; the Accounts [...] being widely different and uncertain; and Pulsation (unless understood in such manner as I shall hereafter explain) can no ways be admitted as the true Diagnostick*).

Textual cohesion is mainly enhanced by lexical repetitions (*Aneurysm, Pulsation*).

As regards concluding remarks, the two sets of examples are dated 1702-1703 and 1727-1728, respectively at the beginning and at the end of the Newtonian period. This chronological difference marks some rhetorical and stylistic differences between them:

- (5)
 - (a) Generalization in concluding remarks 1 (isolated hints, 1702-1703)

The consequence of their coming off shews, that they caused the Jaundice in those two persons I have mentioned, by obstructing the Channels thro which the Bile passeth from the common receptacle into the *duodenum*. (PT 1702-1703, 23: 1582 [1282])

From hence we come to understand how the *Itch* proves to be a Distemper so very catching; [...]. (PT 1702-1703, 23: 1298)

This and other instances, make me easily concur with some Physicians in an Opinion, that in some Families the Lungs have originally a more tender Constitution than in others. (PT 1702-1703, 23: 1384 [1378])

- (b) Generalization in concluding remarks 2 (more structured conclusions, 1727-1728)

Since then it is evident that *Fistula's* in all parts of the Body are dilatable to a great width, since Nature is often able of herself to dilate the very parts in dispute, to a very extraordinary Degree; [...].

Therefore *Artificial Fistula's* in Males and the *Urethra* of Females may be dilated so as to extract any Stone without cutting the Body of the Bladder, or lacerating any of the Parts. (PT 1727-1728, 35: 322)

The 1703 set is characterized by deductive expressions marking a certain degree of abstraction, such as *The consequence of, they caused, From hence, the Itch proves to be, easily concur*, but also by an author-centered approach. Expressions such as *I have mentioned, we come to understand, make me easily concur* still emphasize an involved attitude in an effort to introduce more abstract considerations.

In contrast, the 1727 extracts show a more institutionalized and abstract orientation. Condition-consequence structure is emphasized by thematized connectors which clearly contextualize the nature and the function of the paragraph they open: *Since then, Therefore*. Expressions such as *it is evident that, Artificial Fistula's [...] may be dilated* mark a shift from an author-centered to object-centered perspective.

The last example is drawn from a paper published in the 1801 volume. The situation has changed completely: from personal reports at the very beginning of the century, to definitely structured Introduction-Method-Results-Discussion (Conclusions) at the end of the period considered. The two following extracts represent the introductory and the concluding sections of a long and elaborate article (about 20 pages), a research paper, as it is designated within the text itself:

- (6) Paper

[Introduction]

The nerves have been hitherto considered as chords that have no powers of contraction within themselves, but only serving as a medium, by means of which the influence of the brain may be communicated

to the muscles, and the impressions made upon different parts of the body conveyed to the brain.

The difficulties which attend every attempt to investigate the real state of the nerves in the living body, and the impossibility of acquiring any information upon this subject after death, may be urged in excuse for this opinion having been so universally received, since it will be found, from the following experiments and observations, to be void of foundation.

The only means by which any knowledge respecting the irritability of nerves can be procured, must be from the operations in surgery performed upon nerves, either in a healthy state, or under the influence of disease; or from experiments made upon animal bodies before they are wholly deprived of life, and instituted for that particular purpose.

My attention was directed to this subject by the following case, which explains many circumstances respecting the actions of the nerves when under the influence of disease, and gave rise to the experiments and observations contained in this Paper. [...]

[*Body*]

[*Conclusions*]

The experiments and observations which have been related, appear to illustrate an action in the nervous chords, capable of producing the symptoms which occurred in the case related in the former part of this paper, and also those met with in many other diseases, the symptoms of which have never been satisfactorily explained. [...]

To enter further into the histories of cases which afford evidence of a morbid action in the nerves, would be trespassing too far upon this learned Society, and would render the present Paper an inquiry into medical facts, which is only intended to be an investigation of the natural actions of the nervous fibres, illustrated by the phaenomena which occur while these chords are under the influence of disease. (PT 1801, 91: 1-2, 19, 22)

In the introduction four different steps may be recognized. The opening paragraph introduces the topic (*nerves*) and the background (*have been hitherto considered as*); the author and the research project are placed within the disciplinary community. The following paragraph, instead, after a long and elaborate apologetic hedging (starting with *The difficulties* and ending with *in excuse for this opinion having been so universally received*), introduces

an oppositional-argumentative approach to put forward a new research perspective, since the previous one *will be found, from the following experiments and observations, to be void of foundation*. The author and the research project are placed inside the disciplinary community with a different perspective. The third paragraph introduces the only possibility to solve the dispute: *The only means by which any knowledge [...] can be procured, must be from the operations in surgery [...]*. A different perspective seems inevitable: there is a research gap and the author is keen to try to fill it with further experimentation. This, at least, seems to be his aim. Finally, the closing paragraph focuses on the present research and the inevitability of the attempt: *My attention was directed to this subject by the following case, which [...] gave rise to the experiments and observations contained in this Paper*. In this case, the author tries to make his research accepted by his audience-readership of experts.

The concluding section of the paper is less elaborate than the introductory section, and it may be sub-divided into two steps. The first can be traced back to the introduction, and it summarizes, with the same words, the intentions expressed in the plan of the article. Now these intentions have definitely been carried out, *The experiments and observations which have been related, appear to illustrate* (in other words 'demonstrate') the new perspective and further changes in medical knowledge.

The closing paragraph may actually be considered as a follow-up paragraph, suggesting further research. It delimits the scope of the paper itself to lower the risk of non-acceptability: *To enter further [...] would be trespassing too far upon this learned Society, and would render the present Paper [...]*. While delimiting the investigation on the nature of the nerves, the author encourages further inquiry into *medical facts: [...] would render the present Paper an inquiry into medical facts, which is only intended to be an investigation of the natural actions of the nervous fibres*.

6. Concluding remarks

The investigation has demonstrated that between 1702 and 1801 medical writing in the *PT* undergoes major changes. In general, these changes appear to be gradual shifts along a continuum highlighting an essentially author-centered approach at the outset of the century and an object-centered perspective at the end of the period. In particular, the movement is from a personal, involved, emotional perspective to an informational one; from a descriptive-narrative style to a descriptive-argumentative one; from observations on what happens from a situation-dependent perspective in single case studies (by single physicians and/or practitioners) to elaborated

discussions. In this context, medical communication is characterized by a more general and abstract orientation emerging from more planned and structured articles whose introduction, body (description and discussion) and conclusion are clearly framed.

Observation and experimentation are at the heart of eighteenth-century medical experience, and step-by-step reports characterize medical writing throughout the period. However, change is not systematic across time since periods of increase and decrease in the use of specific features and rhetorical strategies may alternate. On the whole, these features overlap and/or coexist; what varies is their frequency of use in the texts analysed.

Epistolary writing and narrative style in medical writing are pervasive until about 1775: they were typical communicative strategies in genteel social interaction, largely adopted in scientific writing. According to Atkinson, letters attest to the “pervasive genteel social ethic and its adoption into [...] the rhetoric of science” (Atkinson 1996: 363). Ultimately, they reflect the civil and polite society which represented the readership of medical knowledge. The last quarter of the century marks a turning point, since the British Medical Reform enhanced the professionalization and diversification of medical education and practice; this definitely changed the way medical knowledge was elaborated and conveyed. Moreover, peer review, which was introduced in the *PT* in 1752, as well as the establishment of medical journals in London towards the end of the century, further stimulated the standardizing of medical research articles.

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