

Conversation and Argumentation in Boyle's Scientific Dialogue

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Abstract

The aim of this paper is to illustrate the new stylistic approach embodied in the genre of the scientific dialogue as used in 17th-century England, focusing, in particular, on the strategies adopted by Robert Boyle in *The Sceptical Chymist* (1661). The purpose of our analysis is, on the one hand, to point out those characteristics which make this dialogue resemble the features of normal conversation and, on the other, those that instead have a more argumentative purpose and that therefore make it more similar to the other genre typical of scientific theorisation, i.e. the treatise.

Key words: scientific dialogue, Robert Boyle, *The Sceptical Chymist*, 17th-century England, conversational features, argumentative strategies, treatise.

Introduction

The great epistemological and methodological innovations that took place in 17th-century England (Vickers 1987; Hunter 1989; Jardine 1999; Shapiro 2000) determined the need for corresponding adjustments both as regards the methods of communicating information about new scientific discoveries and as regards the most suitable means of expression chosen to describe and discuss the new phenomena then being observed and analysed. This new perspective determined not only the creation of more innovative genres such as the experimental essay (Gotti 2001), but also the reformulation of traditional genres, such as the treatise and the dialogue.

The aim of this paper is to illustrate the characteristics of this stylistic reformulation as embodied in the genre of the scientific dialogue. In particular, the paper focuses on the expository and argumentative strategies adopted by one of the most influential innovators of that period, i.e. Robert Boyle, drawing comments and examples from *The Sceptical Chymist* (1661), written in a dialogic form. The purpose of our analysis is, on the one hand, to point out those characteristics which make this dialogue resemble the features of normal conversation and, on the other, those that instead have a more argumentative function and that therefore make it more similar to the other genre typical of scientific theorisation, i.e. the treatise.

Boyle's Choice of the Dialogic Form

The dialogue, mainly derived from the Platonic tradition, was a very popular form of composition used both in literary and non-literary contexts in the Early Modern English period (cf. Merrill 1970; Marsh 1980). Boyle's choice of the dialogic form to embody his considerations in *The Sceptical Chymist* does not represent a confirmation of a tradition-

al writing procedure of his, as this is the only printed work composed by him in this form. His other works, in fact, appeared in other guises, mainly in that of the treatise and of the experimental essay. The choice of the dialogue as the genre for this work, therefore, is to be taken as the result of a series of careful stylistic choices on the part of the author. The confirmation of this hypothesis can easily be found in the examination of the pragmatic purposes of this work, which differ from those of others by the same author. Boyle's other writings, in fact, generally aim at expounding some new theoretical argumentations conceived by the author or at reporting the details and the results of a particular experiment carried out by the British scientist; it was therefore fully appropriate for Boyle to recur to the genres respectively of the treatise and of the experimental essay to carry out those specific pragmatic functions.

The main purpose of *The Sceptical Chymist*, instead, is not the assertion of a new theory, but a critical analysis and confutation of the principal theoretical statements put forth by preceding and contemporary philosophers and men of science as regards the basic elements that constitute physical substances representing matter. Boyle's willingness to point out the inconsistency and inadequacy of such theoretical assertions is confirmed by the subtitle of this work,¹ in which the author takes care to warn the reader that the ideas put forth in it are to be taken as **doubts and paradoxes** about existing theories. The lack of pretension to theoretical innovation on the part of the author is clearly expressed by his choice of the lexeme *Notes* to refer to the observations that Boyle draws from his own experiments to support his criticism of both the Aristotelian and the Paracelsian views concerning the main physical elements. A confirmation of the mainly critical attitude taken throughout this work is provided by Boyle himself, when he makes his main character assert that "'tis not so much [his] present Talk to make assertions as to suggest doubts" (p.356).² Boyle is fully aware that his suppositions and intuitions cannot yet aspire to the consistency and reliability of sound theoretical principles. At the moment, therefore, all he can do is only express his doubts and reservations about the principles commonly shared by the scientific community. The rhetorical form which he considers the most appropriate for the expression of his reservation without giving the impression of aiming at a more formal and pretentious kind of treatise is the dialogue, which enables the author to put forth his observations in a more informal way, resembling a tranquil, polite conversation among learned people.³

Apart from the possibility of greater consistency between stylistic form and pragmatic function, there is another reason which might explain Boyle's choice of the dialogue, which consists in the advantage that such a genre offers the author of expounding his ideas in an indirect way and of thus offering him some sort of protection against public criticism.⁴ The dialogic form, in fact, enables the author to attribute his views to different characters, who however cannot be identified directly with the author himself. Boyle's willingness to distance himself from the opinions expressed by the various speakers in *The Sceptical Chymist* is clearly pointed out in the preface to his work:

Nor needed I make the Interlocutors speak otherwise than freely in a Dialogue, wherein it was sufficiently intimated, that I meant not to declare

my own Opinion of the Arguments propos'd, much lesse of the whole Controversy itself, otherwise than it as it may by an attentive Reader be guess'd at by some Passages of Carneades: (I say, some Passages, because I make not all, that he says, especially in the heat of Disputation, mine). (p.212)

Moreover, the choice of Carneades as the main character of *The Sceptical Chymist* emphasizes the dialectical freedom typical of the sceptical dialogue⁵ which grants each speaker the possibility of maintaining and defending his own opinion, without being bound by the fetters of traditional authority. The link with this type of dialogue, established by the choice of that character and the open attitude that characterizes it, allows the author to make use even of conflicting arguments in his search for truth. Another rhetorical device which Boyle takes advantage of to distance himself from the opinions expressed in his work is the presentation of the narrator as a modest person, who humbly listens to the other speakers rather than presenting his own views. In the dialogue, in fact, Boyle identifies himself with the narrator, who is presented as the least expert of the participants as regards the matter under discussion, and who is relegated therefore to the mere role of listener and learner:

I conscious to my own Disability's told them resolutely that I was as much more willing as more fit to be a hearer than a speaker; among such knowing Persons, and on so abstruse a Subject. ... I added, that I desir'd not to be idle whilst they were employ'd, but would if they pleas'd, by writing down in short hand what should be delivered, preserve Discourses that I knew would merit to be lasting. (p.217)

Of course, Boyle's ignorance of the subject is only an excuse, as the British scientist is quoted by Carneades on several occasions as an authority in the field, and the results of his experiments are often mentioned as evidence for many objections and criticisms. This humble role which the author devises for himself is therefore part of a rhetorical design,⁶ which is meant to protect the author from public attack.

The Sceptical Chymist has another purpose, which concerns the identification of the most appropriate style for scientific discussions. This metatextual intention is confirmed by the author's own words:

And indeed, I am not sorry to have this Opportunity of giving an example, how to manage even Disputes with Civility. (p.212)

From this sentence, we can see that the expression used to qualify the style to be adopted in scientific argumentation is *with civility*. As a matter of fact, the adjective *civil* is frequently used in this work to define not only the language to be used, but also the tone to be adopted and the relationship to be maintained with interlocutors. Boyle's insistence on **civility**⁷ as a distinctive feature of scientific exposition was meant to emphasize

an important change that was taking place within the scientific community (Gotti 2013). Scientific matters were attracting wider interest, especially among aristocratic and cultured people, and they were separating this select group of people, who found their proper identification in the newly-founded Royal Society, from the less learned group of non-scientific practitioners. Boyle was very pleased with this widening of the community of scientists among the nobler minds of the period⁸ but clearly perceived that the causes of differentiation of this group from that of practitioners was not only methodological and conceptual, but also linguistic and stylistic. Thus the choice of the dialogic form to embody this work is meant to assist Boyle in exemplifying the civility that scientists ought to adopt in their discussions. Indeed, this form would provide a natural way of presenting opinions and evaluating objections within a scientific discussion in a cooperative and respectful atmosphere thus highlighting the politeness values (Klein 1994) typical of conversation between gentlemen.

Conversational Features

In order to make his dialogue more effective, Boyle endows it with features typical of a real conversational exchange. First he invents appropriate characters and assigns a specific role to each of them. As mentioned above, to allow himself complete freedom in the expression of his criticisms the British writer does not designate himself as the main character, but assigns this role to Carneades. The choice of this name is not at all a casual one, as the role which Boyle attributes to this character is the same as the one actually played by the Greek philosopher in his time, as he is “to play the Antagonist and the Sceptick [... and] to Suggest doubts against the Opinion he questions” (p.210). The use of this historic character can help Boyle defend himself from the accusation of inconsistency as it is part of Carneades’ method to evaluate opposing points of view concerning a certain topic. The main character of *The Sceptical Chymist*, in fact, is not expected to put forth a consistent new theory, but “to propose two or more severall Hypotheses about the same thing; And to say, that it may be accounted for this way, or that way, or the other Way, though these wayes be perhaps inconsistent among Themselves” (p.210).

There are three more characters in the dialogue apart from Carneades and the narrator: Eleutherius, Themistius and Philoponus. The links of the latter two with the philosophical tradition makes them suitable means to expound the theoretical positions of two important schools of thought, that is, respectively the Aristotelian and the Paracelsian. Eleutherius instead is assigned the role of the **inquisitive** person who is to stimulate Carneades to express his opinions and objections. In assigning different roles to various characters, Boyle likens his dialogue features to those of a scientific discussion, in which his characters are to embody different theoretical positions and express contrasting points of view. The interactive aspect of the dialogue is thus identified in the contrast among the theoretical statements characterising opposing scientific and philosophical schools.

In spite of the fictitiousness of this interaction and the contrived roles of its participants, Boyle tries to confer a certain degree of realism to his dialogue by providing a particular contextualization to the conversations that take place in it. At the beginning of the dialogue, in fact, Boyle carefully sets the scene, specifying both the place and the time

of the beginning of the narration. The dialogue takes place “on one of the fairest dayes of this Summer” (p. 215), when the narrator, who is at home, receives the visit of his friend Eleutherius. The following scene too is representative of Boyle’s desire to provide a detailed contextualization of the conversation between Carneades and his friends. The former is described as being in “one of the Arbours in his Garden”, where he has retired “to enjoy under its cool shades a delightful protection from the yet troublesome heat of the Sun” (p.216). This cool, quiet setting is thus introduced as ideal⁹ for the scientific discussion the learned men are going to take part in.

Also the characterisation of the participants is fairly accurate. Indeed, Boyle frequently introduces skillful descriptions of actions that one might consider irrelevant in the general view of the dialogue, but which however are useful in helping the reader identify the true nature of the various characters. For example, the first presentation of these characters is accompanied by appropriate contextualization, as these philosophers are portrayed “sitting close about a little round Table, on which, besides paper, pen, and inke, there lay two or three open Books” (p.216). The careful description of the scene is completed by the faithful report of the reactions of these characters to the arrival of Eleutherius and the narrator:

Carneades appeared not at all troubled at this surprise, but rising from the Table, received his Friend with open looks and armes, and welcoming me also with his wonted freedom and civility, invited us to rest ourselves by him; which, as soon as we had exchanged with his two Friends (who were ours also) the civilities accustomed on such occasions, we did. And he, presently after we had seated ourselves, shutting the Books that lay open, and turning to us with a smiling countenance, seemed ready to begin some such unconcerning discourse, as is wont to pass or rather waste the time in promiscuous companies. (p.216)

The five characters are then made to start their **Philosophical conference** (p.216), which is described with the accurate insertion of those features of **due decorum** that pertain to a discourse “wherein only Gentlemen are introduced as speakers” (p.212). The description of such polite manners, however, does not make the narration artificial or pedantic, as Boyle also inserts appropriate comments and actions to attribute particular concreteness and vividness to the characters’ behaviour. The following passage, for example, reports Eleutherius’ reaction to the formalities employed by his colleagues, and highlights his more practical spirit:

Philoponus and Themistius soon returned this complement with civilities of the like nature, in which Eleutherius perceiving them engaged, to prevent the further loss of that time of which they were not like to have very much to spare, he minded them that their present businesse was not to exchange complements, but Arguments. (p.219)

The subsequent progress of the debate represents the realization of a typical scientific dispute, whose final outcome is made to coincide with the persuasion of the other characters on the part of the main one. Boyle's dialogue follows the rules typical of polite conversation among gentlemen,¹⁰ according to which participants take it in turns to speak in an appropriate way, paying compliments to the previous speaker even when they are disagreeing with what he has just said. Boyle is aware that as arguing typically implies disagreeing with another interlocutor, argumentation is a highly face-threatening activity which may greatly endanger social relations (Brown and Levinson 1987). However, the **civility** corresponding to a real gentleman's discourse should imply the adoption of a fair attitude towards his interlocutors, and respect for the people whose opinions he is arguing against.¹¹ He thus indicates the correct behaviour of a person who is trying to convince other people of the rightness of his ideas:

A man may be a Champion for Truth, without being an Enemy to Civility; and may confute an Opinion without railing at Them that hold it; To whom, he that desires to convince and not to provoke them, must make some amends by his Civility to their Persons for his severity to their mistakes; and must say as little else as he can, to displeas them, when he says, that they are in an error. (p.212)

What distinguishes a gentleman's behaviour, therefore, is his respect for the person whose views he is criticising and his limiting his objections to the points he sees as incorrect without any unfair recourse to excessive aggressiveness.¹² According to this view, *ad hominem* argument is deemed unacceptable, as criticism should be directed towards the debated matter rather than the opponents.

Boyle's dialogue contains the elements which are typical of conversational argumentation (cf Muntigl and Turnbull 1998) and its most frequent speech acts are those of making claims, disagreeing with claims and countering disagreements. Claims are often strengthened by discourse markers expressing emphasis, as is the case of *I say* in the following quotation:

And since especially there is a manifest Analogie and Resemblance betwixt the bodies obtainable by Chymical Anatomies and the principles whose names are given them; I have, I say, consider'd that these things may be represented: [...]. (p.305)

Disagreements with claims and countering disagreements, however, are expressed in a **civil** manner. The following quotation is an instance of disagreement with a previous claim which is expressed in a very cautious way using hedging and a counterfactual conditional:

I halfe expected, Carneades, that after you had so freely declar'd Your doubting, whether there be any Determinate Number of Elements, You would have proceeded to question whether there be any Elements at all. (p.344)

Also when the objection is made more directly, it is formulated in such a way as not to hurt the interlocutor's feelings:

But (says Eleutherius) me thinks for all this, you have left some part of what I alledg'd in behalf of the three principles, unanswer'd. (p.339)

The civility of the formulation of a disagreement also finds confirmation in the tone of its reply, in which the first speaker, even when objecting to the counterclaim, is grateful to the person who expressed it:

Nor do I Doubt, but you'l excuse me, if as I thank the Chymists for the things their Analysis shews me, so I take the Liberty to consider, [...]. (p.278)

In the following example, instead, the narrator is very keen to underline Carneades' lack of irritation by remarking that his reply to disagreement is given with a laugh:

I never denyed (Replies Carneades) that the Notion of the Tria Prima may be of some use, but (continues he laughing) by what you now alledg for it, it will but appear That it is useful to Apothecaries, rather than to Philosophers, [...]. (p.339)

The **civility** of the tone adopted is often emphasised by the use of appropriate politeness phrases:

But I think I could shew You, if You would give me leave, that this will prove only that the Elements as You call them, are the chief Bodies that make up the neighbouring part of the World, [...]. (p.225)

This frequent adoption of polite expressions sometimes suggests an impression of unrealistic use of the dialogic tool in *The Sceptical Chymist*. This impression is confirmed by the fact that the speakers' turns are quite imbalanced, with frequent and long turns taken by Carneades and sporadic and much shorter sentences uttered by his interlocutors. Only in some parts of the dialogue does the conversation acquire more realistic features, with the characters taking turns in a more natural way. In certain cases, in fact, the succession of the characters' lines is made more vivid by spontaneous interruptions, such as in the following passage:

But as Carneades was going to do as he had said, Eleutherius interrupted him, by saying with a somewhat smiling countenance: [...]. (p.278)

At times interruptions are somewhat brusque, and make the interaction sound more similar to direct speech:

What Helmontian Opinion, and what Arguments do you mean? (asks Carneades). (p.258)

In general, turns clearly follow one another, sometimes neatly divided by pauses and silence:

Themistius having after these last words declared by his silence, that he had finished his Discourse, Carneades addressing himself, as his Adversary had done, to Eleutherius, returned this Answer to it. (p.223)

Claims and counterclaims usually follow each other smoothly. On some occasions the words of one character are perceived by the other as a stimulus for his own intervention in the conversation:

You recall to my mind (says Carneades) a certain Experiment I once devis'd. (p.283)

The presence of the interlocutor(s) is often made explicit by a clear reference to him/them through the use of the second person pronoun form or his/their proper name(s):

For I, and no doubt You, have long observed, that those Dialectical subtleties, that the Schoolmen too often employ about Physiological Mysteries, are wont much more to declare the wit of him that uses them, then increase the knowledge or remove the doubts of sober lovers of truth. (p.219)

But I have already intimated, Eleutherius, that I shall not Insist on this Experiment, not only because, having made it but once, I may possibly have been mistaken in it; but also [...]. (p.251)

At times, the speaker's direct reference to his interlocutors is meant to guide their decoding activity and thus strengthen his perlocutionary action:

But I must here profess, and desire You to take Notice of it, that though I pass on to another Argument, it is not because I think this first invalid. (p.225)

To convey the impression of greater colloquialism, some of the turns are made to start with an interjection or an exclamation:

Nay, for a further Confirmation of this Argument, I will add this Strange Relation, that two Friends of mine, the one a Physitian, and the other a Mathematician, and both of them Persons of unsuspected Credit, have solemnly assured me, that [...]. (p.266)

Now, if Chymists will agree to call the dry and sapid substance salt; the Unctuous liquor Sulphur; and the other Mercury; I shall not much quarrel with them for so doing [...]. (p.306)

Argumentative Features

The stylistic choices made by the author often lead him to privilege the argumentative aspects of his dialogue rather than the conversational ones so that in many parts the work looks more like a treatise than a real oral interaction. Indeed, the way scientific exposition is structured in the dialogue greatly derives from the stylistic principles presented by the author in this same work. According to these principles, Carneades expounds his observations in a very orderly way, taking care to make use of all possible rhetorical means to favour his interlocutors' decoding of his words. Each consideration is usually illustrated by means of suitable examples, and supported by appropriate evidence derived from clearly demonstrated experimental results. As the dialogue has the clear purpose of providing an example of how discussions should be conducted, it is not at all surprising to find throughout the text clear metatextual statements meant by the author to offer friendly guidance to his readers' interpretation. Very frequently, in dealing with a theoretical point, the author emphasizes the structure of his reasoning by means of appropriate comments such as the following:

*To proceed then to my Propositions, I shall begin with this, That (Propos. I.) It seems not absurd to conceive, that [...].
But (continues Carneades) presuming, that the first Proposition needs not be longer insisted on, I will pass onto the second, and tell you that (Propos. II.) Neither it is impossible that [...].
But to proceed to a new Proposition (Propos. III.) I shall not peremptorily deny, that [...].
To these three Concessions, I have but this Fourth to add, That (Propos. IV.) It may likewise be granted, that [...]. (pp.229-232)*

After outlining the structure of his argumentation, the author proceeds to develop it, carefully preceding each step of his reasoning with transparent metatextual statements:

That I may not make this Paradox a Greater then I needs must, I will First Briefly Explain what the Proposition means, before I proceed to Argue for it. [...] That then, which I Mean by the Proposition I am Explaining, is, That [...]. Having thus Explain'd my Proposition, I shall endeavour to do two things, to prove it; The first of which is to shew, that [...]. And the other is to make it probable, that [...]. To begin then with the First of these, I Consider that [...]. (pp.254-255)

Having appreciated the author's care in avoiding redundancy, we should not be puzzled by his summing up the various steps of his reasoning at the end of his treatment of

a main argumentative move. If we consider the length of the argumentation (which in its printed form takes up several pages), it is not at all surprising that the author should provide a recapitulation of his main theses before proceeding. Once again, this process is meant not merely to satisfy the locutor's argumentative needs, but is mainly justified by the wish to help the readers understand his text:

And thus, Eleutherius, (says Carneades) having at length gone through the four Considerations I propos'd to Discourse unto you, I hold it not unfit, for fear my having insisted so long on each of them may have made you forget their Series, briefly to repeat them by telling you, that Since, in the first place, it may justly be doubted whether or no [...]; Since we may doubt, in the next place, whether or no [...]; Since also, [...]; And Since, Lastly, [...]; Since, I say, these things are so, I hope you will allow me to infer, that [...]. (p.326)

Also at the end of the dialogue, the main steps of the debate are repropounded in a shortened form. This time, however, the summary is not provided by Carneades himself, but by Eleutherius to indicate the high degree of cooperation existing in that **civil** group:

Wherefore, if it be granted you, that you have made it probable, First [...]; Next [...]. Lastly [...]. If, I say the Chymists (continues Eleutherius) be so Liberall as to make you these three Concessions, I hope you will, on your part, be so civil and Equitable as to grant them these three other propositions, namely; First [...]. Next [..]. Lastly [...]. (pp.374-375)

This summary concludes with the total acceptance of Carneades' argumentative line. In fact, Eleutherius recognizes the soundness of Carneades' reasonings and acknowledges his superiority over the others. The language used by Eleutherius to express his final considerations belongs to the stylistic variety which can appropriately be considered **civil**, thus showing that, in the process of the discussion, not only have Carneades' epistemological and conceptual suggestions been accepted, but so too have those concerning linguistic aspects. The use of the two adverbs *sincerely* and *subtilly* in the final compliment that Eleutherius pays to Carneades shows his emphasis on both the conceptual and the stylistic aspects of his argumentation:

So that (concludes he, with a smile) you may now by granting what I propose, add the Reputation of Loving the truth sincerely to that of having been able to oppose it subtilly. (p.375)

Conclusion

The analysis carried out in this paper has thus helped us understand Boyle's use of the

scientific dialogue by showing how the choice of this genre was strictly linked with the nature of this work, which was mainly meant to provide a critical analysis and confutation of the principal theoretical statements put forth by the Aristotelians and the Paracelsians as regards physical elements. The examination of the expository and argumentative aspects of this dialogue has pointed out that, on the one hand, Boyle tries to insert those stylistic characteristics which are needed to make this dialogue resemble normal conversation. The dialogue indeed tries to imitate natural speech to some extent by giving reactions to previous turns, repeating parts of them, making explicit reference to the interlocutor and inserting interjections. However, the main part of the work shows an accurate and constant use of those argumentative features that instead are typical of another genre of scientific theorisation, i.e. the treatise. Moreover, the analysis has outlined the fact that the expository strategies employed greatly derive from the stylistic principles expounded by the author in this work, who identifies them by the attribute **civil**.

Generally speaking, Boyle does not seem to take full advantage of the various controversial issues he is dealing with to build up contrasting interactive sequences, with the result that the use of the dialogic genre in *The Sceptical Chymist* often hinders its conversational worth.¹³ This is also due to the methodological choice made by the British writer. In fact, in adopting the style of arguing typical of a sceptical philosopher, Boyle is bound to present the same main character evaluating both the strong and the weak points of each argument, instead of assigning them to different speakers.

In spite of its limitations in the use of conversational features, Boyle's work possesses the characteristics of **mimetic** dialogues typical of Early Modern English, which represent an evolution compared to the scholastic dialogues mainly continuing the Late Modern English tradition as pointed out by Taavitsainen's (1999) analysis, which has been summarised in scalar terms by Culpeper and Kytö in the following table (2010:43):

Table 1. Scalar differences between the dialogic scholastic and mimetic traditions in Early Modern English.

SCHOLASTIC	MIMETIC
less speech like	more speech like
instructional	persuasive
less characterisation	more characterisation
less plot development	more plot development
less entertaining	more entertaining
narrow audience	wide audience

However, Boyle's dialogue shows fewer oral characteristics than those of real conversation and therefore looks less speech-like if compared to the other **spoken** genres of the same period listed in the following table (reproduced from Culpeper and Kytö, 2010:67):

Table 2. Historical genres containing “spoken” dialogue.

DIALOGUE	RECORDED	RECONSTRUCTED	CONSTRUCTED
Less explicit narratorial intervention	Trial proceedings (Meeting records) (Parliamentary journals)	(History, biographies)	Drama Didactic works, i.e. instructional treatises in dialogue form
More explicit narratorial intervention	Witness depositions / accounts	(History, biographies)	Prose fiction

The Sceptical Chymist thus constitutes an important testimony of Boyle’s progress in his writing abilities throughout his career, which can be found in his choice of the dialogic form to embody his **sceptical** treatise and in his selection of appropriate elements with which to endow its various parts. Moreover, this dialogue shows a remarkable example of Boyle’s various proposals – ethical, methodological, linguistic and stylistic – all contributing to provide an example of the main discursive features of scientific discussion as envisaged by the new specialized community of that time. In this way, *The Sceptical Chymist* played a fundamental role in the promotion of these discursive conventions, as it soon became a model for the scientific community of gentlemen that was expanding and becoming consolidated in England in the 17th century.

Notes:

1. The subtitle of *The Sceptical Chymist* is: *Chymico-Physical Doubts and Paradoxes, Touching the Experiments, Whereby vulgar Spagyristes are wont to endeavour to evince their Salt, Sulphur and Mercury, to be the true Principles of Things. To which, in this Edition, are subjoined divers Experiments and Notes about the Producibleness of Chymical Principles.*
2. All the quotations from *The Sceptical Chymist* mentioned in this paper are taken from Hunter and Davis (1999, volume 2).
3. Golinski (1987:61) gives a similar explanation for Boyle’s choice of the dialogic form: “Boyle cast the *Sceptical Chymist* in the form of dialogues, in order to communicate his ideas in a didactically-effective way, while also dramatising the rituals of proper philosophical debate. In his view, the manners of such debate required the strict avoidance of dogmatic theorising. Within such a dramatic structure, the deployment of sceptical arguments undercut the authority of traditional chemical discourse, while avoiding the pressure to explicate theoretical alternatives.”
4. This aspect of the dialogue of protecting the author from public attack is pointed out by Marsh (1980:15) as an important reason for Galileo’s choice of this genre: “The

- caution of the humanists [...] exploited the form of the dialogue in order to avoid recriminations and reprisals from contemporary authorities. [...] As late as Galileo's day, the threat of ecclesiastical authority recommended the dialogue form for treating potentially dangerous topics."
5. However, the goal of Boyle's work is not to promote scepticism as a philosophical approach. As Golinski (1990:384) rightly asserts, "In an appendix to his work, [Boyle] explained that he did not intend to propose scepticism as a philosophical doctrine, the kind of belief in the doubtfulness of all things to which a convinced sceptic might seek to convert his auditors. For Boyle, rather, scepticism was an argumentative strategy, a mode of discourse to be used, as he wrote, on 'occasion' and 'with design' – the design, in this case, being to challenge the authority of the prevalent mode of chemical discourse."
 6. As has been suggested by Shapin (1984), modesty plays an important role in Boyle's writing strategy, and helps the author make his works more convincing and less subject to criticism.
 7. For an analysis of Boyle's conceptualisation of a 'civil style' cf. Gotti (2012).
 8. Here are the words with which Boyle shows his approval of the widening of the scientific community: "For I observe, that of late Chymistry begins, as indeed it deserves, to be cultivated by Learned Men, who before despised it." (p.208)
 9. Markley (1988:41) gives a historical interpretation of this idyllic setting of the dialogue: "In one respect, these images of social harmony are part of Boyle's [...] attempts to promote a positive articulation of shared values about language, science, and social order; in another, they may be seen as necessary fictions designed to paper over the cracks in the fragile civic peace in the years following the Restoration."
 10. The class nature of this politeness feature and its close link with the world of 'gentlemen' have been clearly stressed by Shapin (1994).
 11. This respectful and cooperative attitude is also one of the features which Sprat (1667/1959:92) points out as typical of the behaviour of the members of the Royal Society: "They could not be much exasperated one against another in their disagreements, because they acknowledge, that there may be several methods of nature, in producing the same thing, and all equally good." As Goldgar (1995) demonstrates, this is one of the 'unwritten rules' of behaviour typical not only of the Fellows of the Royal Society but of the scholars who formed the international community that he calls 'the republic of letters'.
 12. The adoption of a 'civil' tone to be used in scientific debate was a common aim shared by all members of the Royal Society: "The emphasis in the works of Boyle, Sprat, and Glanvill is thus on precisely those qualities which minimize passionate debate and rhetorical conflict and which elicit their readers' tacit complicity in, as well as overt acceptance of, their campaigns against the backward languages of fanaticism and the occult." (Markley 1988:40-41)
 13. This is not typical of this genre. In her analysis of medical dialogues of this period, Taavitsainen (1999:262) finds that "Features of natural conversation are present in some dialogues that incorporate speech acts of normal everyday interaction, like apologies, in-

sults, greetings and leave-takings, and other exchanges that belong to personal communication, but this seems to be rare and achieved only in texts by the most skilful writers.”

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Հաղորդակցությունն ու փաստարկումը Բոյլի գիտական երկխոսության մեջ

Մույն հոդվածի նպատակն է ներկայացնել 17-րդ դարի անգլիական գիտական երկխոսության ժանրին բնորոշ նոր ոճական մոտեցում, հատկապես կարևորելով Ռոբերտ Բոյլի կողմից ընդունված ռազմավարությունները: Մույն ուսումնասիրության մեջ հոդվածագիրը մատնանշում է մի կողմից այն որակական հատկանիշները, որոնք կարող են ընդհանուր լինել գիտական և սովորական երկխոսությունների համար, իսկ մյուս կողմից՝ այն առանձնահատկությունները, որոնք, հիմնված լինելով տեսական փաստարկումների վրա, մոտեցնում են վերոնշյալ ժանրը գիտական տրակտատին:

Коммуникация и аргументация в научном диалоге Бойля

Цель данной статьи – показать новый стилистический подход, воплощенный в жанре английского научного диалога 17-ого века, в частности, стратегии, принятые Робертом Бойлом. В статье автор ставит цель указать, с одной стороны, на характеристики, которые приближают этот диалог к обычному разговору, а с другой, те характеристики, целью которых является аргументация, и которые, таким образом, приближают вышеуказанный жанр к научному трактату.