

THE RELATIONSHIP
BETWEEN LITERATURE AND SCIENCE
IN THE NINETEENTH CENTURY
A DISCUSSION OF AN INTERDISCIPLINARY APPROACH

An Essay by
BIRGITT FLOHR

Traditionally, the study of literature aims at the understanding of literary texts. Their meaning, structure, and means of expression are examined and – like the objects of the examination - recorded on huge amounts of paper which then instruct us how to read, interpret, evaluate and appreciate the works of literature. In this undertaking the tools to arrive at such an understanding and the aspects of the text which are put under close scrutiny vary according to the methodological approach chosen by the literary critic. Text-oriented approaches like formalism and structuralism concentrate on the internal mechanism of texts while reader-oriented approaches discuss the active participation of the reader in the realisation of the literary work. Another way to understand literature is the context-oriented approach. Contrary to the former it does not regard the work of art as a separate and self-contained entity but views it as a part of human culture and emphasises the connection of the work of art to this culture.¹ Context-oriented approaches differ depending on the cultural aspect they focus on in their examination. Feminism, for example, is a contextual approach which stresses the connection between gender concepts and literary texts while New Historicism includes a historical dimension into the discussion of texts. All contextual-approaches establish, one way or another, a relation between text and culture and insofar as they enter the territory of a different discipline while doing so they can also be called interdisciplinary approaches. To see literature in the context of history can only be successful when it involves the knowledge of history and literature. To examine philosophical influences on literature requires an understanding of both philosophical and literary texts.

In my discussion of the interdisciplinary approach I want to concentrate on another connection and that is the relationship between science and literature, which leads us even out of the realm of the humanities. The examination of this relationship is based on the assumption that science just as much as literature cannot “be insulated from the general culture of the age”², since both are human activities

¹Mario Kläger, *Einführung in die Anglistisch-Amerikanistische Literaturwissenschaft*, second, revised and extended edition, (Wissenschaftliche Buchgesellschaft. Darmstadt, 1995), p. 26-27

²John A. V. Chapple, *Science and Literature in the Nineteenth Century*, (Macmillan: London, 1986), p. 4

and human constructions. In the case of literature this assumption is, of course, a commonplace and nobody (except an extreme advocate of the death of the author) would deny it. In the case of science the general attitude and especially the attitude among scientists is quite a different one. The difference between science and other human endeavours is often regarded as fundamental insofar as science “aims at the discovery of causes and regularities in the physical world . . . with an existence apart from us”, in other words at objective truth, while the humanities and the arts are said to be concerned with “the way things appear to us, matter to us, and have significance for us”³, i.e. with subjective truth and impressions. In this view science is a human activity but by no means a human construction. Recent philosophies of science, however, have challenged this view. They do not necessarily reject the claim of science to establish some kind of independent truth. What they do say is that the way to arrive at this truth is humanly constructed because it depends on our sensual and mental organisation. Both determine what has long been regarded as objective: experience and observation. Moreover, theories are no longer seen as being solely derived from observation but as concepts which are to a certain degree existing beforehand, thereby guiding and determining observation.⁴ Science is just as constructed as anything else humans do and it is therefore regarded as legitimate to discuss it as a “cultural formation . . . equivalent to any other.”⁵ As two cultural formations among others science and literature take part in a general cultural discourse, and they do so in two ways: on the one hand they actively “constitute and develop our common culture”⁶, in other words they influence it and thereby other parts of the general cultural discourse, while on the other hand they themselves are influenced by different aspects of culture and by the whole cultural discourse. Accordingly, Robin Gilmour points out that “the issues of science, the questions it asks, and the way it chooses to answer them, cannot be separated from the assumptions of the culture at large”⁷, just as “conversely, scientific facts and theories may have a direct influence on those who construct philosophical systems, write novels, or criticise society”⁸. Concerning the influence of literature on science George Levine remarks that “how the culture tells stories, that is imagines its life, subtly informs the way science asks questions, arrives at the theories that reshape the culture that informed them.”⁹ It therefore makes sense, literary critics claim, to examine the influence of literature and science on each other.

³Anthony O’Hear, *An Introduction to the Philosophy of Science*, (Oxford University Press. Oxford, 1989), p. 228

⁴see for example Thomas Kuhn, *The Structure of Scientific Revolutions*, second enlarged edition, (University of Chicago Press: Chicago and London, 1970)

⁵George Levine, *Darwin and the Novelists: Patterns of Science in Victorian Fiction*, (Harvard University Press: Cambridge, MA, and London, 1988), p. 3

⁶Chapple, 1986, p. 19

⁷Robin Gilmour, *The Victorian Period: The Intellectual and Cultural Context of English Literature 1830-1890*, (Longman: London and New York, 1993), p. 142

⁸Stephen Brush as quoted in Levine, 1988, p. 4

⁹Levine, 1988, p. 4

A particularly active field of research in this context has been the relationship of science and literature in the nineteenth century because in this period, especially in the first half of the century, culture was much more unified and “science was very much integrated with the culture of its age.”¹⁰ This has mainly two reasons: First of all science was visibly reshaping society in the form of new technology in such areas as transportation, lighting, communication, medical treatment and mass production.¹¹ In addition to this scientific knowledge was widely available and accessible because it was only on its way of turning into the kind of knowledge that only the initiated can understand. This was the case because “scientists still shared a common language with other educated readers and writers of their time”¹² which means that original scientific texts like Darwin’s *The Origin of Species*, for example, could be read by large parts of society. And even when science became less accessible with the development of highly specialised and technical languages popular presentations of science were produced either by the scientists themselves or by ‘middleman’ between science and popular culture which in turn inspired scientists in their research.¹³ A common discourse was also sustained by the great reviewing journals and periodicals which contained articles on literature, science, theology, philosophy and much more so that readers could find a discussion of a poem by Tennyson on one page and an assessment of Mary Sommerville’s *Connexion of the Physical Sciences* on the next “without any feeling that . . . they were moving to a different kind of discourse.”¹⁴ There existed a huge interest in science in all classes of society and a lot research was conducted by enthusiastic amateurs. Natural History Societies, Philosophical Societies and various kinds of institutes were founded¹⁵ and lectures on science became a popular entertainment¹⁶. In turn scientists were inhabitants of the common culture just as everybody else. They did not live on a desert island or locked away behind laboratory doors without any contact to the outside world. Even Darwin did not live isolated from his cultural community when he travelled on board of the Beagle. He took books with him, regularly received a supply of new ones and visited countrymen during his time on land. Beer describes him as an interested member of his culture who was “immensely alive to concurrent work in a range of disciplines, including not only other directly scientific work but history . . . psychology, and literature . . . Equally, his work was profoundly affected by common concerns.”¹⁷

This cultural situation is taken into account and appreciated when literary

¹⁰Chapple, 1986, p. 6

¹¹Levine, 1988, p. 4

¹²Gillian Beer, *Darwin’s Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*, (Routledge & Kegan Paul: London, 1983), p. 6

¹³Chapple, 1986, p. 5

¹⁴Chapple, 1986, p. 5

¹⁵Chapple, 1986, p. 6-7

¹⁶Gilmour, 1993, p. 8

¹⁷Beer, 1983, p. 10

critics examine the influence of science on literature and vice versa in the nineteenth century. What they find is that the literature of the time responded to particular scientific discoveries and – even stronger – to “great conceptual movements that shift the ways in which we apprehend the very nature of reality”¹⁸. This could happen precisely because science was so much part of the general culture and because it used a common language which was close to that of literary texts.

One of these shifts in the way in which we perceive reality is the cultural movement to the Darwinian worldview which took place in the nineteenth century. It is the subject of Gillian Beer’s *Darwin’s Plots* which examines in its second part the influence of Darwinian (and other) evolutionary thought on literature and its assimilation in literary texts. According to Beer science influences literature because it influences the patterns of storytelling by giving a new pattern to our experience. She claims that “evolutionary ideas shifted … the patterns through which we apprehend experience and hence the patterns through which we condense experience in the telling of it.”¹⁹ This new way of narration involves both the level of theme and the level of organisation. On the level of theme it leads to a focus on growth and transformation, interdependence, struggle for existence and adaptation. On the level of organisation it gives authority to a structuring of narrative which “emphasised cause and effect … descent and kin … and allowed chance to figure as the only sure determinant.”²⁰ This influence is possible because narration and evolutionary theory share similar preoccupations. Both are concerned with time and change and these inherent affinities enable the model of one realm to become the model of another.²¹ But not only ideas moved from science to literature. Chapple notes the ability of important scientific phrases and terms to “float free of their defining contexts … to germinate in strange soil and become part of a completely new ecosystem”²² which is literature. Beer points to the fact that metaphors “move rapidly and freely to and fro between scientist and nonscientist; though not without frequent misprison.”²³

All this is connected to another aspect of the affinity of Darwin’s theory to literature: It is, according to Beer, most of all an imaginative work, because it “cannot be demonstrated sufficiently in any present moment.”²⁴ It is more than a mere description of experience. In Beer’s opinion Darwin shares this with most major scientific theories which go beyond the reach of our senses and “overturn the observable world.”²⁵ This was especially true at the moment when Darwin first proposed his theory. At that moment, Beer points out, it was most fictive

¹⁸Chapple, 1986, p. 4

¹⁹Beer, 1983, p. 8

²⁰Beer, 1983, p. 8

²¹Beer, 1983, p. 7

²²Chapple, 1986, p. 19

²³Beer, 1983, p. 7

²⁴Beer, 1983, p. 8

²⁵Beer, 1983, p. 3

because for the cultural community there was no real fit between the natural world as it was currently perceived and as it was imagined in the theory. This put the theory in a “provisional scope akin to that of fiction.”²⁶ What Beer stresses, then, is the fact that Darwin’s *The Origin of Species* is as much an imaginative narrative as common forms of literature. Accordingly, she speaks of the “imaginative power” of Darwin’s theory.²⁷

It shared a further element with literature, namely that it had to be put into words. These words were part of an existing language which embodied traditional cultural assumptions and had to be used to formulate a theory overturning many of these cultural beliefs. “Darwin was telling a new story”, Beer points out, “against the grain of the language available to tell it in.”²⁸ One example is Darwin’s effort to deal with the issue of intentionality. In his theory intentionality is largely rejected as a concept. Neither a god nor any other force is supposed to work as an agent which guides natural selection. In his formulations of his theory especially in its first edition, however, natural selection serves as an agent in many sentences. It seems to become a guiding principle working for the good of the species. Darwin tried to control this impression by use of the phrase ‘metaphorically speaking’, but the element of intention remains in his words.²⁹

This element leads to what Beer calls the text’s multivalence. She points out that the text is “rich in contradictory elements which can serve as a metaphorical basis for more than one reading of experience . . . Darwinian theory will not resolve to a single significance nor yield a single pattern.”³⁰ This multivalence is also one of the reasons why Darwin’s text could be fruitfully used in other contexts. “The unused, or uncontrolled elements of metaphors such as ‘the struggle for existence’ take on a life of their own. They surpass their status in the text and generate further ideas and ideologies.”³¹

But *The Origin of Species* did not only influence other texts. The road between literature and science is not, as has often been observed by scholars of the field, a one-way. The influence that science exerts on the members of nineteenth-century culture also works the other way: “scientists . . . in their texts drew openly upon literary, historical and philosophical material as part of their arguments”.³² Accordingly, Beer points to the affinity between the organisation of a Dickens novel and that of Darwin’s text. Both share an “apparently unruly superfluity of material gradually and retrospectively revealing itself as order, its superfecundity of instances serving an argument which can reveal itself only *through* instances and relations.”³³ Beer also links Darwin to Milton and the imaginative patterns

²⁶Beer, 1983, p. 3

²⁷Beer, 1983, p. 5

²⁸Beer, 1983, p. 5

²⁹see Chapple, 1986, p. 157

³⁰Beer, 1983, p. 8

³¹Beer, 1983, p. 9

³²Beer, 1983, p. 7

³³Beer, 1983, p. 8

and sequences of narration he shared with his contemporaries.

All this establishes a complex interplay and interconnection between literature and science, both directly and indirectly, via a common cultural background. The understanding of the mechanisms of this interplay is a major aim of this interdisciplinary approach. Beer, for example, hopes to “explore some of the ways in which evolutionary theory has been assimilated and resisted by novelists.”³⁴ One especially interesting aspect of this kind of interplay is the study of “the difficult flux of excitement, rebuttal, disconfirmation, pursuit, forgetfulness, and analogy-making”³⁵ which starts with the act of reading a scientific work and is part of the process of assimilation. She also tries to examine “the process of naturalisation” of Darwin’s theory, that is the movement of his theory “from an ‘as if theory’ to a ‘real description’ ” which becomes accepted as such by his culture.³⁶ Levine thinks that it is necessary to examine “what sort of interplay between scientific and nonscientific discourses characterises their mutual developments.”³⁷ In order to do this he searches for a “sort of gestalt of the Darwinian imagination” which would be “detectable in novels as well as in science”³⁸ as an expression of that interplay and also tries to establish that “what Darwin said was part of a much broader sweep of historical change and was implicated in major non-scientific developments.”³⁹ He is obviously fascinated by the idea “how deeply ostensibly ‘disciplinary’ ideas are embedded in the whole culture” and suggests that there is “a great deal to learn about the separate disciplines in attending to their mutual (and yet divergent) use of such ideas.”⁴⁰ Accordingly, he sees the discipline of “Darwinian theory as a historically locatable response to questions of particular urgency among the Victorians”, i.e. their culture in general, and focuses on the way “Darwin’s real or reputed response to these questions interacted with the responses and forms of nineteenth-century English narrative.”⁴¹ What this aspect of the interdisciplinary approach amounts to, then, is a study of the working of culture. The understanding of literary texts seems to be mainly required because they are a product of culture and a way of cultural communication, although Levine is also confident “that shifting the angle of approach to Victorian novelists throws light on them as well as on the scientists and their culture.”⁴² Literature, however, seems to lose its place as a privileged object of study by the literary critic and becomes one element of culture, even a context itself for the study of science and other cultural activities.

Paradoxically, this does not lead to a devaluation of the literary work but to a

³⁴Beer, 1983, p. 4

³⁵Beer, 1983, p. 6

³⁶Beer, 1983, p. 5

³⁷Levine, 1988, p. 3

³⁸Levine, 1988, p. 13

³⁹Levine, 1988, p. 8

⁴⁰Levine, 1988, p. 5

⁴¹Levine, 1988, p. 2

⁴²Levine, 1988, p. vii-viii

fascinating reevaluation of it. “The most stimulating criticism at present”, Chapple notes in an assessment of the discussed interdisciplinary approach, “assumes a genuine correspondence in ends and means … a basic congruence between the scientific and the literary imagination.”⁴³ The latter is no longer more nonsensical or ‘unrealistic’ than the former. Literature and science, it is proposed, are engaged in a common enterprise. This seems to be especially true for the nineteenth century where, as Levine points out, “even the great aesthetic ideals of fiction writers – truth, detachment, self-abnegation – echoed with the ideals of contemporary science.”⁴⁴ In fact, Levine becomes almost emotional when he states that “the overlap of scientific thought and literary convention is one of the points I want to emphasise and part of the excitement of this enterprise.”⁴⁵ Seen from this point of view literature becomes just as much a source of knowledge as science. Moreover, fiction becomes one of the laboratories of science.⁴⁶ Levine claims that “the Victorian novel clearly joins with science in the pervasive secularizing of nature and society and in the exploration of the consequences of secularization”⁴⁷ And Beer states that Victorian novelists, just as much as scientists, “with varying degrees of self-awareness … have tested the extent to which it can provide a determining fiction by which to read the world.”⁴⁸ What the laboratory of fiction adds to the exploration of scientific concepts is the human factor. Literary texts draw the human inferences from theories science provides and explore them in their narration.⁴⁹

This reevaluation of literature as an undertaking close to science in turn moderates the authority of science. Darwin is seen as an example of the “impurity of scientific ideas”, *The Origin of Species* as a text which is related to a particular historical and cultural situation. It is regarded as a text which “coming from a mode of discourse self-confidently representational and nonfictional … enters into the dubiously representational realms of narrative and fiction” and becomes an object in which the boundaries between the two kinds of representation and narrative are blurred.⁵⁰ All this challenges the authority of science by questioning its rationality. In fact, many studies have been conducted which undermine the purely rational image of science by stressing “the crucial role played by texts in the creation of knowledge” because “literary forms can direct the cognitive content of science through constraining problem-choice or through requiring … particular kinds of theoretical and experimental formulation.”⁵¹ But although being very excited about these results of research Levine also calms down happy

⁴³Chapple, 1986, p. 161

⁴⁴Levine, 1988, p. vii

⁴⁵Levine, 1988, p. viii

⁴⁶Levine, 1988, p. 4

⁴⁷Levine, 1988, p. viii

⁴⁸Beer, 1983, p. 4

⁴⁹Gilmour, 1993, p. 115

⁵⁰Levine, 1988, p. 2

⁵¹Peter Dear, ‘Introduction’, *The Literary Structure of Scientific Argument: Historical Studies*, (University of Pennsylvania Press: Philadelphia, 1991), p. 2-5

literary critics who see – finally – the hour of their importance advancing because either science will become part of the humanities or the study of literature part of science. “However much we might want to accept the contemporary reading of nonfictions as disguised fictions”, he warns us, “novels are not science”.⁵² But both incorporate the dominant notions of the real in a culture and in the nineteenth-century this notion was especially determined by scientific discourse. It was, however, also the time in which the use of the imagination became a recognised element of the scientist’s work.

But what can this approach do for the actual understanding of a literary text? Does it help our reading of it to know what kind of narrative structure has been used and why? Do we have to know the cultural context of a work in order to understand it properly? I want to discuss these questions by looking at the literary criticism of George Eliot’s *Middlemarch* and its relation to science. First of all it has to be said that what is true for scientific research is of course also true for literature. Literary texts do not arrive out of nowhere and authors just as much as scientists are part of a common culture. George Eliot is a good example for this since she was, like Darwin, an interested member of the whole cultural discourse. During parts of her life she participated in the editing of the *Westminster Review* and the essays she wrote herself show an active interest in literary criticism, biblical criticism, philosophy, the history of ideas, painting and also science.⁵³ The latter interest was further developed in the relationship to her partner, George Lewes, a practitioner and philosopher of science and by their common friends, some of whom were important scientists of their time. George Eliot is therefore an example of an author who possesses first hand knowledge of science and *Middlemarch* an example of a novel in which this knowledge is used.

Not only is one of the main characters of the book a physician with scientific ambition and another a natural historian, the whole novel is deeply occupied with epistemological questions which were asked in the discourse of science at the time. According to Levine the discussion of and answer to these questions in science helped to bring about a change in George Eliot’s treatment of realism in a movement away from “a confident empiricism” to a recognition of the ‘ideal’ as an essential element of reality perception.⁵⁴ Her behaviour as a narrator can equally be regarded as influenced by scientific concepts. Michael Mason notices that in *Middlemarch*, more than in any former novel, the narrator intervenes in person and claims that “it is plausible to associate this with an enlarged view of the witness participation in empirical observation.”⁵⁵ Another general element of Eliot’s narration has been identified as related to science and that is her concept of

⁵²Levine, 1988, p. 12-13

⁵³see for example George Eliot, *Selected Essays, Poems And Other Writings*, edited by A. S. Byatt and Nicholas Warren,(Penguin Classics: London, 1990)

⁵⁴George Levine, ‘George Eliot’s Hypothesis of Reality’, *Nineteenth-Century Fiction*, Vol. 35 (1980), 1-28, (p. 3)

⁵⁵Michael Mason, ‘*Middlemarch* and Science: Problems of Life and Mind’, in *Review of English Studies*, Vol. 22 (1971), 151-169, (p. 157)

character which in turn determines her way of character depiction in the novel.⁵⁶ So far we are still in the realm of cultural background knowledge which has informed the form and content of the literary work but could also be derived from the text itself by a close examination of its constituting elements. It helps to describe and identify the use of these elements when we have the background knowledge but in my opinion it should not radically change our interpretation of the work when the same concepts that are embedded in the cultural context are actually realised in the text.

What is crucial for a detailed understanding of the text, however, is the use of scientific allusions since they are used as a “flexible tool of great descriptive penetration and it is her [Eliot’s] habit to let a few words carry a large freight of meaning.”⁵⁷ “It is her art”, Brody goes on to say, “to make scientific concepts illuminate whatever she wished to project on the narrative”⁵⁸ and the problem with this is that it is impossible be illuminated when we do not understand the allusion which is meant to enlighten us. Brody identifies several of Eliot’s metaphors as coloured by Clifford’s geometry and Tyndall’s physics of colour thereby demonstrating that we lack any clue which would enable us to understand the metaphor when we have no idea about their scientific content. Since, as Robert Greenberg shows, scientific allusions and also the knowledge of scientific knowledge characterises persons in the novel, narrative evidence is missing when we are unable to understand the science. The whole text is full of “inner echoes and intricate analogical structure”, Greenberg stresses, which develops a “detailed elaboration of her conception” and according to George Eliot “none of these . . . was to remain irrelevant to her design.”⁵⁹ This leads to a number of studies whose aim it is to reveal “previously neglected contexts” whose “background will help to explicate an obscure” part of the text⁶⁰ but Greenberg cautions us concerning the revolutionary nature of such discoveries. “The significance of certain of the allusions . . . is inferable more or less from the context in which they appear”⁶¹, that is, we don’t have to understand that one of the main characters is discussing an old book on agriculture like a novelty in order to know that he is conservative. However, if we do want to appreciate the complexity of this work of art we have to research the allusion. And there might always be a text using science as a means of description and illumination which has not already been as thoroughly researched as *Middlemarch* and whose scientific concepts are still in need of being freed from obscurity.

Finally and briefly I want to discuss one great danger of this particular inter-

⁵⁶Levine, 1980, p. 27

⁵⁷Selma Brody, ‘Physics in *Middlemarch*: Gas Molecules and Ethereal Atoms’, *Modern Philology*, Vol. 85 (1987), 42-53, (p. 42)

⁵⁸Brody, 1987, p. 53

⁵⁹Robert Greenberg, ‘Plexus and Ganglia: Scientific Allusion in *Middlemarch*’, *Nineteenth-Century Fiction*, Vol. 30 (1976), 33-52, (p. 34)

⁶⁰Brody, 1987, p. 46

⁶¹Greenberg, 1976

disciplinary approach and this is the fact that most literary critics are not trained scientists and might therefore lack an informed and balanced understanding of science. This, of course, would have deep implications for all their work on the relationship between science and literature, whether it focuses on the culture of a certain period, the mechanisms which are at work in this culture or on the understanding of a particular author and his literary works. The claim that people who are trained in the humanities and later extend their knowledge and authority to the realm of science are sometimes unable to respect the methods, definitions and interpretations of another discipline has recently been made by the physicist Alan Sokal. Sokal criticises the “repeated abuse of concepts and terminology coming from mathematics and physics” by postmodernist thinkers⁶² and his criticism is relevant for everybody who works with an interdisciplinary approach. In general, Sokal disapproves of every person who uses concepts, theories or terminology of the sciences in a theoretical framework without knowing what he or she is talking about. Moreover, he expects this knowledge to go beyond the state of a hazy understanding and to be, above all, concerned with the comprehension of a concept, theory or technical term in the other discipline. It would of course make little sense not to work with an author’s or culture’s notion of science when dealing with them. The awareness, however, that their notion might differ from the one expressed by scientists is only fair in an approach that calls itself, after all, interdisciplinary.

I hope to have illustrated the following points in the course of my discussion of research which focuses on the relationship between science and literature in the nineteenth century. First of all, like every approach, this one does not make the same sense in every period or in connection to every author. The nineteenth century seems to offer a particularly fruitful area of research because in this period the relationship between science and literature was particularly close. One reason for this is that the fictional imagination worked in rather scientific ways while scientists discovered that the use of the imagination as an important factor in the development of scientific knowledge. In addition to that the society’s cultural background was still a unified one, its fragmentation only beginning in the second half of the century. In this situation the examination of the relationship between literature and science seems to have focused on three aspects. One is the understanding of literary texts in the light of scientific material which is either used by them or which surrounds them in their culture, the second is the understanding of science by extending the traditional examination of texts to scientific texts and analysing their literary elements, the third is an attempt to gain an understanding of culture at large, of the way material shifts inside of it, especially of the movement of literary and scientific material between the two discourses. The first and second aspect acknowledge the fact that no text is written in a vacuum and complement text-oriented approaches which concentrate on the in-

⁶²Alan Sokal and Jean Bricmont, *Intellectual Impostures: Postmodern philosophers’ abuse of science*, (Profile Books: London, 1998), p. 4

ternal structure of the literary work. They are useful to illuminate literary texts which make heavy use of scientific material and can, in general, try to account for certain narrative and argumentative structures. Scientists, however, might object to this kind of examination of scientific texts because it seems to turn sciences into humanities while literary critics are brought into the position to show that certain factors of science are actually exactly this. What the literary critic working with this interdisciplinary approach cannot do is to work with scientific tools in the realm of science. Its interdisciplinarity is therefore limited. The last aspect this approach focuses on, the attempt to understand culture at large, is the one which challenges the traditional understanding of the study of literature. Texts become contexts, they are cut into pieces which can then be taken out of their work-context, the appreciation of the literary work of art seems to get lost. It turns into just another piece of information. In spite of all that, literature is not devaluated but receives an important position in the formation of culture. Levine, when reflecting on his search for the Darwinian gestalt, mentions as one danger of this perspective the ‘anything goes’: “it might well be possible to find Darwin anywhere … I am free to draw on fluctuating notions of ‘Darwinian’ whenever I want to argue for his presence – metaphorically, at least – in a text. To an extent this will be unavoidable”. On the other hand, it is not not unavoidable. “The fact is”, he writes, “that I went hunting in *Little Dorrit* for Darwin and kept finding William Thomson, Lord Kelvin, instead.”⁶³ The practice of the literary critic is not so different from the practice of the scientist, after all. One tests his concepts on nature, while the other does so on texts. The interdisciplinarity of the discussed approach is also decreasing since the establishment of a new distinct academic discipline has been proposed: “science and literature”. The first Societies devoted to it are already existing.⁶⁴

⁶³Levine, 1988, p. 13

⁶⁴Dear, 1991, p. 2

BIBLIOGRAPHY

- Beer, Gillian. *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot and Nineteenth-Century Fiction*. Routledge & Kegan Paul. London, 1983.
- Brody, Selma B. 'Physics in *Middlemarch*: Gas Molecules and Ethereal Atoms', *Modern Philology*, 85 (1987) 42-53.
- Chapple, John A.V. *Science and Literature in the Nineteenth Century*. Macmillan. London, 1986.
- Dear, Peter (ed.). *The Literary Structure of Scientific Argument: Historical Studies*. University of Pennsylvania Press. Philadelphia, 1991.
- Eliot, George. *Selected Essays, Poems and other Writings*, edited by A.S. Byatt and Nicholas Warren. Penguin Classics. London, 1990.
- Gilmour, Robin. *The Victorian Period: The Intellectual and Cultural Context of English Literature 1830-1890*. Longman. London and New York, 1993.
- Greenberg, Robert A. 'Plexus and Ganglia: Scientific Allusion in *Middlemarch*', *Nineteenth-Century Fiction*, 30 (1976) 33-52.
- Klarer, Mario. *Einführung in die Anglistisch-Amerikanistische Literaturwissenschaft*, second, revised and extended edition. Wissenschaftliche Buchgesellschaft. Darmstadt, 1995.
- Kuhn, Thomas S. *The Structure of Scientific Revolutions*, second enlarged edition. University of Chicago Press. Chicago and London, 1970.
- Levine, George. *Darwin and the Novelists: Patterns of Science in Victorian Fiction*. Harvard University Press. Cambridge, MA, and London, 1988.
- . 'George Eliot's Hypothesis of Reality', *Nineteenth-Century Fiction*, 35 (1980) 1-28.
- Mason, Michael York. 'Middlemarch and Science: Problems of Life and Mind', *Review of English Studies*, 22 (1971) 151-69.
- O'Hear, Anthony. *An Introduction to the Philosophy of Science*. Oxford University Press. Oxford, 1989.
- Sokal, Alan, and Jean Bricmont. *Intellectual Impostures: Postmodern philosophers' abuse of science*. Profile Books Ltd. London, 1988.