

Connections between Jakob Winterl's scientific works and Schelling's philosophy of nature

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Abstract

Jakob Joseph Winterl is a significant figure both of the Hungarian history of science and the international history of chemistry. The present paper describes the connection between Winterl's dualistic chemistry and romantic Philosophy of Nature. Winterl's dualistic approach had an initiative role in the development of Schelling's early philosophy which can be documented by the text of the Weltseele. The goal of this paper is to verify the mutuality of the above connection.

Keywords

Jakob Joseph Winterl · dualistic Chemistry · romantic sciences · Schelling's Philosophy of Nature

1 Introduction

Jakob Joseph Winterl (1739-1809), born in Austria, professor of the University of Pest, created one of the most controversial chemical systems of the early 19th century. Winterl played a more important role in the scientific life of his age than he would really have deserved by his discoveries in chemistry. Thus, we would rather have to explain the intensity of his impact rather than the fact that he later fell into oblivion.

Winterl's activities were first examined in Hungary by Zoltán Szőkefalvy-Nagy (1960) [10] and Ferenc Szabadvány (1972) [15]. Winterl's figure became widely-known in the international history of science by the studies of researchers dealing with German romantic philosophy of nature. There are two articles standing as milestones in the examination of Winterl's impact. Snelders's study (ISIS 1970) [12] about the Hungarian chemist's influence on the German romanticism and Anja Skaar Jacobsen's article (Centaurus 2001) about Winterl's influence on Oersted. This latter article emphasizes the connections with natural philosophers and besides corrects some of the earlier published data on this topic.

In this paper I will examine Winterl's activities from the perspective of history of philosophy and introduce new points of view. Comparing some places of Winterl's and Schelling's texts I try to prove that there subsists not merely a similarity of principles, but these texts were actually taken from each other's works by Schelling resp. Winterl.

2 The importance of Winterl's works for the history of science

2.1 Winterl's role in the history of Hungarian natural sciences

Jacob Winterl is an outstanding figure of both the history of botany and chemistry in Hungary. His establishing a botanic garden was a very important event not only for the University of Pest but also for the development of botany in Hungary. He published the entire list of plants of the Botanic Garden in 1788 (*Index horti botanici universitatis Hungaricae qua pestini*). He later on, in 1784 tried to establish a periodical. There is only one extant copy of the *Monatliche Früchte einer Gelehrten Ges-*

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sellschaft in Hungarn (sic!). In this issue an there appeared an article of Winterl's, which is one of the earliest treaties on electrochemistry [15].

His chemical activities were fruitful mainly in what we would call analytical chemistry. Accounts of Winterl's water analysing procedures were first published by his disciple's, Joseph Österreicher's Ph.D. thesis based on Winterl's original manuscripts. Creating the procedure of oxygen absorption for water composition analysis proved to be scientifically relevant. Winterl's publications also had a direct impact on the improvement of analytical chemistry. In 1790, he published an article about his observation on Rhodanide, which turns red in the presence of iron. Unfortunately, he could not give an explanation for his observation [15, 16].

Winterl became well-known among chemists and representatives of natural philosophy thanks to his books and articles published in the most important chemical journals. His publications evoked wide-ranging response. His works were known to Davy and his dualistic views probably had an influence on Berzelius' view as well [14].

The most important message of his main work, *Prolusiones*, is that the elementary components of chemicals are the 'acid' and 'base' ingredients. In Winterl's opinion the 'acid-principle' can be identified with positive electricity and the 'base-principle' with negative electricity. "Andronia", which became the most ill-famed and best-known name of a hypothetical chemical principle, was supposed by Winterl to be a common constitutive component of all chemical materials.

2.2 The impact of the "Prolusiones" on contemporary science

With the title *Prolusiones ad chemiam saeculi decimi noni* (Prelude for the Chemistry of the Nineteenth Century) Winterl wanted to emphasize the necessity of building a chemical system. Numerous examples show that his efforts evoked excessive praise and criticism as well. Joseph von Görres, professor of physics and philosophy at Heidelberg University, called Winterl the "Kant of Chemistry". Karl Wilhelm Gottlob Kastner, professor of Jena University, wrote about Winterl that "he is the only man who tried to create a system for chemistry". Sigismund Hermbstädt rated the hypotheses of the Hungarian professor as "Schellingian toys", while Davy criticized them as obscure metaphysical [4, 12].

Johann Wilhelm Ritter, one of the founders of electrochemistry, was the one who drew Oersted's attention to Winterl's book, and so he was among the very first followers of *Prolusiones* [12]. The Danish scientist translated this book into German. In the foreword he wrote about the Hungarian chemist that: "Winterl bei seinen Versuchen nicht bloss den Bezug eines Einzelnen zu enem andern Einzelnen, sondern den Bezug des Einzelnen auf das Ganze wissen wollte" [9]. Later Winterl dedicated his *Darstellung der vier Bestandtheile der anorganischen Natur* to Oersted, and the foreword was written by Ritter.

Winterl's German reception was most effective in Jena, where Kastner gave lectures on the works of the Hungarian chemist and tried to verify Winterl's hypotheses with experiments, too [12]. Winterl himself sent *Prolusiones* to several European scientific societies and offered it for discussion to the scientific board in Göttingen, too. The term 'Andronia' was often discussed in the important journals of chemistry. In Table 1 I give a concise outlook on the contemporary scholarly response elicited by Winterl's works.

As a result of Guyton de Morveau's criticism the Danish Academy called up scientists to discuss the hypothesis of the Andronia-principle. Negative comments on the topic caused uncertainty among previous followers. For instance, Oersted's interest decreased in Winterl's theory by 1807. In 1809 the best French chemists of the age, Fourcroy, Guyton de Morveau, Berthollet and Vauquelin proved that "pure Andronia" prepared by Winterl, was merely Ailicic Acid polluted by different materials [14].

Despite this failure, not all his contemporaries doubted Winterl's earlier results. Ritter thought that the dispute did not touch important other questions. It seems that Winterl's system focused the attention instead of Andronia on the relationship between matter and power [16]. Winterl's importance in history of science is that he wanted to establish a system, which took electric phenomena into consideration too. This system, in spite of its exaggerations, influenced not only the history of science, but contemporary philosophy as well.

3 Philosophical reception of Winterl's dualistic chemistry

3.1 References to Winterl in the works of Hegel and Schelling

Hegel mentioned Winterl in his work *Naturphilosophie* (1817), where he referred to Winterl with the following words: "He was a professor in Pest at the beginning of the century and had the ambition to deeply examine chemistry. He assted that he had found a special material called Andronia, however this discovery was not proven".¹

Hegel referred to Winterl as the author of disproved hypotheses. Winterl's dualistic approach had, however, a robust impact on the formation of Schelling's romantic natural philosophy. This impact - even the mutuality of the reception - can be verified passages taken from their texts.

In the preface of *Weltseele* published in 1806, Schelling thought it was important to bring out a second edition of *Prolusiones*, because Winterl had meanwhile proved his ideas valid: "Bei der neuen Ueberarbeitung dieser Schrift ist mancher vergessene Keim wieder sichtlich geworden, der seitdem entfaltet wurde. Durch diese Bemerkung schien eine wiederholte Aufgabe dieser Schrift noch mehr gerechtfertigt zu werden, sowie

¹ Hegel, 1979, II. 294. and 321. Hegel does not quote about silicid acid directly from Winterl, but from the German translation of *System der dualistischen Chemie des Prof. J. J. Winterl* (1806)

Tab. 1.

Author	Title	Periodical	
1803	Guyton de Morveau, L. B.	Guyton's Beurtheilung vom Winter's Chemie des 19ten Jahrhunderts	Annalen der Physik
1803	Wolff, F.	J. J. Winterl's Prolusiones ad chemiam saeculi decimi noni	Annalen der chemischen Literatur
1804	Gehlen, A. F.	Winterl's System betreffend	Neues allgemeines Journal der Chemie
1804	Chenevix, R.	Bemerkungen über ein Werk, welches den Titel führt: Materialien zu einer Chemie des neuzehnten Jahrhundert, herausgegeben vom Oersted	Annalen der Physik
1804	Wuttig, J. F. C.	Winterl's Ansichten der Chemie und Physik	Magazin für den neuesten Zustand der Naturkunde
1804	Kastner, K.W.G.	Beiträge zur Kenntniss der Winterl'schen Ansicht der Chemie	Journal der Pharmazie
1806	Viborg, E.	Bericht über die von dem Herrn H. J. Jaqcobsen mit der Andronie angestellten Versuche	Neues allgemeines Journal der Chemie
1807	Bucholz, C. F.	Prüfung der Winterl'schen Systems; enthaltend eine Untersuchung des neuesten Verfahrens Winterl's die Andronie zu gewinnen	Journal für die Chemie und Physik
1808	Göttling, J. F. A.	Ueber Winterl's entgeistete schwefelige Säure	Journal für Chemie und Physik
1810	Fourcroy, A. F. Guyton de Morveau, L. B. Berthollet, C. L. Vauquelin, L. N.	Bericht über eine angebliche Entdeckung des Hrn. Winterl, Prof. der Chemie zu Pesth	Journal für Chemie und Physik
1810	Pfaff, C. H.	Ueber Winterl's entgeistigte Basen und Säuren	Journal für Chemie und Physik

der Verfasser wohl sagen darf, daß sie führt ihn selbst durch die Erwähnung Winterl's, des aufrichtigen und tiefschauenden Forschers, und die Meinung von ihrer Uebereinstimmung mit seinen, auf ganz andern Wegen gefundenen Resultaten, welche er äußert, einen neuen Werth erlangt haben."²

This annotation is outstanding, because Schelling seldom indicated his sources. Jacobsen's article contains a reference to this part of the text and the author notices that Winterl was at that time not acquainted with any of the writings of the German philosopher. She based this statement on a letter written by Winterl to Oersted in 1803, in which the Hungarian professor asked information about the works of Schelling. In 1804, however, Winterl already wrote in his book *Darstellung der vier Bestandtheile der anorganischen Natur* that he received Schelling's *Weltseele* only when he almost finished the manuscript of his book.³

In the text of the above quoted *Weltseele*, Schelling referred with exactly the same words to Winterl's idea as he himself did. Even Schelling's terminology is similar to Winterl's when making the the reference: "auf ganz andern Wegen gefundenen Resultaten" (Schelling), "entgegengesetzten Wegen entstandene Harmonie" (Winterl).⁴ This similarity in the texts shows that he saw the confirmation of Schelling's philosophy of nature not only in the dualistic view of *Prolusiones* but also in the conception of *Darstellung der vier Bestandtheile der anorganischen Natur*.

3.2 The role of Winterl's reception in the formation of Schelling's philosophy of nature

In the following passage we reconstruct Winterl's impact on Schelling. The two aspects of this impact are the foundation of chemistry as scientific discipline and the establishment of the relationship between electric and chemical phenomena.

Kant wrote in his *Metaphysische Anfangsgründen der Naturwissenschaften*: "Wenn aber diese Gründen oder Prinzipien in ihr, wie z.B. in der Chemie, doch zuletzt bloss empirisch sind (...) verdient das Ganze in strengem Sinne nicht den Namen einer Wissenschaft, und Chemie sollte daher eher systematische Kunst als Wissenschaft heißen" [15]. In contradiction to Kant's condemnation, Jeremias Benjamin Richter set the aim that chemistry had to be established not only as a practice but as a science [2]. This sort of change in the viewpoint had been prepared by Winterl, too.

In his work *Von der Weltseele*, Schelling defined 'mechanism' approached from starting with the 'organism'. Winterl's influ-

² *Von der Weltseele*, SW, II. 352

³ „Ich fand dieses Buch erst, als alles Vorige schon niedergeschrieben war, nahm es (durch Kant's Anfangsgründe der Naturwissenschaften gestimmt) ohne alles Zutrauen in die Hände, fand aber bald die genannte Übereinstimmung seiner apriorischen Ideen mit meinen aposteriorischen, dass ich über die auf so entgegengesetzten Wegen entstandene Harmonie erstaunte." Winterl, 1804, 435.

⁴ Winterl, 1804, 435. The "der entgegengesetzte Weg" in Winterl's text means his own *a posteriori* and Schelling's *a priori* approach.

ence also confirmed this point of view. He took chemistry – contrary to Kant – as a science equal in importance to physics. Another aspect of Winterl's influence on Schelling is the connection between electric and chemical phenomena, which appears implicitly in the works of Kant. A very important statement of *Von der Weltseele*: "Neue und bis jetzt unbekannte Versuche werden die Sache zur Entscheidung bringen, wenn erst irgend ein Chemiker entschlossen ist, der Lavoisier der Elektrizität zu werden".⁵ Winterl's chemical activity met Schelling's requirements at least in its tendency.

The following years brought more important insights in Schelling's natural philosophy.⁶ In 1797, Schelling thought physics to be applied mechanics and associated the basic forms of motion with Statics, Chemistry and Mechanics. In his works *Allgemeine Deduktion der dynamischen Prozesses* and *System des transzendentalen Idealismus* written in 1800s, magnetism was taken to be the first level of dynamic processes, the second level was electricity and the third was that of the chemical processes [11]. Winterl's hypotheses were helpful in promoting this shift of focus to Schelling.

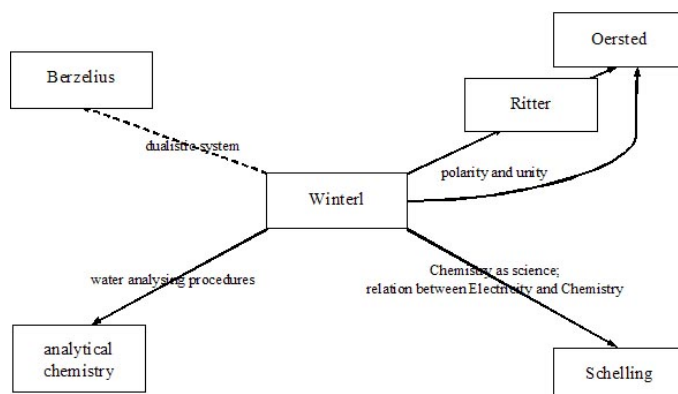


Fig. 1.

4 Summary

It is difficult to dissociate the chemical and natural philosophical components in the impact of Winterl's works. Winterl had a direct influence on the German philosophy in general as well.⁷

Romantic sciences was the medium of Winterl's reception. The holistic or dynamic views belonged to the spiritual heritage of romantic sciences of Göttingen. As a consequence of the above mentioned recent change in Winterl's assessment, his ideas are associated with that of the "Missing Paradigm" [1].

Jardine(1991) quotes Collingwood, who thought that the neogothic style of the Albert Memorial in London was meaningless for the posterity. And Jardine calls the main work of Lorenz Oken the 'Albert Memorial of the history of science'[7]. The interpretation of Winterl's *Prolusiones*, the Albert Memorial of the Hungarian history of science, is possible only in terms of

⁵ *Von der Weltseele*, SW II. 450-51.

⁶ *Ideen zu einer Philosophie der Natur*, SW II. 27.

⁷ Similarly to another Hungarian natural scientist called Johann Andreas Segner, who influenced Kant's philosophy. Gurka, 2004, 28-30.

and within the context of romantic sciences. At the same time it must be taken into account that Winterl himself contributed to the very formation of romantic sciences themselves.

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