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Historical paper

Arnoldus Van Rhijn on aphasia: A forgotten thesis

Paul Eling*

Radboud University Nijmegen, Donders Institute for Brain, Cognition and Behavior, HE Nijmegen, The Netherlands

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ABSTRACT

Background: Aphasia formed a central topic in the discussion on localization of function in the nineteenth century, in particular in France, Germany and Great Britain. Little is known on contributions from the Netherlands.

Aim: This paper aims to discuss the contents of Arnoldus Van Rhijn's dissertation on aphasia, written in 1868 and one of the very few Dutch contributions to aphasiology in the nineteenth century. Added to this paper is a translation of the "Physiological Part" of Van Rhijn's dissertation.

Outcome: Van Rhijn discussed three cases with acquired aphasia. He rejected Broca's notion of a cortical center for the articulation of speech and instead regarded the cortex as the site where the will exerted its influence. He argued that there is a certain form of specialization: the will to say something is localized at a different place than the will to write. According to Van Rhijn, the highest motor centers are localized in the subcortical gray areas. Van Rhijn concluded that aphasia may result from lesions to the cortical centers involved in speaking, or from a disconnection of the cortical and subcortical centers.

Conclusion: Very little work was done on aphasia in the 19th century in the Netherlands. Van Rhijn's thesis, from an aphasiological point of view of limited value, does show that the notions of "centers", "connections", and "disorders due to disconnections" were generally known before Wernicke, also in the Netherlands.

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1. Introduction

Aphasia formed a central topic in the discussion on localization of function in the nineteenth century, in particular in France, Germany and Great Britain (Eling and Whitaker, 2009). This discussion focused primarily on the involvement of different parts of the brain in language processing. More specifically, language was considered to consist of a number of different components, for instance for processing language input and output in various modalities. Despite numerous reviews of this important era, very little is known about contributions from the Netherlands.

For a detailed analysis of views on localization in the Netherlands, I refer the reader to Eling (2008). The Netherlands

had a good reputation in the medical world in the 17th and 18th century and physicians like Nicolaas Tulp (1593–1674), Herman Boerhaave (1668–1738) and Petrus Camper (1722–1789) played a prominent role. The situation was dramatically different in the 19th century, in particular with respect to the study of the nervous system. Jacobus Schroeder van der Kolk (1797–1862) wrote an important treatise 'on the minute structure and functions of the spinal cord and medulla oblongata and on the proximate cause and rational treatment of epilepsy' in 1857 and may be regarded as a founding father for both neurology and psychiatry in the Netherlands (Eling, 1998). However, very little empirical research on the nervous system was performed by other Dutch scientist in the 19th century. Cornelis Winkler (1855–1941) became the first

* Radboud University Nijmegen, Donders Institute for Brain, Cognition and Behavior, P.O. 9104, 6500 HE Nijmegen, The Netherlands.

E-mail address: p.eling@donders.ru.nl.

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Professor of Psychiatry and Neurology in 1893 and the first chair in Neurology was founded only in 1923 in Amsterdam [for a more detailed overview, the reader is referred to Bruyn and Koehler (2002) and Eling and Koehler (2002)]. Given this slow development of the study of the brain in the Netherlands, it does not come as a surprise that Dutch scientists did not participate in the discussions on aphasia and localization of function in the brain.

In order to shed some light on how physicians in the Netherlands looked at aphasia and the issue of localization, I examined the bibliography of Mesdag (1923), which gives an excellent overview of Dutch neurological and psychiatric publications in the 19th and beginning of the 20th century. In this bibliography, one finds 69 papers categorized under the label apraxia and speech disorders, 10 of which were published before 1900.¹ The majority of papers concerned case descriptions. Here, I will analyze the dissertation of Arnoldus Van Rhijn (1868), titled *Aphasia*, in detail, both looking at the methods of investigation, that is the case descriptions, and theoretical analysis, presented in the final part of the book. Unlike most case descriptions, this work presents a more elaborate discussion of various views on aphasia and thus gives us an opportunity to study how at least some physicians in the Netherlands looked at aphasia. Apparently nobody was impressed by this booklet and it was quickly forgotten.²

The thesis was written at a crucial period in the history of aphasiology. In Paris, heated discussions had taken place in the early 1860's, primarily focusing on the question whether the symptoms of language disorders following brain lesions supported Franz Joseph Gall's (1758–1828) notion of localization of function. In England, the topic was also discussed and in 1868, the two 'leading figures', Paul Broca (1824–1880) and John Hughlings-Jackson (1835–1911) presented their ideas on a conference in Norwich (Lorch, 2008). In Germany, the reaction to this language localization debate resulted in the influential contribution of Carl Wernicke (1848–1905), arguing that at least two language centers can be localized, one for auditory word recognition in the temporal lobe and one for word production in the frontal lobe, both connected by a fiber pathway, the arcuate fasciculus. This latter development, transformed by Ludwig Lichtheim (1845–1928) in 1885 in the classical view on aphasiological syndromes (Eling, *in press*), laid the foundation for a more general approach of functional analysis of the working of the brain in terms of centers and connections. Six years before Wernicke, Van Rhijn hypothesized that aphasia may occur not only after lesions to language-related centers, but also as a consequence of a disconnection of centers. The thesis also contains an early description of the phenomenon of "conduite d'approche" or "phonematic approximation". The present paper deals with the historical background and the contents of the thesis. In particular, Norman Geschwind's (1926–1984) claim is

discussed that Wernicke gave us a new methodology for the analysis of brain functions. The last part provides a translation of the final chapter of the thesis, in which Van Rhijn described his view of language and the brain.



1.1. Biography

Arnoldus Van Rhijn was born on 8 March 1844 in "Katwijk aan Zee", a small village at the west coast of the Netherlands, near the Hague. He was a son of Dr. Hendrik Bernardus Van Rhijn, general practitioner in Katwijk and Sophia Gijsberta de Graaf. On 20 September 1861, he began his medical studies at the University of Leiden.³ After he graduated in 1867, he worked as

¹ An early Dutch description of aphasia can be found in Van Swieten's commentaries of Boerhaave's Aphorisms (Van Swieten, 1742–1772).

² Willem Jong (1878) defended his dissertation 'On Aphasia' in 1878 at the University of Leiden. Although he refers to much the same literature as Van Rhijn, he does not mention the dissertation of Van Rhijn.

³ Medicine was a popular profession in the Van Rhijn family. Arnoldus' grandfather Arnoldus Van Rhijn (1786–1868), was a physician, as well as his father Henrik Bernardus (1816–1901) was a physician, and two brothers of his father, Huibert Willem (1813–1895) and Willem Pieter Van Rhijn (1819–1900). His father wrote a thesis on 'Brevis Conspectus Morborum' in 1860, while his uncle Huibert Willem wrote a thesis on 'Fungo Medullari in Genere' in 1838. His other uncle Willem Pieter wrote a thesis on Sialolithiasis in 1865. Arnoldus' younger brother Hermanus Johannes (1852–1926) also studied medicine and wrote a thesis on scoliosis ('Over ruggegraatsverkrummingen', 1880). Adriaan Johan Van Rhijn (1847–1927), a nephew of Arnoldus, wrote a thesis on conjunctivitis and trachoma ('Conjunctivitis and Trachoma', 1873) and his son Huibert Willem (1875–1956) became also a physician. Apart from this last Huibert Willem, they all studied at the University of Leiden.

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