Willem Vrolik on cyclopia

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Abstract. One of the founders of the Museum Vrolikianum, Professor Willem Vrolik (1801–1862), was very interested in teratology, especially in a congenital malformation termed cyclopia. In 1834 he published a paper on cyclopia. This work was mainly based on studies of cyclopic specimens present in the collection of his father, Professor Gerardus Vrolik. In this study he proposed a classification system for cyclopes, in which he divided them into five main types. This study also formed the basis for the chapters on cyclopia in his Handbook of pathological anatomy (1842–1844) and his Tabulae ad illustrandam embryogenesin hominis et mammalium (1844–1849). In these studies the specimens of cyclopes of man and mammals, still present in the collection of the Museum Vrolik in the Department of Anatomy and Embryology of the University of Amsterdam, were described and illustrated with beautiful lithographs. The collection consists of five human cyclopes and nineteen other cyclopic mammals. These mammals are pigs, lambs and a cat.

Introduction

A congenital malformation, which is characterized by the appearance of only one eye, is termed in the classical teratological literature cyclopia [1]. This deformity attracted much attention from earliest times [2]. It was already known in Assyrian–Babylonian childbirth omens [3]. In many countries stories existed about one-eyed men. It seems reasonable to assume that the observation of cyclopic children gave rise to the belief that there really were one-eyed persons [4]. In Greek mythology the cyclopic giant Polyphemus’ only eye was destroyed by Ulysses and his companions with a burning stake so that they could escape from the island of the cyclopes [5]. Many authors relate these mythological figures to human congenital malformations [6–8]. However, there are also authors who are convinced that fossils of animals were the examples for these mythological figures. The finding of the skeletal remains of a pygmy elephant from the glacial period in Sicily, in Messina, Palermo and Trapani, may have given rise to the idea of the fabulous cyclopic giant [9, 10]. In fact, the entrance to the nasal cavity in these fossil skulls had the appearance of one large orbit. In China and India also a medial frontal eye was known [9]. This eye could be related to
the frontal eye of fossil and existing amphibians and reptiles. This third eye is also rudimentarily present as the pineal organ in man. This explanation cannot be true for the mythological figures of Greece which had only one eye. Two explanations are possible: either the Greek writers were really familiar with the teratological human cyclopes, or the Greek authors with their stories about Polyphemus, and the Arabic poet who wrote Sinbad the Sailor, influenced the medieval writers. In the Middle Ages there was no doubt about the fact that cyclopes lived in the unknown parts of Asia and Africa. The place were the ‘Monoculi’ lived was described exactly in the *Cosmographia Universalis* of Sebastian Munster [3].

The oldest case of cyclopia is described in a letter in Italy in 1619: ‘Landi conte Ippolito, Lettera al figlio Ottaviano da Vienna li 8 settembre’ [11]. A wellknown case of cyclopia is the specimen described by Licetus. However, this author did not regard cyclopia as a congenital malformation [11]. In the 18th century the ideas about teratology became increasingly scientific and scientists started to collect specimens of the congenital malformations of man and animals [12]. It was, however, not until the end of the 19th century that histological studies were performed on these specimens. Based on his own observations and many studies by others, I. Geoffroy Saint-Hilaire [13] in 1832 classified anomalies in the face of man and animals into two ‘families’: cyclocephaly (kyklos = circle) and otocephaly (otos = ear). In the first case there is approximation or variable union of the orbits and their contents, with the ears remaining normally situated, while in the second malformation there is approximation or union of the external and middle ears at the midline, reduction or absence of the mandible and sometimes approximation or fusion of the orbits or ocular structures as well. In this period it was Willem Vrolik in the Netherlands who studied cyclopia and furnished the pathological collection of his father, Gerardus Vrolik, with specimens of human and animal cyclopes.

**The Museum Vrolikianum**

At the end of the 18th century Gerardus Vrolik (1775–1859) started to collect specimens for what was later called the Museum Vrolikianum [14–17]. He studied medicine at the University of Leiden and graduated as doctor of medicine on a dissertation: *De defoliatione vegetabilium et de viribus plantarum* [On the falling of leaves and on evergreen plants]. In 1796 he was appointed Professor of Botany at the Athenaeum Illustre, the predecessor of the University of Amsterdam. In 1798 he succeeded Professor Andreas Bonn as Professor of Anatomy and Physiology. Moreover he was given the chair and a clinic for obstetrics in the Binnen-Gasthuis in Amsterdam. In this position he was the first doctor with a clinic for obstetrics in the Netherlands [18]. His scientific interests were very diverse and he published many papers on many subjects, including teratology [19].