Johann Friedrich Meckel, the Younger (1781-1833) [1]

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Johann Friedrich Meckel [3] studied abnormal animal and human anatomy in nineteenth century Germany in an attempt to explain embryological development. During Meckel’s lifetime he catalogued embryonic malformations in multiple treatises. Meckel’s focus on malformations led him to develop concepts like primary and secondary malformations, atavism, and recapitulation—all of which influenced the fields of medicine and embryology [17] during the nineteenth and twentieth centuries.

Meckel was born 13 October 1781, in the university town of Halle, Germany. His father, Philipp Friedrich Theodor Meckel, and his grandfather, Johann Friedrich Meckel [36] the elder, were physicians and anatomists and Meckel grew up helping his father prepare new specimens for the anatomical museum in their house. Meckel attended a local elementary school until the age of fourteen, when he traveled to Magdeburg, Germany to study at the Cathedral Gymnasium, a university preparatory school.

From 1798 to 1801 Meckel attended the University of Halle [3], in Halle, Germany, where he studied medicine and anatomy. During those years at Halle, Meckel’s focus on malformations led him to develop concepts like primary and secondary malformations—the former refers to a developmental anomaly, while the latter refers to a condition that arises as a result of another malformation.

After graduating from Halle, Meckel traveled to Würzburg, Germany, and Vienna, Austria, to see the anatomical collections housed in each city. Meckel returned to Halle in 1803 to attend his father’s funeral and publish his first unfinshed work, On thediverticulum umbilicale. In 1804 Meckel left Halle again, this time to visit Paris, France where he met and worked with Étienne Geoffroy Saint-Hilaire, Alexander von Humboldt, and Georges Cuvier [16]. With Cuvier, Meckel helped to analyze the specimens found in the collection at Jardin des Plantes (Botanical Garden), all of which Cuvier described in his five volume Léçons d’anatomie comparative (Lessons in Comparative Anatomy), published from 1799–1805. While in Paris, Meckel also traversed the countryside looking for bird eggs to use in his study of embryology [17].

In 1806, Meckel returned to Halle to find Napoleon’s forces occupying his hometown. Napoleon had closed the university and set up his temporary headquarters in Meckel’s home. In May of 1808 the university reopened and Meckel received the position of professor of surgery, normal and pathological anatomy, and obstetrics. One year later, he married Friederike von Kleist, a woman who also studied anatomy and who began to administer his anatomical collection.

In 1809 Meckel published about a birth defect where the connection between the fetus’s intestine and the mother’s yolk sac does not close, resulting in internal bleeding of the newborn. Meckel gave an early description of the phenomena, later called Meckle’s diverticulum, which he related to embryonic development.

Throughout the rest of his life Meckel continued to teach, conduct research on pathology, and obtain specimens for his collection. He wrote on various anatomical and embryological topics. In 1810 Meckel finished the German translation of Cuvier’s Léçons d’anatomie comparée (Lessons in Comparative Anatomy) with the addition of his own findings. In the translation, Meckel drew a parallel between the order of animals, the stages of development, and the scala naturae (scale of nature), sometimes called the great chain of being. Scala naturae is the theory that nature contains a hierarchical scale not based on common descent, in which humans reside at the top of earthly creatures but beneath angels and God. Meckel also accepted the idea of recapitulation, wherein embryos of higher animals pass through stages of development in which they resemble lower animal forms; instead, embryos start out generally similar in form and then develop more specific characteristics as the embryos grow. Ernst Haeckel [16], professor of comparative anatomy at the University of Jena [14], in Jena, Germany, contributed to the debate in the 1870s, expanding the Meckel-Serres Law [13] with the inclusion of evolutionary principles, into what became known as recapitulation theory [33], or the biogenetic law [11].

In 1815 Meckel became the editor of the journal, Deutsches Archiv für die Physiologie (German Archive of Physiology), run by his mentor, Johann Reil. Under Meckel’s control, the journal emphasized empirical study and published pieces on comparative anatomy and embryology [7]. In 1826 the journal’s name was changed to Archiv für Anatomie und Physiologie (Archive of Anatomy and Physiology), and Meckel stayed on as its editor until his death from liver disease on 31 October 1833.

Sources

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