

**Pioneers in Microscopy: The Interconnected Contributions of Josef von Gerlach and  
John Goodsir to Histology**

**As Presented to the Royal College of Physicians of Edinburgh, the University of  
Edinburgh and the Anatomical Museum**

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**Introduction**

The history of histology is marked by the contributions of numerous scientists, but few have had as lasting an impact as Josef von Gerlach and John Goodsir. Both men were pioneers in their respective regions - Gerlach in Germany and Goodsir in Scotland - yet their work in the mid-19th century displayed a level of interconnectedness that significantly advanced the field of microscopic anatomy. This compilation explores the relationship between Gerlach's and Goodsir's work, particularly through the lens of Gerlach's seminal 1858 publication, "Mikroskopische Studien aus dem Gebiete der menschlichen Morphologie," and its influence on Goodsir's possible research methodologies and educational practices.

**Josef von Gerlach: A Life Dedicated to Microscopic Anatomy**

Josef von Gerlach (1820-1896) was born in Posen, Prussia (now Poznan, Poland).<sup>1</sup> He studied medicine at the University of Berlin and later served as a professor of anatomy at the University of Erlangen. Gerlach's career was distinguished by his innovations in histological techniques and his passion for anatomical micrography. In 1858, the same year he published his influential work, Gerlach introduced a novel histological stain made of carmine mixed with gelatin, which significantly enhanced the visibility of cellular structures in microscopic samples.<sup>2</sup>

Throughout his academic career, Gerlach was known for his dedication to teaching and his ability to inspire his students. His commitment to the university and his students was paralleled by his contributions to scientific literature, where he emphasised the importance of precise and reproducible methodologies in microscopic studies.

**"Mikroskopische Studien" A Foundational Text in Histology**

Gerlach's "Mikroskopische Studien aus dem Gebiete der menschlichen Morphologie" is considered a foundational text in microscopic anatomy. The book is meticulously organised

into sections that cover various human tissues, each detailed with precise descriptions and elaborate illustrations. Gerlach's methodological approach, particularly his innovative use of carmine gelatin as a stain, provided a new lens through which cellular structures could be viewed more clearly than ever before. The book's detailed illustrations served as a vital educational tool, allowing intricate cellular structures to be systematically catalogued and studied.

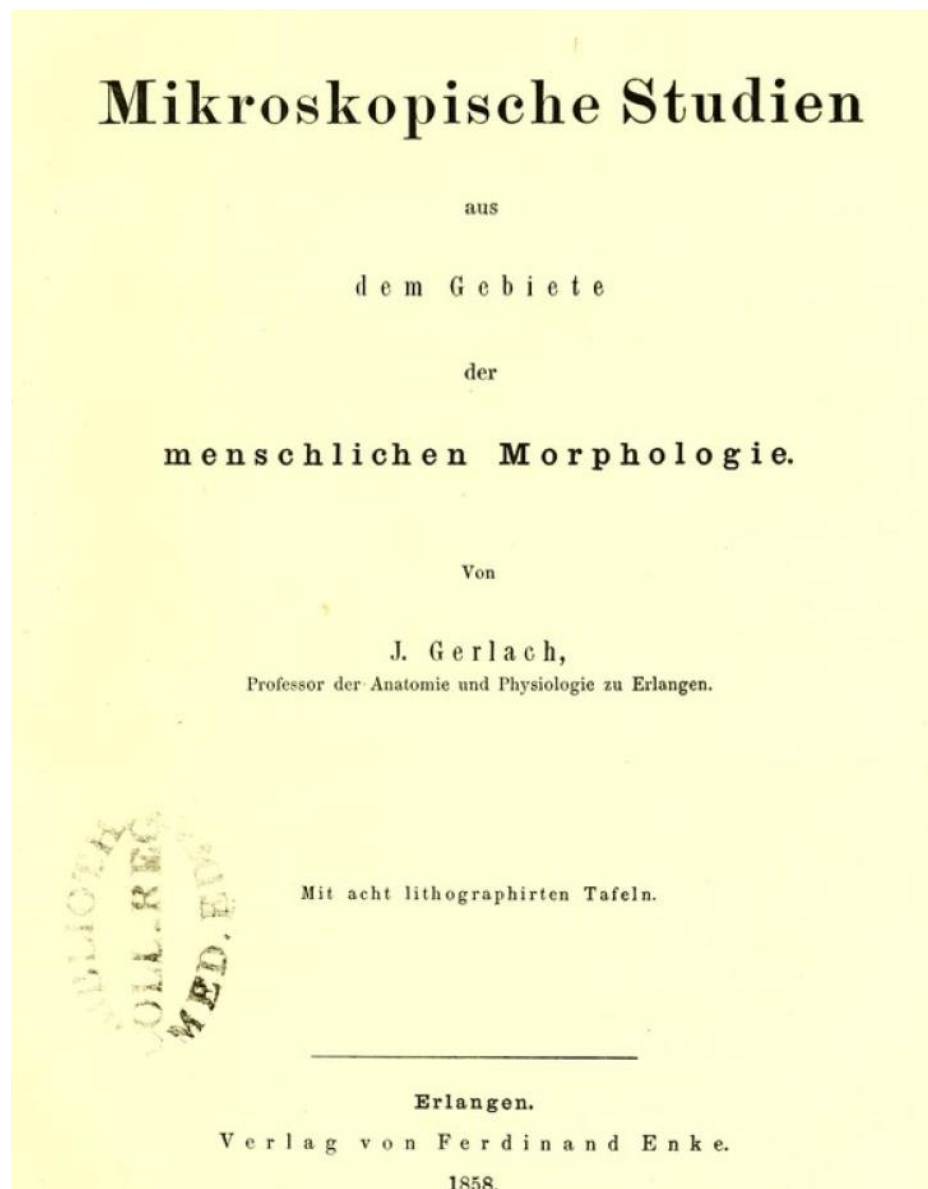


Figure 1. Title Page to von Gerlach's "Mikroskopische Studien aus dem Gebiete der menschlichen Morphologie"

## **Goodsir's Library and Gerlach's Influence**

John Goodsir, an esteemed anatomist at the University of Edinburgh, possessed an extensive collection of scientific literature, including Gerlach's "Mikroskopische Studien."<sup>3</sup> The presence of this work in Goodsir's library, which still resides in the collections of the Royal College of Physicians of Edinburgh,<sup>4</sup> underscores the importance of Gerlach's methodologies to Goodsir's own research. Goodsir's incorporation of Gerlach's staining techniques likely refined his microscopic studies, making his observations more precise and reproducible.

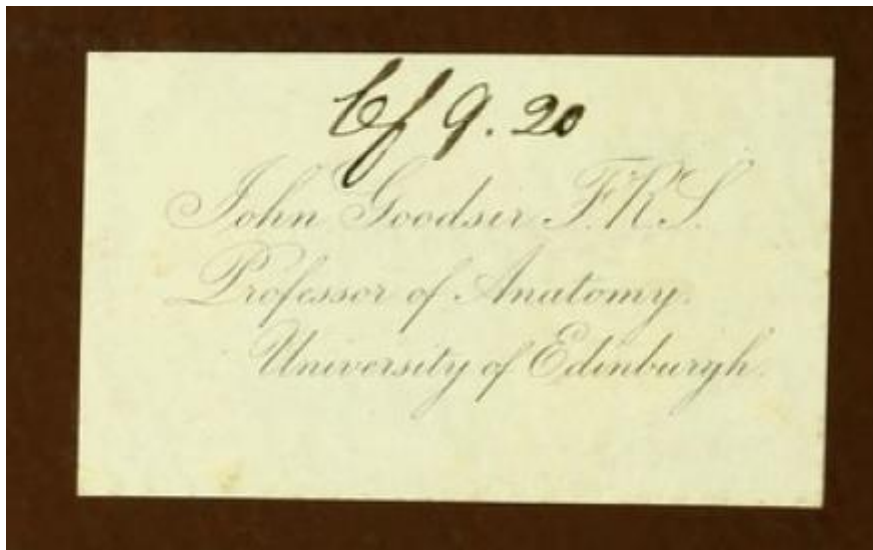


Figure 2. Bookplate of Professor John Goodsir affixed in his personal copy of von Gerlach's "Mikroskopische Studien aus dem Gebiete der menschlichen Morphologie"

## **Academic and Personal Connections**

The interplay between Gerlach and Goodsir extended beyond mere textual influence. Records indicate that Gerlach was aware of Goodsir's work, particularly in the realm of embryology - a mutual area of interest. Their academic interaction was further facilitated through mutual connections like Albert von Kolliker (1817-1905), a noted histologist who maintained correspondence with both scientists. This network of intellectual exchange was pivotal in shaping their research directions and methodologies.

## **Correspondence and Personal Records**

Despite the absence of direct mentions in Gerlach's private letters, such as those to Elias von Steinmeyer or Johan Heinrich Blasius, the indirect connections through mutual acquaintances and the inclusion of Goodsir's works in Gerlach's publications suggest a level of mutual

respect and acknowledgment. Additionally, Gerlach's advancement in photomicrography, as described in his 1863 handbook "Die Photographie als Hilfsmittel mikroskopischer Forschung," likely influenced Goodsir and other contemporaries, emphasising the practical applications of photography in microscopic studies. This publication not only detailed the use of photography for documenting microscopic findings but also advocated for its precision over traditional illustration methods. Gerlach emphasised the reproducibility of photographic records, which could serve as unequivocal evidence in scientific debates. His guidelines on the technical aspects of capturing microscopic images, such as lighting techniques, the choice of lenses, and the preparation of specimens, were instrumental in setting standards that influenced microscopic studies well into the future.

### **Conclusion**

The collaborative threads that interwove the scientific endeavours of Josef von Gerlach and John Goodsir have undeniably contributed to the robust foundation upon which modern histology rests. Through a blend of innovative practices and shared intellectual interests, these two figures transcended geographical and disciplinary boundaries to enhance the understanding of microscopic structures in the biological sciences. The meticulous work of Gerlach, particularly evident in his 1858 publication and his pioneering efforts in photomicrography, provided invaluable tools and techniques that were likely adapted by Goodsir to refine the precision and depth of his own microscopic examinations.

This narrative not only highlights the critical role of interdisciplinary influences in scientific progress but also underscores the importance of academic collaboration in fostering significant advancements. The mutual respect and intellectual rapport between Gerlach and Goodsir, facilitated by shared connections and complementary discoveries, exemplify how the exchange of knowledge and techniques across different scientific communities can lead to profound impacts on a global scale.

Moreover, the preservation of Gerlach's works in Goodsir's library and the continued reverence for these texts in prestigious institutions underscore their lasting relevance and influence. As we continue to delve deeper into the cellular and molecular realms, the pioneering work of Gerlach and Goodsir serves as a reminder of the enduring power of curiosity and collaboration in driving the frontiers of science forward. This compilation not only pays homage to their contributions but also inspires current and future generations to

build upon the legacy of these remarkable scientists, ensuring that the pursuit of knowledge remains as vibrant and dynamic as the microscopic worlds they revealed.

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<sup>1</sup>[https://en.wikipedia.org/wiki/Joseph\\_von\\_Gerlach#:~:text=Joseph%20von%20Gerlach%20\(3%20April,gelatin%20as%20a%20histological%20stain](https://en.wikipedia.org/wiki/Joseph_von_Gerlach#:~:text=Joseph%20von%20Gerlach%20(3%20April,gelatin%20as%20a%20histological%20stain). Accessed on 5 July 2024.

<sup>2</sup> Art and Medicine Archived 2013-06-08 at the Wayback Machine Die Photographie als Hilfsmittel mikroskopischer Forschung.

<sup>3</sup> “Catalogue of the very extensive and valuable library of works on anatomy, physiology, medicine, natural history, and relative sciences which belonged to the late Professor Goodsir: comprising ... to be sold by auction, by Mr. Dowell, within his book rooms, 18 George Street, Edinburgh, on Thursday and Friday, 28th and 29th November, 1867: commencing at twelve o'clock each day; on view on Tuesday and Wednesday, 26th and 27th November” (Edinburgh: Lorimer and Gillies, 1867), entry number 655.

<sup>4</sup> Gerlach, Josef von. “Mikroskopische Studien aus dem Gebeite der menschlichen Morphologie” (Erlangen: F. Enke (207), 1858). Royal College of Physicians of Edinburgh Library and Archives, Reference: Cf 9.20.

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