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Warren B. Davis and the Birth of Plastic Surgery in Philadelphia: A Historical Vignette

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Summary: The field of plastic surgery, formally organized in 1931 with the founding of the American Society of Plastic and Reconstructive Surgery, was shaped in many ways by a small practice of Philadelphia physicians. At the center of the practice was Warren B. Davis, a Philadelphia otolaryngologist and plastics pioneer whose innovations in cleft palate surgery would lead to significant improvements in functional and cosmetic outcomes in his time. In addition to his own innovations, Davis was responsible for the training of John Reese, the inventor of the Reese dermatome that changed the face of burn medicine during World War II. Aside from his contributions to surgery and the founding of the American Society of Plastic and Reconstructive Surgery, Dr. Davis was also the founder and first editor of the *Plastic and Reconstructive Surgery* journal which to this day is the premiere, authoritative journal of plastic surgery. Lastly, Dr. Davis established a plastic surgical practice, now Jefferson Plastic Surgery. Unique in its longevity, this practice would continue to shape the field of plastic surgery and continues to improve lives today—109 years after its founding in 1913. (*Plast Reconstr Surg Glob Open* 2022;10:e4675; doi: 10.1097/GOX.0000000000004675; Published online 16 December 2022.)

INTRODUCTION

The field of plastic surgery as we know it today has changed significantly since its formal commencement with the 1931 founding of the American Society of Plastic and Reconstructive Surgery (ASPRS), now the American Society of Plastic Surgeons (ASPS). Many authors have documented the history of plastic surgery, but none have yet told the story of how a unique group of Philadelphia surgeons and their practice became instrumental in many post–World War I innovations. At the center of this group was Dr. Warren Beagle Davis, the founder of the Warren B. Davis, MD practice (now Jefferson Plastic Surgery), one of the 10 founders of the ASPRS, and the first editor of the *Plastic and Reconstructive Surgery* (PRS) journal (Fig. 1). Dr. Davis and his associates would be responsible for major innovations in the field of plastic surgery, from developing the surgical repair of cleft lip and palate to the creation of a new generation of dermatome by his apprentice John Reese (Fig. 2).

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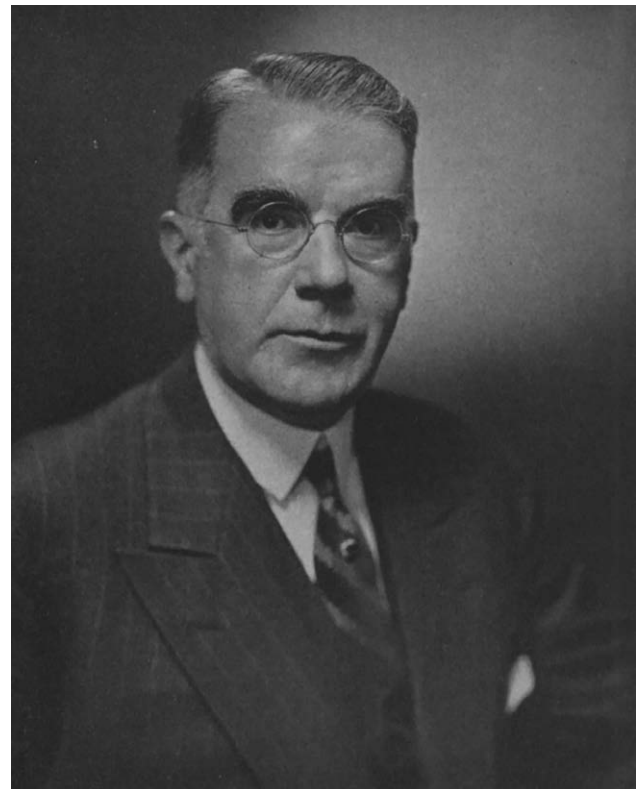


Fig. 1. Dr. Warren B. Davis, MD. Courtesy of the Thomas Jefferson University Archives.¹

Disclosure: The authors have no financial interest to declare in relation to the content of this article.

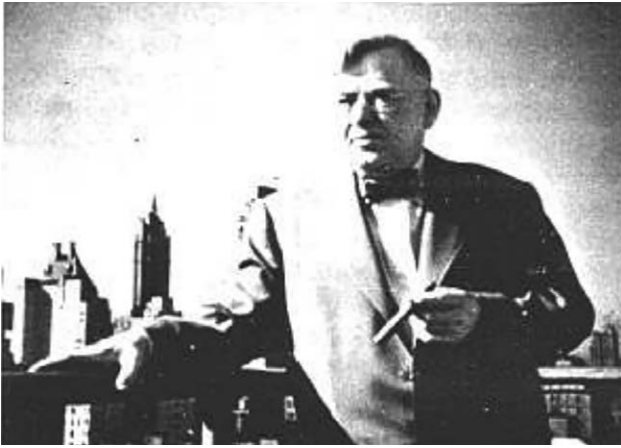


Fig. 2. Dr. John D. Reese. Courtesy of *Annals of Plastic Surgery*.² The Creative Commons license does not apply to this content. Use of the material in any format is prohibited without written permission from the publisher, Wolters Kluwer Health, Inc. Please contact permissions@lww.com for further information.

DR. WARREN B. DAVIS

Warren B. Davis was born on September 6, 1881, in Keane, Ky. and attended Jefferson Medical College from 1906 to 1910. Upon graduation, he completed a research fellowship at the University of Berlin under Dr. Ludwig Pick before returning to Philadelphia to start his own practice in 1913 and teaching at Jefferson Medical College.³ During his research fellowship, he published a monograph entitled “Development and Anatomy of the Nasal Accessory Sinuses in Man.”⁴ Dr. Davis was described by some as the “epitome of the Philadelphia gentleman”; a nurse who worked with Dr. Davis for 25 years said, upon his passing, “I found him to be a kind, conscientious, exacting, hard-working man, good and kind to everyone.”⁴

Dr. Davis was one of the 10 founding members of the ASPRS in 1931; he remained a fellow of this society throughout his career.^{3–5} Dr. Davis additionally served as the first editor of the *PRs* journal upon its inception in 1946.⁶ In the first issue of the *PRs* journal, a journal sponsored by the ASPRS, Dr. Davis wrote an editorial introducing this journal as the first publication exclusively devoted to the field of plastic and reconstructive surgery.⁶ To this day, the *PRs* journal remains one of the premier publications in the field.

In addition to his role in the ASPRS and *PRs* journal, Dr. Davis would become renowned in the world of plastic and reconstructive surgery for creating an innovative method for osteoplastic flap repair of the cleft palate.⁴ In 1928, he published a case series titled “Harelip and Cleft-palate: A Study of Four Hundred and Twenty-five Consecutive Cases,” documenting his technique as functionally and cosmetically superior to a mucoperiosteal flap alone.⁷ Before Davis’ innovation, osteoplastic flaps had a high rate of complications.⁸ Dr. Davis’ new technique involved a two-stage procedure; the first stage involved creating a mucoperiosteal flap, whereas the second stage involved creating an osteoplastic flap (Figs. 3 and 4). This technique allowed time to establish collateral circulation to the flaps between the procedures, resulting in an increased percentage of successful primary closures.⁷ Dr. Davis published several further articles

Takeaways

Question: How did Warren B. Davis and the practice he founded contribute to the development of the field of plastic surgery?

Findings: Dr. Warren B. Davis was one of the pioneers of early cleft palate surgery. His trainee, Dr. John Reese, was the inventor of the Reese dermatome that changed the face of burn medicine during World War II.

Meaning: Dr. Davis, Dr. Reese, and their plastic surgery practice made significant contributions to the field of plastic surgery at its inception—a legacy this century-old practice continues to this day.

detailing this technique, among the 26 peer-reviewed papers he published in his career.^{3,8} The Warren Davis technique, as it became known, was one of the most widely used techniques for cleft palatal closure after World War II.⁹

DR. JOHN D. REESE

Another significant development in plastic surgery that can be traced back to this Philadelphia practice is the invention of the Reese dermatome. Dr. John Davies Reese was born on August 20, 1893, in Scranton, Pa. (Fig. 2). He was a tenacious and intelligent doctor who overcame difficult circumstances—from childhood polio, which left him with a footdrop, to financial difficulties paying for his education—to graduate from Jefferson Medical College. Following his graduation, Dr. Reese completed his internship at St. Agnes Hospital before training at Dr. Davis’ office. Those who knew Dr. Reese well knew that nothing excited his interest so much as being told that an engineering problem was impossible.² When the new and innovative Padgett-Hood dermatome was invented in 1937, Dr. Reese was convinced the device needed improvement to obtain a predictable thickness—something that made the device difficult to use.¹⁰ When Dr. Reese created a prototype of his dermatome in 1945, the device was revolutionary in its precision and ability to create grafts of a uniform thickness.¹⁰ The Reese dermatome played a significant role in burn medicine during World War II when, thanks to medical innovations, soldiers with burns were living long enough to increasingly benefit from these grafts. Following Dr. Reese’s death, Dr. James Fox donated the original dermatome to his and Dr. Reese’s alma mater, Jefferson Medical College.³

THE FOUNDING OF A HISTORIC PLASTIC SURGERY PRACTICE

Along with his intellectual contributions to the field, Dr. Warren B. Davis also made the contribution of establishing a plastic surgery practice that would continue to run for over a century. His small Philadelphia practice, established in 1913, continues to this day. Today, this practice conducts all aspects of reconstruction and cosmetic surgery and trains general surgery residents as well as plastic surgery residents from local plastic surgery residencies. The longevity of this practice is secondary to its efforts to remain at the horizon of plastic surgery and to its incorporation of energetic and talented



Fig. 25.—Semidiagrammatic sketch showing unilateral cleft-palate and the outline of incisions (slight extension of the Langenbeck incision) used in loosening the mucoperiosteal flap on the side attached to the vomer and loosening the flap containing the rudimentary horizontal process of the maxilla and of palate bone on the opposite side. The latter incision is carried through the periosteum after which the horizontal processes are cut through with a very thin chisel.

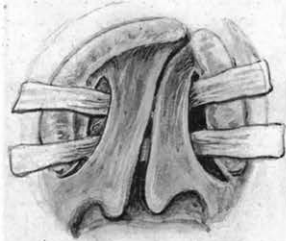


Fig. 26.—Semidiagrammatic sketch showing mucoperiosteal flap loosened on the patient's right side and a flap containing bone on the patient's left side. In the two-stage operation tapes are passed around both flaps and tied so as to hold the medial margins of the flaps in apposition, or nearly so, care being taken not to exert sufficient pressure by the tapes to shut off circulation. Iodoform gauze packs are used in the lateral incisions for twenty-four hours.

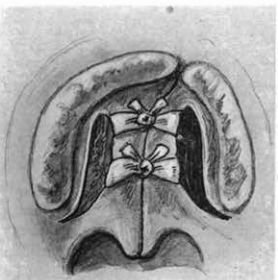


Fig. 27.—Semidiagrammatic sketch showing the tapes tied so as to hold the medial margins of the flaps in apposition. Iodoform gauze packs are used in the lateral incisions for twenty-four hours. One tape is removed on the third or fourth day, the remaining tape on the fifth or sixth day. On the seventh day the mucous membrane is removed from the margins of the clefts and sutures applied.



Fig. 28.—Semidiagrammatic sketch of bilateral cleft-palate, six or eight months after premaxilla has been placed in position and harelip repaired. Illustration shows the location of incisions which are carried down through periosteum, after which a thin narrow chisel is used to cut through the horizontal processes of the maxilla and palate bones. Incision is then carried entirely through the mucous membrane forming the floor of the nostril, and the entire horizontal portion of the palate brought medialward.



Fig. 29.—Semidiagrammatic sketch showing the method of loosening the flaps and bringing over bone in the repair of the double cleft-palate. The flaps are surrounded with two pieces of tape which are carefully tied so as to avoid cutting off any circulation. Iodoform gauze packing is used in the lateral spaces for twenty-four hours, both for the purpose of controlling any oozing and also to help hold the flaps in the desired position. One tape is removed on the third or fourth day, the remaining tape on the fifth or sixth day. On the seventh day the mucous membrane is removed from the margins of the clefts and sutures applied.

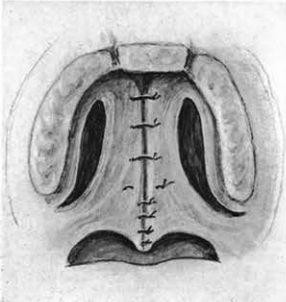


Fig. 30.—Semidiagrammatic sketch showing the application of sutures in a double cleft-palate in a two-stage operation. Double-ought wire sutures are used anteriorly, the sutures being carried through the entire thickness of the lateral flaps including the bone. These wire sutures are placed through the flaps before the mucous membrane is removed from the medial margins. This is important in that one is much less liable to detach the small strip of bone from its mucoperiosteal covering. One on-end mattress suture is used near the junction of the hard and soft palate. Posterior sutures are black silk. Tapes are again placed around the flaps as shown in figure 29, using care in seeing that they do not produce much pressure on the flaps. One tape is removed usually on the second or third day, the remaining tape on the fifth or sixth day. Remove only one or two sutures each day beginning about the ninth day and having all sutures removed on the fifteenth day after operation.

Fig. 3. The Warren B. Davis osteoplastic technique for cleft palate repair. Courtesy of *Annals of Surgery*.⁷ The Creative Commons license does not apply to this content. Use of the material in any format is prohibited without written permission from the publisher, Wolters Kluwer Health, Inc. Please contact permissions@lww.com for further information.

medical students and residents, who are treated as equals on the team and often become attending members of the group. In fact, this practice has had only four chairmen since its inception (Dr. Warren Davis, 1913–1947; Dr. J. Wallace Davis, 1947–1976; Dr. James Fox, 1976–2014; Dr. Steven Copit, 2014–present) and 11 staff plastic surgeons, all graduates of



Fig. 31.—Case VIII. Age twenty-eight years. Unilateral harelip, bilateral cleft-palate. Lip had been operated upon when patient was two years old and again when sixteen years old. Note that vermilion border was not properly removed from margins of cleft in lip, persisting as a disfiguring red line extending to floor of nostril.



Fig. 32.—Case VIII. Showing deviation of the nasal septum; flattening of ala nasi and contour of nostril. Wide bilateral cleft of palate.



Fig. 33.—Case VIII. Showing condition seven weeks after operation on palate, four weeks after operation on lip.



Fig. 34.—Case VIII. Showing contour of lip and nostril five months after second operation.

Fig. 4. One of Dr. Davis' patients who underwent osteoplastic repair of cleft lip and palate. Courtesy of *Annals of Surgery*.⁷ The Creative Commons license does not apply to this content. Use of the material in any format is prohibited without written permission from the publisher, Wolters Kluwer Health, Inc. Please contact permissions@lww.com for further information.

Dr. Davis' beloved alma mater, Jefferson Medical College.³ Although cleft palate surgery and skin grafts have developed and changed significantly since the founding of the field of plastic surgery, the contributions of Dr. Davis and Dr. Reese helped shape the field at its inception and improved countless lives—a legacy Dr. Davis' practice continues to this day.

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