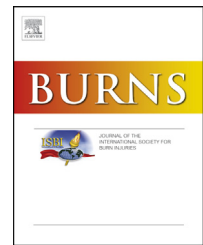


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A tribute to Cicero Parker Meek



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ABSTRACT

Cicero Parker Meek (1914–1979) was working as a general practitioner at the Aiken County Hospital in South Carolina, USA, and had a special interest in the treatment of burn patients. The procedure first presented in 1958 by Meek for a device-based expansion of split-skin (micrografting), which was invented before the mesh technique, is a milestone in the history of burns surgery. The method was forgotten until well into the 90s of the last century, and was only readopted and improved by no longer identifiable physicians at the Red Cross Hospital in Beverwijk. The Meek translation procedure was subsequently modified through the innovations of Kreis and Raff. With increased survival of massively burned patients, mesh grafting fell short of requirements. Mesh grafts of 1:9 expansion are difficult to handle and are vulnerable to dislodgement on the wound bed. Kreis and Raff showed in 1994 that 1:9 expanded mesh grafts did not achieve a true 1:9 expansion on the wound surface, in contrast to 1:9 expanded Meek grafts. Thus Meek grafts provided a highly effective autograft expansion in very large burns. Cicero Parker Meek was an exceptional person in the history of burn therapy.

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1. The Meek technique

One surgical procedure which is designed to circumvent the problem of the restricted areas of donor skin is the expansion of split skin. The Alexander technique involves the use of meshed split skin combined with allogenic skin. In this way expansion ratios of up to 1:9 are possible for the split skin, although such ratios are rarely implemented [1,2]. An alternative technique to split skin expansion is the method developed by Meek. This method for large split skin expansion ratios has been established in many burn centres throughout the world due to its less complicated transplantation procedure and its lower fragility compared to the wide-meshed mesh grafts, and can be

of particular benefit for very extensive burns compared to the mesh graft technique [3]. Raff et al. were also able to prove when using the Meek technique that with burns of up to 75% of the body surface area, the remaining non-burned skin is sufficient to act as donor tissue, and that grafting only needs to be performed once, thus circumventing the need for any additional skin culturing [4]. The management of major paediatric burns remains challenging, in part due to limited donor sites. Skin graft expansion facilitates rapid closure of the burn wound, reducing the risk of sepsis. Menon et al. combined modified Meek technique and cultured epithelial autograft (CEA). The Meek technique facilitates high expansion ratios, allowing for a greater area of skin coverage and epithelialisation in the burn wound appeared to be enhanced by the application of CEA [5].

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2. The Meek-Wall dermatome and its adaptations

Cicero Parker Meek (17/10/1914–19/04/1979) was working as a general practitioner at the Aiken County Hospital in South Carolina, USA, and had a special interest in the treatment of burn patients. In his article published in 1958 in the American Journal of Surgery, namely “Successful microdermagrafting using the Meek-Wall microdermatome”, he gave the first description of a device-based procedure for producing “postage stamp-like” small skin grafts [6]. His basic idea was that the keratinocytes in the transplanted skin grafts that would migrate from the islands to the periphery until they became confluent. He concluded that the healing of transplanted areas would be quicker, the longer the edges of the grafts were. Using a mathematical approach, he presented the principle that the sum of the quadratic edges of all the grafts is greater, the smaller the individual area of the transplanted rectangles is. From this idea he constructed the first Meek-Wall unit designed for micrograft transplantation. The device first described in the 1958 original article had a 13 blade cutter which was driven by an electric motor. In addition, flat plates of cork were described as carriers for the transplant, and the functioning of the device was also described. Initially, Meek saturated small (1/16 in. = 4 mm) skin islets in plasma and then transferred them by hand to parachute silk which he transplanted directly onto the wound bed. In February 1963 together with the engineer S.P. Wall, with whom he had designed the device, he submitted the Meek-Wall Dermatome for patenting at the United States Patent Office under the name “Microdermatome” ([7], Fig. 1). In 1965 Meek published a second article in which he reported on his experiences with the new technique and the individual steps of carrying out a transplantation using the Meek device in detail for the first time. The Meek procedure was then slowly forgotten after the introduction of the mesh graft technique in 1964, because the carrier-free, latticed mesh grafts could be produced more quickly, more inexpensively and much more easily so that they then became the procedure of choice [8]. Not until the early 90s was the Meek technique then taken up again and technically improved by Dutch surgeons at the Red Cross Hospital in Beverwijk, since as a result of successes in their intensive care therapy of severely burned patients, more and more large-area burned were being admitted for transplantation [9–11]. A specially developed glue spray for adhering split skin to plates of cork as well as modified nylon pleats was introduced. The clinical results of this modified Meek technique were first published in 1993 by Kreis et al. [12]. In the article, the authors recommended for the first time a combination of Meek grafts and allografts (foreign skin) with high expansion rates. One week after the autograft transplantation, the Meek nylon pleats could be carefully removed and the allograft skin could be transplanted over the adherent but non-confluent skin islets. In another article by Kreis et al. on the Meek technique from 1994, the authors compared the expansion rates of mesh and Meek transplants in an in vitro experiment, coming to the conclusion that an expansion ratio of 1:6 using the mesh technique corresponded to an expansion ratio of 1:4 with the Meek technique [13]. Another modification

Feb. 5, 1963

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MICRODERMATOME

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Filed Sept. 15, 1958

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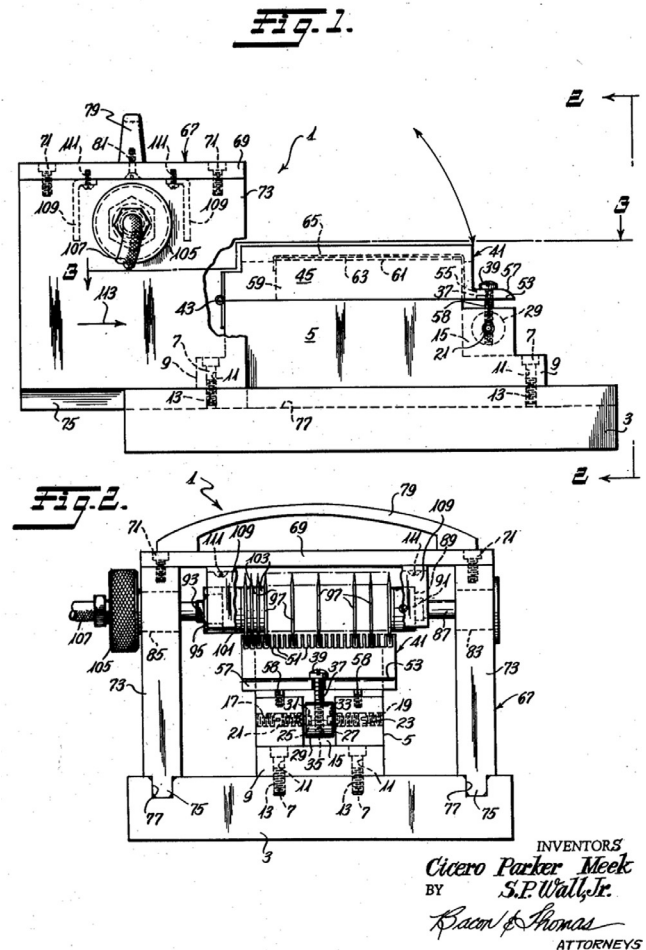




Fig. 2 – Aiken County Hospital in South Carolina, USA

CP Meek. The search for his descendants was also a frustrating exercise, although there are about 30 inhabitants named Meek in Aiken, CP Meek himself had no direct descendants. With the help of Susan French, Historic Preservation Planner for the City of Aiken, Meek's grave stone was tracked down to Forsyth, Georgia (Fig. 3). Cicero Parker Meek is buried there next to his parents Cicero Henry (1875–1938) and Minnie Parker (1877–1935). Regrettably, no grave could be attributed to a Mrs. Meek who might otherwise have been his spouse. Among those who were particularly helpful then was Mr. Ralph Bass, current president of the Monroe County Historical Society in Forsyth, Georgia, the place of Meek's passing. He was able to find him first in a newspaper article from 12/13/1953 (Fig. 4). One interesting point is that the article referred to him as a "young doctor" rather than a "young surgeon". In the second identified article Meek was referred to as "Dr. Meek", not a specialist in surgery, but rather a country doctor with a deep humanitarian interest in burns victims. This supports the hypothesis that Meek was not a surgeon, as was almost exclusively rumoured in the scientific and medical literature, which makes his contribution to burns surgery all the more extraordinary (Fig. 5).

More information which we could uncover thanks to the valuable help of Susan French and Ralph Bass illuminated other interesting aspects of his life. Cicero Parker Meek, better known as CP Meek or Parker Meek, came from a farming family in Monroe County, Georgia. His father, Cicero Henry Meek, was at first a farmer, like his father before him, and as indeed his uncles were. Parker, born October 17, 1914, was the youngest of six children to reach maturity. In the 1920s, Meek's

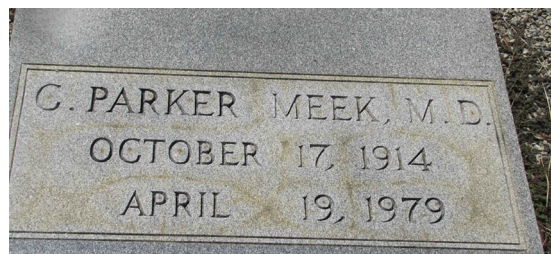


Fig. 3 – Gravestone of Cicero Parker Meek

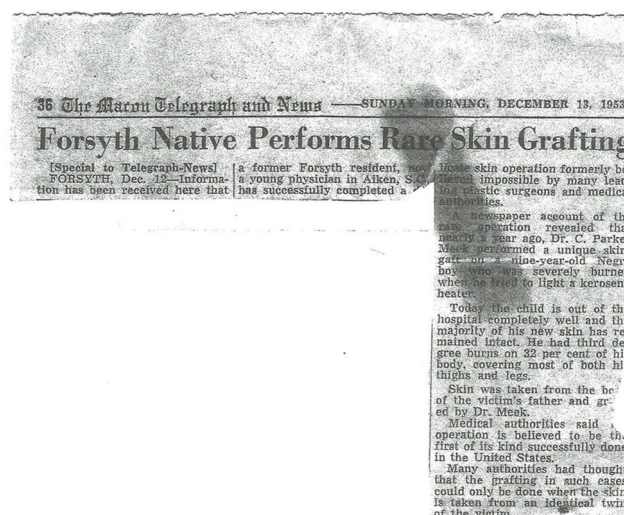


Fig. 4 – Newspaper article dated 13/12/1953

father made a move from the country to the town of Forsyth, where he established a small dry goods store, selling clothing and similar items. With the father working in Forsyth, the family moved into a house located on what is now North Lee Street in Forsyth. From this home, Parker walked the half-mile to Mary Persons High School from which he graduated in about 1932. He chose the nearby Mercer University in Macon as his college. It appears that none of his other siblings went to college. Parker was an exception in many ways. He spent 2 years at Mercer, covering the academic years 1933–1935. He initially embarked on a commerce or business major, but then left this school after his second year. These were difficult years in the United States because of the Great Depression, and so they were also difficult ones for Meek personally. Cicero Meek's store in Forsyth was a small one, and trade was slow. Meek's mother died in 1935 and his father in 1938. After leaving Mercer, Meek went to work for the Bibb Manufacturing Company in quality control, and while the evidence is not conclusive, this work probably took him to Porterdale, Georgia, where the Bibb Manufacturing Company was a major employer, and later to Columbus, Georgia, where he was in 1945. According to family members, Meek did not serve in World War II. There seems to be no documentation to explain why he was not drafted, as he was clearly of draft age. He may



Fig. 5 – Portrait of Cicero Parker Meek

have had physical problems, cardiac problems perhaps, but this explanation is merely conjecture. His mother suffered from heart problems, his father had died of a heart attack, and an older brother had had “ill health” for several years before his death at 46 in 1945. On June 5, 1950, Parker Meek graduated from the Medical College of Georgia, the state medical school located in Augusta. After graduation, he did his residency in South Carolina and was identified with that state for the rest of his life. His sister, Elizabeth, after her last divorce lived with him in South Carolina. She assisted in the development of the micrograft by perfecting the preparation of the gauze (double pleated) needed for the procedure. From his work with patients with burns, Dr. Meek also developed a clavicle brace for burn patients and he also studied acupuncture. Although Meek spent his professional life in South Carolina, he retained a love for his native state, and when he died of a heart attack in 1979, his body was returned to Forsyth for burial.

4. A tribute to Cicero Parker Meek

The procedure first presented in 1958 by Meek for a device-based expansion of split-skin (micrografting), which was invented before the mesh technique, is a milestone in the history of burn surgery. The method was forgotten until well into the 90s of the last century, and was only readopted and improved by no longer identifiable physicians at the Red Cross Hospital in Beverwijk. The Meek transplantation procedure was subsequently modified through the innovations of Kreis and Raff, but as to why they found themselves using the Meek technique more and more, very little information has been found. Cicero Parker Meek was an exceptional person who has gone down in the history of burns, and his dedication and passion towards improving the treatment of burned patients should never be forgotten. Through the pioneering invention of CP Meek, which, albeit in modified form, has now become routine in the surgical treatment of burns patients, the survival rate of burn patients has been significantly improved.

5. Conflict of interest

All authors disclose any financial and personnel relationship or conflict with other people or organisations that could inappropriately influence our work.

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