



Gaston Labat, John Lundy, Emery Rovenstine, and the Mayo Clinic: The spread of Regional Anesthesia in America Between the World Wars

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The spread of regional anesthesia in America was greatly facilitated by the work of Gaston Labat. Recruited to work at the Mayo Clinic, Dr. Labat there published his seminal textbook, Regional Anesthesia, in which he laid out his techniques to the next generation of physician specialists, notably John Lundy, Ralph Waters, and Emery Rovenstine. It was Rovenstine who was responsible for creating the specialty of anesthesiology in the 1920s and 1930s. John Lundy continued Labat's work at the Mayo Clinic when Labat left for Bellevue Hospital in New York. There, while teaching, Labat further developed and refined his techniques for delivering regional anesthesia. © 2002 by Elsevier Science Inc.

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Introduction

At the turn of the 20th Century, the Mayo Clinic, in rural Rochester, Minnesota, seemed an unlikely place for the occurrence of a major innovation in anesthesia. The Doctors Mayo, William J. (*Figure 1*) and Charles H. (*Figure 2*), were just beginning to gain the reputation that would send the world to their door. Working without the benefit of a medical school attached to their clinic, the Mayo brothers nevertheless practiced surgery with excellent results. But without a medical school, there were no interns to give anesthesia; consequently, the Mayo brothers relied on nurse-anesthetists for their patients' anesthetic needs. Ether anesthesia dominated and while there is little doubt that Alice Magaw and the other nurse-anesthetists were outstanding practitioners of the art of inhalational anesthesia, reporting on many thousands of cases without a death,¹ regional anesthesia was not practiced at the clinic for a variety of reasons.

The brothers Mayo were innovators in surgical technique. They borrowed the best of what they saw across the world on their frequent continuing medical education trips. On one such journey to Paris after the end of World War I, Charles Mayo observed the benefits of regional anesthesia as practiced in the clinic of Victor Pauchet, a surgeon who was especially interested in diseases of the colon and rectum. To operate in the abdomen, relaxation of the abdominal

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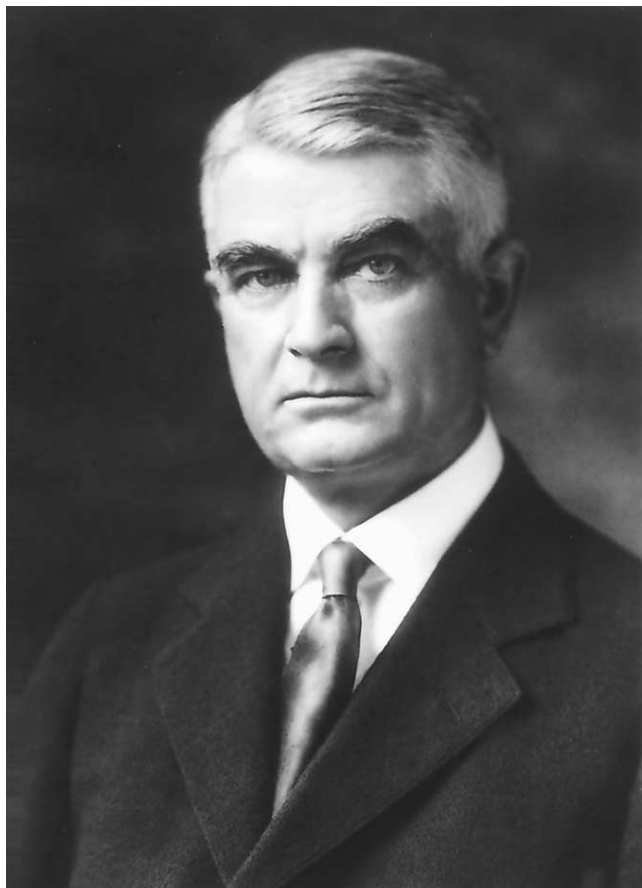


Figure 1. Dr. William Mayo (photograph courtesy of the Mayo Foundation, Rochester, MN).



Figure 2. Dr. Charles Mayo (photograph courtesy of the Mayo Foundation, Rochester, MN).

musculature was required, and Pauchet relied on regional anesthesia to provide optimal operating conditions. The patients were quiet, well cared for by a young surgeon turned regionalist, Gaston Labat, and did not suffer the nausea and pulmonary complications that followed deep ether anesthesia.² Charles Mayo was convinced that this anesthetic innovation needed to be transposed to the Mayo Clinic. Why did he think that this was so important? What advantages did the Mayo Clinic offer this young surgeon turned regional anesthetist that Dr. Charles was able to convince him to come to Rochester, Minnesota? How did this surgeon influence the course of American anesthesiology between the world wars?

Innovation?

On a trip to Paris in 1903, William Mayo saw Theodore Tuffier administer spinal anesthesia to a patient approximately 6 months after Tuffier's original demonstration. The local anesthetic used was cocaine. William Mayo dismissed the anesthetic technique, concerned that it would cause permanent neurologic damage.³ Indeed, over the next several years, there were many problems with spinal anesthesia and cocaine. Blocks were incomplete or did not occur at all, and patients became hypotensive. The

technique was abandoned in many centers that had extensively used it only several years before.⁴ It seemed that Dr. William Mayo's first fears about spinal anesthesia were being realized.

Anesthesia for abdominal cases was difficult. Deep ether anesthesia was required to provide adequate muscle relaxation for closure of the abdomen. Complications associated with deep ether anesthesia included a high incidence of atelectasis and subsequent pneumonia. Nausea and vomiting were also problems associated with ether anesthesia. Thus, there was the need for a better anesthetic for abdominal cases.⁵ The Mayo brothers would have been quite aware of this situation, because their fame had been made partly on their ability to resect cancers of the stomach, repair hernias, and remove diseased gallbladders.

In 1905, a new local anesthetic, procaine, was synthesized in Germany. Procaine offered many advantages over cocaine. Patients receiving cocaine often complained of "intolerable headaches, severe chills, high fever and uncontrollable vomiting".⁴ Spinal anesthetics with procaine were more solid and the length of block more predictable. However, problems with hypotension persisted, and the reasons were not well understood.

In 1920, Dr. Charles Mayo visited Paris and the surgical



Figure 3. Gaston Labat (photograph courtesy of the Wood Library-Museum, American Society of Anesthesiologists, Park Ridge, IL).

clinics of Dr. Victor Pauchet. While assisting Pauchet in an operation, Mayo was impressed with the work of Pauchet's young surgical colleague, Gaston Labat (*Figure 3*), who was applying the techniques Pauchet had taught him for providing regional anesthesia. Even with the patient awake, the abdomen was easily closed because the patient's abdominal muscles were relaxed. At the conclusion of surgery, Dr. Mayo was able to persuade Gaston Labat to leave Paris for the clinic at Rochester, Minnesota. Labat arrived on September 29, 1920, to assume his duties to teach regional anesthesia to the clinic's surgeons. For 9 months, he did just that.⁶ He also found time to produce a textbook at the clinic, *Regional Anesthesia: Its Technique and Clinical Application*.⁷

Labat's Text

Gaston Labat's textbook on regional anesthesia carried an introduction by Dr. William Mayo. In his essay, Mayo wrote, "I do not look forward to the day when regional anesthesia will wholly displace general anesthesia; but



Figure 4. John S. Lundy (photograph courtesy of the Wood Library Museum, American Society of Anesthesiologists, Park Ridge, IL).

undoubtedly, it will reach and hold a very high position in surgical practice".⁷ Why did William Mayo have such a change of heart?

Labat, through his use of regional anesthesia, was able to show that IA operations could be done safely without the complications of deep ether anesthesia. Moreover, Labat's approach to anesthesia was novel. Although regional anesthesia had enjoyed a resurgence with the introduction of the local anesthetic, procaine, it was not particularly popular in the United States. Thus, Labat's techniques in regional anesthesia were placed at the forefront of American surgical practice simply because they were being done at the Mayo Clinic.⁸ Labat was able to demonstrate to the host of visitors that he could avoid nausea and vomiting and many of the complications of spinal anesthesia if his methods were employed.⁹

Part of Labat's agreement in coming to the Mayo Clinic was to have support in producing a text on regional anesthesia.³ His text, *Regional Anesthesia: Its Technic and Clinical Application*,⁷ became, for a medical text, a best

³Letter from Gaston Labat to Charles W. Mayo, circa August 1921. Mayo Foundation Archives, Mayo Clinic, Rochester, MN.



Figure 5. Ralph M. Waters (photograph courtesy of the Wood Library-Museum, American Society of Anesthesiologists, Park Ridge, IL).

seller. Indeed, the second printing consisted of an even greater number of copies than the first. The book was very detailed, featuring numerous diagrams to demonstrate needle placement. There was an exact description of how much local anesthetic should be placed to secure the desired block.⁶

This textbook became “the bible” of regional anesthesia, influencing the first generation of American anesthesiologists, practitioners such as John Lundy (*Figure 4*), Ralph Waters (*Figure 5*), and Emory Rovenstine (*Figure 6*), who created the specialty of anesthesiology in the 1920s and 1930s.⁵ Many of the illustrations and techniques described are so precise that Labat’s textbook continues to be in demand some 80 years after it was initially published. In 1921, just prior to the publication of his textbook, Labat left the Mayo Clinic. It has always been assumed that he left for personal reasons; the Mrs. Labat who accompanied Dr. Labat to Rochester, Minnesota, was not same the Mrs. Labat whom Charles Mayo had met in Paris.⁶ However, at that time, Rochester, Minnesota, was a very small Midwest town, lacking much of the excitement that was available in Paris. Thus, it may be that Labat was not particularly happy at the Clinic and wished to live in a large metropolitan



Figure 6. Emory A. Rovenstine (photograph courtesy of the Wood Library-Museum, American Society of Anesthesiologists, Park Ridge, IL).

environment. Whatever his reasons, Labat left the Clinic and moved to New York City. On June 1, 1921, a junior associate of Labat’s, William Meeker, was made head of the section on regional anesthesia at the Clinic, where he and continued in that role until leaving the Clinic early in 1924.

On March 27, 1924, John Silas Lundy arrived to take over as head of the division on regional anesthesia. Over the ensuing years, Lundy would create the section on anesthesiology, which included regional anesthesia, general anesthetics, blood banking, recovery rooms, and early efforts at chronic pain management. Lundy devised a 3-month course on regional anesthesia which he led throughout the late 1920s. The purpose of the course was to teach physicians with an interest in regional anesthesia, including the basic blocks and approaches to producing this type of anesthesia.¹⁰ Perhaps his most fascinating pupil at this time was Ralph Waters. Waters worked as a volunteer assistant in regional anesthesia from July 5, 1926 until September 15, 1926. He performed at least 17 blocks, all of which were satisfactory. Shortly after leaving the regional anesthesia course, Waters went to the University

of Wisconsin in Madison and established one of the first truly academic departments in anesthesiology.

Labat's Life After The Mayo Clinic

When Labat left the Mayo Clinic in 1921, he accepted a position at Bellevue Hospital of New York University in New York City. There, he, too, developed a 3-month block course that was advertised in both *Current Researches in Anesthesia and Analgesia*,¹¹ the new journal devoted solely to anesthesia that appeared for the first time in 1922, and also in the *British Journal of Anesthesia*,¹² which published its first issue in 1924. Throughout the 1920s until his death in 1934, Labat taught regional anesthesia to physicians and gave regional anesthetics for the surgeons at Bellevue Hospital. Finally, Labat established a private block clinic in New York City to help treat chronic pain. Labat died in 1934 of complications from an acute attack of cholecystitis.⁶

Approximately 2 years after his arrival in New York City, his colleagues organized the American Society of Regional Anesthesia in honor of Gaston Labat for his many contributions to regional anesthesia. However, Labat did not feel comfortable with the society being named after him and insisted the group be known simply as the American Society of Regional Anesthesia (ASRA).¹³ The group met in conjunction with other anesthesia societies and published its early proceedings in *Current Researches in Anesthesia and Analgesia*.^b After 1929, the Society's proceedings were no longer published. However, mimeographed Minutes, which contained the titles of the papers presented,

^bArticles appearing in *Current Researches in Anesthesia and Analgesia*, 1924–1926.

^cLetter from Edward Livingstone to John Lundy, August 15, 1925. The Collected Papers of John S. Lundy, Mayo Foundation Archives, Rochester, Minnesota.

^dCarbon copy of a letter from John Lundy to Edward Livingstone, August 7, 1925. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^eLetter from Gaston Labat to John Lundy, March 2, 1927. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^fCarbon copy of a letter from John Lundy to Gaston Labat, March 11, 1927. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^gLetter from Gaston Labat to Ralph Waters, April 13, 1928. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^hCarbon copy of a letter from John Lundy to Gaston Labat, March 30, 1929. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

ⁱLetter from Gaston Labat to John Lundy, September 5, 1929. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^jCarbon copy of a letter from John Lundy to Gaston Labat, September 16, 1929. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

^kCarbon copy of a letter from John Lundy to Gaston Labat, October 28, 1929. The Collected Papers of John Lundy, Mayo Foundation Archive, Rochester, Minnesota.

and occasionally the paper itself, have been preserved in the archives of the Wood Library-Museum at the American Society for Anesthesiologists in Park Ridge, Illinois. In the late 1920s to the 1930s, the ASRA's emphasis shifted from being concerned solely with surgical anesthesia to exploring chronic pain management.¹⁴

The ASRA became a conduit for Lundy and Labat to communicate with each other. In October, 1925, Lundy was invited to present a paper before the group^c on the comparative value of regional anesthesia, covering some 2,652 cases between July 1, 1924 and July 1, 1925.^d Early the following year, Labat asked Lundy to join the ASRA and its program committee. In his letter, Labat wrote, "The Committee hopes that you will accept this invitation since the work that you are doing at the Mayo Clinic is considered one of the best contributions to the use of the regional method in the States."^e After this initial contact, Lundy was concerned that the early history of the section on regional anesthesia would be lost. He requested that Labat send him reprints of articles published during his time at the Clinic so as to preserve that portion of the department's history.^f

Membership for physician-anesthetists in the ASRA was evidently important for Lundy. He wrote to Labat proposing Ralph Waters for membership in the ASRA^g after Waters' Mayo Clinic training. One year later, in early 1929, Lundy wrote to Labat informing him that he would be in New York City in late September.^h Labat was happy to have Lundy present before the ASRA, and he asked to be notified of Lundy's arrival date so that the two might have dinner together.ⁱ In his address to the ASRA membership, Lundy presented his latest work involving barbiturates as sedatives in regional anesthesia.^j The meeting must have gone well between the two men, for in October, Lundy thanked Labat "... for your courtesy and kindness to me while I was in New York City. . . ."^k

The Labat Tradition at Bellevue

In 1935, after the death of Labat, Emery Rovenstine accepted the position as chief of anesthesia at Bellevue Hospital. It was the desire of the Bellevue surgeons to continue the Labat tradition, and Rovenstine was also brought in for his particular expertise in thoracic surgery. Many Bellevue patients had died while undergoing lobectomy and pneumonectomy procedures, and it was believed that Rovenstine's expertise with one-lung anesthesia as taught by Ralph Waters at University of Wisconsin at Madison, as well as his expertise with the new drug cyclopropane, would reverse this appalling trend. Rovenstine did not disappoint his new Bellevue colleagues.¹⁵

But Rovenstine was more than just a thoracic anesthesiologist. His interest in regional anesthesia was piqued at a meeting with Labat long before Rovenstine arrived in New York City. Rovenstine was determined to continue the Labat tradition. With the help of Hippolyte Wertheim, a Bellevue surgeon who was trained by Labat, Rovenstine achieved his goal. Wertheim then introduced him into the ASRA.¹⁶ Within 2 years of Rovenstine's arrival in New York, he became president of the Society, and over the

next 15 years, Rovenstine would direct what he described as the "only honest-to-God block clinic in the country". Rovenstine's interest in block anesthesia for chronic painful conditions led him largely to abandon his operating room practice. Ralph Waters, his mentor and friend, chided him for his shift in practice. Waters reminded Rovenstine that the operating room practice was crucial to continue the academic mission at NYU and Bellevue. To be absent from the OR for long periods of time meant that Rovenstine was no longer teaching medical students and residents, who were the future of the specialty.¹⁷

Perhaps the most telling indication of the influence that Labat had on his pupils, Lundy and Rovenstine, became apparent during the formation of the American Board of Anesthesiology (ABA) in 1938. This group defined what it meant to be an anesthesiologist, and what knowledge they wished to find in candidates to the Board. In the ABA's first written examination, which was administered in March 1939, the subject of regional anesthesia played a large role. The first written examination was an essay test in five sections. Candidates had to answer three of five questions in each section and then have their answers graded by the members of the Board. In the anatomy section, all of the five questions were based on regional anesthetic blocks; in the pharmacology section, two of five questions dealt with regional anesthesia and the effects of local anesthetics; finally, in the pathology section, one of the five questions concerned the subject.¹⁸

Conclusions

For regional anesthesia to gain popularity in America, it needed to be accepted by a large number of surgeons. The Mayo Clinic in the early 1920s, one of the leading surgical institutions in the United States, understood the importance of Labat's teaching. From this platform, regional anesthesia could be popularized. In addition, the publication of *Regional Anesthesia: Its Technic and Clinical Applications*⁷ with the resources of the Mayo Clinic's editorial department and illustrators, allowed Labat and regional anesthesia to move in a new direction.

John Lundy found many reasons to continue the Labat regional anesthesia tradition. As Lundy established postgraduate education in anesthesiology, regional anesthesia played a major role. Emory Rovenstine, who became interested in regional anesthesia through one of Lundy's pupils, Ralph Waters, and Labat himself, continued the Labat tradition when he took over as chief of anesthesia at Bellevue. With the help of Hippolyte Wertheim, Rovenstine was able to become president of the American Society of Regional Anesthesia, a group that he could then maneuver into position as a second national anesthesia organization to endorse the creation of the American Board of Anesthesiology. Without the support of the

original ASRA, the ABA would not have come into being in 1938.

It is through the ABA's written examinations that the importance of regional anesthesia to the field is so apparent. Regional anesthetic techniques and their complications received particular emphasis. Thus, as a result of his transatlantic trip, Labat, through his pupils, was able to change the course of American anesthesiology. His book and his work influenced the generation that defined anesthesia as a physician specialty in the United States. It is doubtful that without his influence, Drs. Waters, Rovenstine, and Lundy would have taken up the cause of regional anesthesia as vigorously as they did.

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