Kurt Semm and an Automatic Insufflator

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ABSTRACT

Work on tubal insufflation marked the beginning of Kurt Semm's (b. 1927) scientific career. In the early 1960s, he directed his attention to the fact that, from a technical standpoint, tubal insufflation was similar to creating pneumoperitoneum. In the mid-1960s, Semm - himself a gynecologist - invested his time and financial resources and risked his university career to develop an automatic abdominal insufflation device. Later he tried it out in the Clinic for Internal Medicine. Since, at that time, the term "laparoscopy" had negative connotations associated with it, Semm formulated a new term "pelviscopy." In 1967, Semm presented his invention to Melvin Cohen, an American pioneer of gynecological laparoscopy, at the meeting of the American Fertility Society, held in Washington.

INTRODUCTION

In the winter of 1944/45, Germany's military situation became hopeless. Allied troops liberated France, Holland, and Belgium, and the Soviet Red Army swept through the Eastern European countries. With their air superiority, Allied planes regularly bombed German troops and supplies, as well as bridges, roads, train tracks, factories, and civilian centers. As the Third Reich collapsed, the Nazi government conscripted teenage boys into the military. While a March 1940 Nazi youth protection law prohibited persons under eighteen years from seeing adult movies, drinking alcohol in restaurants, smoking in public, or even walking the streets after dark, the government equipped teenagers for war and death.[1] "On January 15, 1945, at the age of seventeen, I was drafted into the army. I was ordered to fight to the death to defend the Führer and the 'Fatherland,'" recalls Kurt Semm (b. 1927) a half-century later. "Our lives were very cheap to the Nazis."[2] By 1945, nothing could stop the Allies' march from the East and West. Semm was taken prisoner by the Soviets. In late 1945, Semm returned to Munich.

Semm's Medical Studies

Like many others, Semm faced the task of rebuilding his life. In the spring of 1946, he began medical studies at the University of Munich. Along with almost all of his classmates, Semm worked to finance his education. In the beginning, he designed, produced, and sold toys. He later gave private lessons in anatomy, biology, and physics to first-term medical students. After his medical studies, Semm worked in a pathological institute and then in internal medicine. In the fall of 1951, Semm began his training at the Second Women's Clinic.[3]

In the early 1950s, Semm's chief - Richard Fikentscher (1903-1993) - began work on utero-tubal insufflation and introduced his young assistant to animal studies. Semm quickly became engrossed in research and spent every free moment in the laboratory. Semm states:

> This was a time of need, post-war time. We had very limited budgets. I spent long, long hours working with my drill, hammer, and screwdriver. Every part, every detail of the insufflation device was designed, constructed, and finally built by myself.[4]

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Whatever the technical dilemma, Semm dealt with it calmly and directly. He honed an array of technical skills, including the ability to think through the most challenging problems. This aptitude and perseverance stood him in good stead in his later career. In 1955, Semm presented an insufflation device for diagnostic work on the fallopian tubes. "One by one, we began to publish numerous articles on this topic, in both the German and French medical press," notes Semm.[5]

From Tubal Insufflation to Pneumoperitoneum

In the early 1960s, Semm directed his attention to the fact that tubal insufflation was quite similar to creating a pneumoperitoneum. In both procedures, carbon dioxide was injected into the human body. As early as 1943, Palmer had grasped this connection and created pneumoperitoneum with the Bonnet device which was primarily designed for tubal insufflation.[6] Semm's own work with the device for tubal insufflation encouraged him to undertake trials with pneumoperitoneum.

At that time, internists were still creating pneumoperitoneum by pumping in air by hand. Few gynecologists possessed Palmer's or Frangenheim's devices. Semm recognized the need for an insufflator device specially designed for laparoscopy. He identified the technical criteria needed to be fulfilled by an abdominal insufflator. In the first place, he concluded, that intra-abdominal pressure had to be controlled continuously. Secondly, one had to limit the insufflation flow and to register the volume of insufflated gas. Semm trusted his technical skills and was convinced that he could build an abdominal insufflator without outside assistance. However, he first had to answer the question of where to conduct clinical tests with his invention.

The Second Women's Clinic in Munich under the leadership of Fikentscher was not a suitable place for Semm's insufflator. No one had experience with endoscopic techniques. Moreover, convincing Fikentscher to try the device seemed impossible. Even such outstanding gynecologists as Raoul Palmer could not overcome Fikentscher's skepticism of laparoscopy. Driven by optimism and determination to perfect his innovative device, Semm took a rather unorthodox approach. He explains:

> I knew a fellow working in the Clinic for Internal Medicine in Munich. His name was Eisenburg. He performed laparoscopy, mostly as a liver diagnostic, and created pneumoperitoneum by using a cylinder about 40 cm long and 15 cm in diameter. I presented Eisenburg with my idea of an automatic insufflation device and we agreed to try it out in internal medicine.[7]

Semm had only the most basic tools at his disposal. "Again, I built every part of this apparatus by myself," he recalls. "Eisenburg soon began filling the abdomens of his patients by using my device. He was overjoyed."[8]

Despite the first clinical successes with his insufflator, Semm hesitated to inform Fikentscher of his breakthrough. Semm wanted to avoid confrontation with his superior's dominant personality. He placed himself under a great deal of psychological strain because he would not have been covered had something gone wrong. Semm remembers his deep concern:

> I had a constant feeling of fear. You have to remember, I had clinical experience with tubal insufflation, and at that time deaths due to gas insufflation into tubes had been reported - air emboli. I was afraid that a patient in the Internal Medicine Clinic would die of air embolism and my apparatus would be blamed. Therefore, the lost gas was not automatically replaced, not at all. The flow was limited to only one liter per minute. I was careful every step of the way. One dead patient and I would be finished. Forever![9]

At that time, the First Clinic for Internal Medicine at the University of Munich was directed by Herbert Schwiegk (1906-1988). Like many internists in Germany, he appreciated the value of laparoscopy, especially in liver disease. One day Schwiegk expressed his praise of Semm's insufflation to his friend, Fikentscher, saying, "We are very glad that Semm built the insufflation device for us. Performing laparoscopy is now much easier and safer." When Fikentscher returned to the Women's clinic, a storm broke loose. According to Semm, "I was called into his office, where he was shouting incredibly loud." Like many other experts, Fikentscher tended to regard the ideas of his assistants as his own property. How could "his Semm," without his knowledge and approval, work outside his clinic? And where had he gotten the idea of constructing an apparatus for laparoscopy? In the following months relations between Fikentscher and Semm were tense.[10]

Some months later, Rodriguez Galindo of Buenos Aires came to the Second Women's Clinic in order to carry out cytological research on vaginal cancer. Galindo had already observed Palmer's coelioscopy in Paris.[11] Like many others, he became fascinated with abdominal endoscopy. Unaware of Fikentscher's view of endoscopic techniques, Galindo repeatedly asked if he could perform laparoscopy. He enjoyed special status in the clinic and Fikentscher relented in his ban on laparoscopy. Using the internists' instruments, Galindo performed laparoscopy under general anesthesia, as Palmer did. Fikentscher waited patiently and then peered through an

endoscope into the patient's body. "He was looking, I think, for at least two or three minutes. He then pronounced, 'Brilliant! Gentlemen, I tell you brilliant'," recalls Semm.[12]

The Origin of the Term "Pelviscopy"

Fikentscher gave Semm a free hand and Semm quickly expanded his expertise with laparoscopic technique. He also devoted a great deal of energy to promoting his device and the technique itself at other clinics. Soon, however, Semm came under pressure from academic gynecologists. According to Semm, the term "laparoscopy" had particularly negative connotations associated with it, due to accidents that had occurred in internal medicine. In order to distinguish the procedure as it pertained to internal medicine from that in gynecology, Semm formulated a new term, "pelviscopy." He contacted Willibald Pschyrembel (1900-1987) of Berlin. Pschyrembel was a recognized authority in the field of medical terminology and publisher of the Clinical Dictionary which was widely accepted in German-speaking countries. With Pschyrembel's support, the word "pelviscopy" became part of official medical language in the late 1960s.

Semm's Insufflator in the United States

In April of 1967, Semm represented the GSSFS (the German Society for the Study of Fertility and Sterility) at a meeting of the American Fertility Society, held in Washington, DC. Melvin Cohen of Chicago had become familiar with laparoscopic techniques during a prior tour of Europe (visiting Palmer in France and Steptoe in England) and displayed his exhibit "Culdoscopy versus Peritoneoscopy" with endoscopic photographs.[13] Those present at the Washington meeting debated the advantages and disadvantages of laparoscopic procedures, as well as the technical problems involved. Semm intended to participate in this discussion. He describes his experience:

> I went to Mr. Cohen and said in a friendly way that I wanted to highlight my insufflator. He looked at me and said that if I had any technical questions, I should contact his technician. There was in fact a short man standing next to us who made instruments for Melvin Cohen. Once more I said that I wanted to highlight my insufflator. The technician glanced at me and stated dryly: "We are not interested in a German apparatus."[14]

Like many Germans after the war, Semm was sensitive to such comments and reacted accordingly. "Leck mich am Arsch, du blöde Sau," screamed Semm at the short man. Translated directly, Semm was suggesting that the technician kiss his ass, although the German version carries more the connotation of "you idiot." Perhaps Semm wanted to avoid a scene and decided to express his reaction in German. In any event, to Semm's astonishment the technician responded in fluent German, clad in a Bavarian accent, "Was haben Sie gesagt? Soll ich Sie am Arsch lecken?" ("What did you say? You want me to kiss your ass?"). And then, one Bavarian to another, the instrument-maker asked, "Are you from Munich too?"[15]

Cohen's technician, Ludwig alias Louis Streifeneder, was in fact born in Germany. He had been forced to leave his homeland in the 1930s, along with countless other people of Jewish background. Streifeneder came to the United States where he founded his own company, the Eder Instrument Company.[16]

Once Bavarian, always Bavarian. The regional patriotism of Bavarians often exceeds their identification with the country as a whole. They cultivate a distinct dialect (hardly intelligible to non-Bavarians), as well as customs and manners that connect them all over the world. "We sat down and began to talk, naturally in our own language," reminisces Semm. "We had a wonderful discussion. Streifeneder said to me, I'll try to help you and talk with Cohen." Indeed, back in Munich, Semm received a letter from the instrument-maker with the news that Cohen wanted to test Semm's insufflator. Semm recounts how his insufflator was received on the other side of the Atlantic:

> I sent him one device. Soon I received a second letter stating that Cohen was very pleased with how my insufflator had performed in experiments. Cohen asked for another one, which I sent to him. Both devices were built by myself at considerable cost in terms of time, energy, and money. Cohen never paid for them. He only pictured my insufflator in his book [published in 1970]. Then I received a letter from a Mr. Wappler of the American Cystoscope Makers Inc. He ordered one hundred insufflators. One hundred!! At that time we were building no more than thirty devices a year! More than four hundred insufflators were ordered over the following months. One had the impression that in America laparoscopy had exploded.[17]

From the very beginning, the Semm insufflator set off heated reactions in the medical community. When Semm's experiments with laparoscopy became known in the field of gynecology, many academic gynecologists pronounced him mad. Semm entered endoscopy with vigor and invested a great deal of personal time and financial

resources. He risked his university career to realize his vision, displaying remarkable self-assurance and determination. Semm was accused of copying his device from Palmer or Frangenheim and selling it under another name. Although Semm argued that his design was quite different, he was unable to convince critics in Germany. On the other side of the Atlantic, American physicians and instrument-makers appreciated the Semm insufflator and valued its simple application, clinical usefulness, and safety.

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