The question is- - how will we anesthetize this patient for thoracic surgery? Our options are: 1. Cyclopropane. We would hand hyperventilate the patient down to an apneic state to keep the diaphragm and mediastinum quiet. This was the usual procedure for the opening field of thoracic surgery. However, the surgeon would be deprived of the electrocautery with this explosive agent, which was quite a handicap for most surgeons.

2. Ether. This would produce sufficient anesthesia, but we could not stop the diaphragm and it too was flammable.

3. N2O. Though it would allow the electrocautery, it was not produce apnea and was not even potent enough to intubate the patient. Perhaps with some local anesthesia supplement, this was the usual procedure in the thirties for what little thoracic surgery was done. The patient was anesthetized with a mask and allowed to breath on his own.

Shortly I will show you a video of a film made 48 years ago which demonstrates how we solved the problem. The anesthesiologist was Fred Beckert, who now lives in Tempe, Arizona. I was his assistant. The technique was developed and the film produced by Dr. Phyllis Harroun, our teacher. Fred and I agreed that whenever we showed the tape we would make it clear that the presentation is to honor the memory of the late Dr. Harroun who had devoted her life to the art of anesthesiology and to make known the name of Dr. Phyllis Harroun in the annals of the history of anesthesiology.

Phyllis' ambition was to develop a simple technique which would allow working in the chest with the use of the cautery. Her ambition offered promise when she came across the book, "White Water and Black Magic" by Richard Gill. He had a ranch in Ecuador and was interested in the properties of plant extracts used by the Indians in the upper Amazon Basin, including curare. He made expeditions into that area and though the production of curare was a ritual procedure, he gained enough confidence from the Indians that they made him an honorary witch doctor and allowed him to observe and make notes on the plants gathered and the extraction procedure. He returned to his home base in New York and arranged with Squibb Laboratories for a large supply of Chondrodendron Tomentosum to be shipped from the jungle. The
Squibb laboratory was successful in producing a purified product which they called Intocostrin. It was standardized by a rabbit head drop test. When pure d-Tubocurarine was developed later it was packaged at the same potency. The first use was for spastic paralysis and to prevent breaking bones in shock therapy. These were only partially successful. It was introduced into anesthesia starting in 1942, but the first attempts were not encouraging. Gradually, it came into use. Small doses given as an adjunct (crutch) with cyclopropane. It was heresy to stop someone from breathing and diminished respiration was listed as the main complication in early reports.

Dr. Harroun got to wondering if a patient would survive a total apneic dose of curare. In her search of the literature she found an old report of where an adventurer Charles Waterton had brought back a sample of curare from South America. In 1814, he and an English surgeon, Brodie, gave a donkey a massive dose of curare, did an immediate tracheotomy, inserted a fireplace bellows and ventilated the donkey until it got up and walked away. It lived for another 25 years. Dr. Harroun was encouraged by this report. It might lead to achieving her life long ambition. It was simple to demonstrate that unanesthetized dogs could be completely curarized and yet survive. But they did not all survive. Now came the difficult task of determining what the criteria were for extubating the animal. It was learned that the animals had to be artificially ventilated until the IC muscles were contracting vigorously. Otherwise the animal would die from hypoxia due to atelectasis.

While the main intent of Dr. Harroun was to develop a technique that would permit the use of cautery inside the chest, it was soon realized that any agent which of itself could not produce adequate relaxation could become a useful agent when assisted by curare. Now there are better agents and relaxants available. However, using light anesthesia with non-flammable agents and relaxants is the basis of most modern general anesthesia which is grounded in to fundamental research and technique developed by Dr. Harroun.