

CORRESPONDENCE

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In Defense of Waters, Blalock, and Taylor

To the Editor:—We applaud the recent article¹ that highlights the career of Dr. Lamont, a frequently overlooked figure whose major contributions followed a pattern learned from his mentor, Ralph Waters. The Waters model for an academic department of anesthesiology required that four basic criteria be met to facilitate successful developments as they were seen at the University of Wisconsin in Madison from 1927 to 1948. First, surgeons had to support the anesthesiologists' efforts. Second, support of the basic scientists was needed, including a willingness to collaborate on research efforts of mutual interest. Third, residents and medical students had to be available for instruction and introduction to clinical anesthesia. Finally, financial support for research and adequate staff was necessary.² These were the principles shared by Waters with his resident group, which included Lamont and Dripps.

During Lamont's struggles at Johns Hopkins, Blalock was initially supportive of the intent to build a program on the Wisconsin model. In a letter to Waters dated February 9, 1946, Lamont wrote about a letter of resignation he had been about to send to the University Board. Having sent it first to Blalock for comment, Lamont informed Waters that Blalock said "Please don't. I'm sure the University will accept your proposals. As for the money, you can have \$10,000 from the University for Anesthesia tomorrow. Please give us a little more time."³ Two months later, the situation changed, and Lamont was

denied the funding and the additional staff necessary to move toward an academic program. Blalock was a member of the committee that recommended against Lamont's proposals.[†] Where Blalock stood on these issues remains unclear. However, Lamont's letters tend to argue against a flat refusal of Lamont's proposals by Blalock.¹

The history of the Department of Anesthesia at the Hospital of the University of Pennsylvania is a bit more complex than suggested by Murvachick and Rosenberg. The brief mention of Ivan Taylor is somewhat misleading and a bit unfair. Taylor had a full 3-yr residency with Waters and Rovenstine, and a subsequent 2-yr experience as a departmental staff member with Waters at the Wisconsin General Hospital. When appointed at the University of Pennsylvania as the first physician anesthesiologist, Taylor came, in September 1938, into a most unfavorable situation in an institution where inhalation anesthesia had been in the hands of nurse anesthetists for 30 yr. He was caught in a situation where only one of several surgeons, I.S. Ravdin, offered full support. Taylor had a large clinical load to shoulder, as well as being the sole supervisor of nurse anesthetists and teacher to medical students and interns. He was frustrated by not having sufficient time and support for research activity. The Board of Managers for the hospital further complained that anesthetic fees had not increased sufficiently to justify an increase in the anesthesia budget.³ Taylor stayed at the University of Pennsylvania for nearly 3 yr, hoping things would improve, but when he received a better offer from Wayne State University, he took it.

During World War II, Dripps threatened to leave the Anesthesiology Department at the University of Pennsylvania. It was in a series of letters between 1941 and 1944 that Ralph Waters counseled Dripps to be patient, that manpower would be more than sufficient after the war.[‡] Dripps, during the war, faced the same conditions and problems as Taylor had, but Dripps, because of having been at the University of Pennsylvania for several years, and by working also with the Pharmacology Department, ultimately found more support. Consequently, Dripps may have had a greater ability to negotiate the necessary agreements with the hospital's Board of Managers.

* Letter from Austin Lamont to Ralph Waters, February 9, 1946. The Collected papers of Ralph Waters, M.D., Steenbock Library Collection, University of Wisconsin, Madison, Wisconsin.

† Letter from Austin Lamont to Ralph Waters, April 20, 1946. The Collected Papers of Ralph Waters, M.D., Steenbock Library Collection, University of Wisconsin, Madison, Wisconsin.

‡ Letters between Ralph Waters and Robert Dripps. The Collected Papers of Ralph Waters, M.D., Steenbock Library Collection, University of Wisconsin, Madison, Wisconsin.

CORRESPONDENCE

Douglas R. Bacon, M.D., M.A.
 Assistant Professor of Anesthesiology
 State University of New York at Buffalo
 Chief, Anesthesiology Service
 Veterans Affairs Western New York Healthcare System

Richard Ament, M.D.
 Vice-Chairman for Education and Clinical Professor
 of Anesthesiology
 State University of New York at Buffalo
 3495 Bailey Avenue
 Buffalo, New York 14215

Lucien Morris, M.D.
 Emeritus Professor
 Medical College of Ohio
 P.O. Box 10008
 Toledo, Ohio 43699

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Venous Gas Embolism from an Argon Coagulator

To the Editor:—We report a near-fatal perioperative incident recently experienced in our institution. The patient was a 21-month, 10-kg girl who had received a living-related liver transplant 2 months earlier. She was scheduled for laparotomy to biopsy two hepatic nodules suspected to be of lymphoproliferative origin. Nasotracheal intubation was performed after mask induction with sevoflurane; a double-lumen central venous catheter was inserted using the right subclavian approach and its tip was positioned under fluoroscopic control at the junction of the right atrium and the superior vena cava. Anesthesia was maintained with isoflurane, nitrous oxide, sufentanil, and atracurium.

The first hepatic nodule was resected easily, but the second was difficult to excise, so only biopsies were performed with a Hepafix needle (Braun, Germany).

To control the local bleeding that followed, the surgeon used an Argon beam coagulator (Bircher; gas flow 60 SL PM). This was followed by a sudden disappearance of the capnogram, followed by bradycardia, hemoglobin desaturation, and, finally, cardiac arrest. The administration of isoflurane and nitrous oxide were discontinued, ventilation was controlled with 100% oxygen, the patient was placed in Durant's position, and external cardiac massage was started. Aspiration through the central venous catheter yielded \pm 10 ml gas, which confirmed the suspected diagnosis of venous gas embolism. Epinephrine ($3 \times 50 \mu\text{g}$), 50 ml colloid, and 0.5 mg atropine were administered before a cardiac rhythm reappeared. Total duration of resuscitation was approximately 5 min. An arterial catheter was placed, and blood gas analysis showed mixed acidosis, with hypercapnia and lactic acidosis (maximal level observed: 5.6 mM).

The rest of the operation proceeded uneventfully. The patient was transferred to the pediatric intensive care unit for postoperative

treatment, where there was evidence of posthypoxic cerebral sequelae. We hypothesize that argon was injected under pressure in hepatic vein(s) opened by the liver biopsies.

This case report shows the possible risk of a gas embolism associated with the use of argon enhanced coagulation. Argon enhanced coagulation (AEC) is a method of operative coagulation of tissues that uses a jet of argon gas encompassing an electrofulguration arc. To our knowledge, this is the first time this problem is reported outside the setting of laparoscopic surgery.¹⁻³ As shown previously in animal experimental studies, the following are recommended⁴:

1. anesthesiologists should be aware of the potential for venous gas embolism when AEC is in use;
2. surgeons who use AEC should select an argon flow rate as low as feasible to clear a bleeding tissue surface of blood and debris;
3. as in any situation at risk for venous gas embolism, it is probably safer to avoid using N₂O when extensive use of AEC is planned.

Francis Veyckemans, M.D.
Ives Michel, M.D.
 Department of Anesthesiology
 Cliniques Universitaires, St Luc
 Avenue Hippocrate 10-1821
 1200 Brussels, Belgium

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