Lessons Learned from Some Priority Disputes in the History of Psychology (e.g. Pavlov v. Twitmyer) and in Related Disciplines (e.g. History of Medicine)

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The Importance of Recognizing Priority

""There is strong motivation for the establishment of priority; it is considered as rewarding to the scientist(s) credited with it because discovery is crucial to science. Indeed priority has been called the "central focus of science" (Brannigan, 1981).""
(Windholz & Lamal, (1993, p. 339)

"People in general and scholars in particular bestow considerable esteem upon those whose discoveries, inventions, theories, or methods fundamentally change scholarship, research, or the worlds in which we live. Thus, it is very important that priority be rightfully attributed to those who deserve it. " (Thomas, 2015)

Thomas, R. K. (2016). Priority disputes in the history of psychology with special attention to the Franz-Kalischer dispute about who first combined animal training with brain extirpation to investigate brain functions. *The Psychological Record, 66,* 191-199.

Windholz, G. & Lamal, P. A. (1993). Vagaries of science: Priority, independent discovery, and the quest for recognition. *The Psychological Record, 43*, 339-350.

LESSON 1

...proving priorities is tantamount to playing Russian roulette, even when the game is entered into by experienced and knowledgeable players, who have a good idea in which chambers the bullets are loaded, for there is always the danger that some fact or prior deed, lurking in the literature, unseen, or unrecognized, or forgotten, will be discovered to ultimately shoot one dead. **(Wolfe, 2001, p. 504)**

Wolfe, R. J. (2001). *Tarnished idol: William Thomas Green Morton and the introduction of surgical anesthesia, a chronicle of the ether controversy*. San Anselmo, CA: Norman Publishing.

Who Discovered the “Conditioned Reflex”?

It is widely accepted that Ivan P. Pavlov “discovered” the **Conditioned Reflex** (his term was **Conditional Reflex**), and the most cited date is 1904 when he discussed it during his Nobel Prize address (Physiology, digestive system research).

HOWEVER . . .

Rosenzweig, M. R. (1959). Salivary conditioning before Pavlov. *American Journal of* Psychology, *72*, 628-633.

Dallenbach, K. M. (1959). Twitmyer and the conditioned response. *American Journal of Psychology, 72*, 633-638.

Coon, D. J. (1982). Eponymy, obscurity, Twitmyer, and Pavlov. *Journal of the History of the Behavioral Sciences, 18*, 255-262.

Coon: Edwin B. Twitmyer shared priority with Pavlov by reporting his discovery of the conditioned knee reflex in 1904 at a meeting of APA.

Dallenbach: Assigned priority to Twitmyer in in 1902 based on the submission of Twitmyer's dissertation at the U. of Pennsylvania.

Dallenbach and Coon: Discussed factors contributing to Twitmyer's obscurity with Coon addressing that matter in greater depth.

Several History of Psychology textbooks began to recognize Twitmyer.

Sigizmund G. Vul fson, born in today's Poland, earned a medical degree in Estonia. Then he went to Pavlov's Laboratory to earn a Ph.D. degree. In his dissertation (1898) Vul fson discovered "Psychic Reflexes."

One example among others: Vul fson exposed a dog's nose to a glass of carbon bisulphide causing the dog to turn its head away and to salivate. This was repeated several times.

"Now we substitute surreptitiously an identical glass containing water. The dog salivates again although with a smaller quantity." (Windholz, 1986, p. 142)

Windholz, G. (1986). A comparative analysis of the conditional reflex discoveries of Pavlov and Twitmyer and the birth of a paradigm. *The Pavlovian Journal of Biology, 21*, 141-147.

LESSON 1 (Wolfe's Russian roulette analogy) IS CONFIRMED.

LESSON 2: The "Matthew effect"

Coon's (1982, p. 259) " . . . **S. G. Wolfson** [among others] **. . . quickly and enthusiastically embraced** [Pavlov's] **the discovery** [of the conditioned reflex] **and its implications for the study of the central nervous system."**

Merton, R. K. (1968). The Matthew effect in science. *Science, 159, 56-63.*

Merton (1968) quoted Matthew 26:29 from the *King James Bible.*

For unto everyone that hath shall be given and he shall have abundance [Pavlov] ; But from him that hath not shall be taken away even that which he hath [Vul fson].

The Franz-Kalischer Dispute Over who First Combined Animal Training and Brain Extirpation to Study Brain Functions

Franz, S. I. (1902). On the functions of the cerebrum: I. The frontal lobes in relation to the production and retention of simple sensory-motor habits. A*merican Journal of Physiology, 8*, 1-22

Franz, S. I. (1906). Observations of the functions of the association areas (cerebrum) in monkeys. *Journal of the American Medial Association, 47*, 1464-1467.

Franz, S. I. (1907). On the functions of the cerebrum: The frontal lobes. In R. S. Woodworth (Ed.), *Archives of Psychology* (pp. 1-64) New York, NY: The Science Press.

In his autobiographical chapter (1932) and after reporting commendations from Sir Charles Sherrington and Sir Edward A. Shapey-Shafer for his new method, Franz continued:

A further and much later commendation came in a less pleasant fashion. This was the appearance of an article by Kalischer in which he appropriated the training-extirpation method as his own. . . . . To this I protested because I could see no reason why the method, if of any worth, should be labeled "made in Berlin." Kalischer's article was, however, as complimentary as is all plagiarism. (Franz, 1932, p. 96)

Franz, S. I. (1907). Über die Dressurmethode für Zentralnervensystems-untersuchungen. [About the so-called training method for the study of the central nervous system.] *Zentralblatt für Physiologie, XXL*, 583-584.

Kalischer, O. (1907). Einige bemerkungen über meine dressurmethode. [Some comments about my training method.] *Zentralblatt für Physiologie, XXL*, 585-586.

Both titles and articles translated by George Windholz (1932-2002) at my request in 1995.

Regarding their dispute, Kalischer's most salient point was his assertion that others had preceded both him and Franz. He identified two researchers and briefly described their observations (presumably, but not conclusively, experiments), but he cited no References.

Franz did not respond directly to Kalischer's two examples, but he had cited three similar ones in the 1907 monograph and he had discussed why they were not comparable to his "special method."

Franz (1902) clearly preceded Kalischer (1907).

However, both claims were described vaguely. For example, Franz used the phrase “special method” to contrast his method with previous studies that had involved animal learning or memory and experimental brain damage. Both Franz and Kalischer let their methods “speak for themselves” rather than providing precise accounts of why their methods were unprecedented.

LESSON 3: To assess a priority claim properly, it must be sufficiently well described. Nevertheless, those who assign credit for priority in this case assign it to Franz, rightfully so in my view.

Might Wolfe's Russian roulette someday defeat Franz's priority claim? Details of Franz's "special method" make it unlikely. His method included:

1. Using multiple learning tasks so that findings were not task dependent. 2. Describing his surgical methods carefully to maximize replication. 3. Presenting brain diagrams to show location and surface extent of extirpations. 4. Extirpating different brain areas to assess area/function relationships. 5. Extirpating some animals before training to asses effects on learning, and extirpating other animals after training to assess effects on memory. 6. Showing that only bilateral lesions affected learning and memory. 7. Showing that extirpated animals with memory loss could relearn and that following a second extirpation with memory loss, the animal could again relearn.

The latter influenced Franz's view of rehabilitation in humans.

Franz, S. I. (1923). Nervous and mental re-education. New York, NY: Macmillan Company.

In aggregate, his findings led to his theoretical anti-localization view for "higher-order learning," a position expressed in "New Phrenology," his SSPP presidential address in 1912.

Franz, S. I. (1912). New Phrenology. Science,

THE CONTROVERSIAL DISCOVERY OF ANESTHETIC ETHER FOR SURGERY

In the Barkley Symposium (2001), I described how Crawford W. Long, in Jefferson, GA on March 30, 1842 (not published until 1849) was the first to use anesthetic ether for surgery. Long was severely criticized and largely denied priority credit in medical historical literature due to his delay in publication . Long described three good reasons for his delay.

- Long suspected the anesthetic effects might be due to some kind of patient-self induced **mesmerism** , and he wanted controls for that.

- After reading in 1846 about William Thomas Green Morton's claim for discovering anesthetic ether, **Long decided to wait to see if claims earlier than his would be forthcoming**.

- **It took several years in his small country practice to accumulate the control cases he felt he need to exclude mesmerism . Most relevant:**

- He amputated two fingers from a patient's hand, one with and one with benefit of ether. Only ether prevented pain. (1843)

- He excised three cysts from the head of a patient, and he used ether only for the 2nd excision. Only ether prevented pain. (1845)

Shenanigans & Politics Associated with the Discovery of Anesthetic Ether

Wolfe, R. J. (2001). ***Tarnished idol: William Thomas Green Morton and the introduction of surgical anesthesia, a chronicle of the ether controversy*****. San Anselmo, CA: Norman Publishing.**

1. **Morton, a dentist, served as the anesthesiologist** for neck surgery performed by Chief of Surgery, John C. Warren, on **October 16, 1846, at the Massachusetts General Hospital in Boston, MA.**

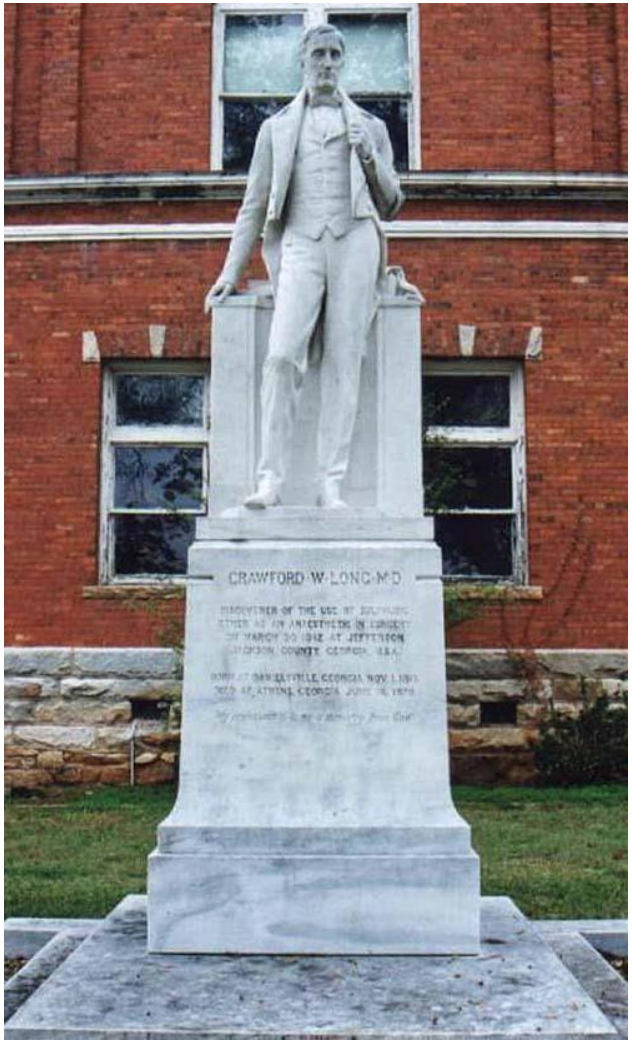
   Mass General today maintains the operating theater as a museum known as the Ether Dome, and the Mass General website clearly implies that anesthetic ether was discovered there in 1846. Elsewhere on the website, they downgrade the discovery claim and instead describe it as the "first public demonstration" of anesthetic ether.

2. **In his effort to patent ether,** a chemical well known and in the public domain, **Morton disguised it with color and aromatics and gave it the name Letheon**

3. **Morton waged a several-decades-long battle in the U. S. Congress** to receive recognition and a large monetary prize for the discovery of anesthetic ether.

Morton lost his battle with the U. S. Congress.

Long's statue was unveiled in Statuary Hall in the United States Capitol on March 20, 1926. This replica is on the Courthouse Lawn in Danielsville, GA, Long's Birthplace.



4. Boston Gardens includes a stature to commemorate Boston as the location of the discovery of anesthetic ether.

The statue has four inscriptions. One of them is

“To commemorate that the inhaling of ether causes insensibility to pain. First proved at the Mass. General Hospital in Boston, October AD MDCCCXLVI.”

Did Mass General provide the "first public demonstration" of anesthetic ether?

Desal, S. P. , et al. (2007). A tale of two paintings. *Anesthesiology, 106*, 1046-1050.

The First Operation with Ether
Robert Cutler Hinckley
Completed 1893 or 1894

Ether Day, 1846
Warren and Lucia Prosperi
Unveiled, October 16, 2001

How many persons were present at this "first public demonstration"?

Three physicians in Hinckley's painting testified before U. S. Congress in 1849 that they were not present, and others in the gallery have been proven not to have been present (http://neurosurgery.mgh.harvard.edu/History/artists.htm). Fewer are shown in the Prosperi painting. Let's say, very generously, that 50 people were present.

Painting on the Website for the Crawford W. Long Museum in Jefferson, GA

Courtesy of Crawford W. Long Museum, Jefferson, Georgia

Long produced affidavits from three witnesses to his surgery, but Sims (1877) documented the presence of six witnesses.

Sims, J. M. (1877). The discovery of anesthesia. Virginia Medical Monthly, 4, 81-99.

Interpolating between Boston's populations in 1840 and 1850, one obtains a population of 119, 482 for Boston in 1846 which indicates that 0.0004 % (50/119,482) of Boston's population witnessed the surgery at Mass General. Jefferson had a population of 9,554 in 2011, and I think a very high estimate for 1842 would be 1,373 meaning that 0.004 % (6/1,373) of Jefferson's population witnessed Long's surgery.

So, what does it mean to claim "first public demonstration"?

FINAL LESSON

It would appear that the "Matthew Effect" might apply to BIG cities like Boston and BIG hospitals like Massachusetts General versus small towns like Jefferson and a small country medical practice when it comes to the claiming to be the site of an important discovery.

I suppose Long's supporters will have to take solace where they can .

Friedman, M, & Friedland, G. W. (1998). *Medicines 10 greatest discoveries*. New Haven, CT: Yale University Press.

Chapter 5 "Crawford Long and Surgical Anesthesia"