

ACESO

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Contents

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Women in Medicine:

- 5 Educating Women Before it was the Law:
 BUSM's First Century of Female Graduates
 A'Llyn Ettien, MLIS
- 9 The New England Female Medical
 College/Vassar College Connection:
 Alida Avery and Helen Worthing-Webster
 James S. Brust, MD

Treatment:

- 16 Scurvy: In the Beginning
 Robert M. Beazley, MD FACS
- 20 The Illegal Cure
 Teng J. Peng

Features:

- 23 Dr. Daniel Drake (1785- 1852)
 Pioneer Physician to the Midwest
 Theodore W. Eversole, Ph.D.
- 30 Reflections on a Textbook of Pathology Published
 100 Years Ago and its Author Frank Burr Mallory
 Michael J. O'Brien, MD MPH



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About the Cover

Pathology building at Boston City Hospital

This building was built in 1896, and was located on the corner of Albany Street and Massachusetts Avenue. Dr. Frank Burr Mallory, a famous American pathologist who, among many contributions, had discovered Mallory bodies, worked in this building at Boston City Hospital. Over three decades later, a new pathology building, named Mallory Institute of Pathology, was built in honor of Dr. Mallory. The first pathology building is now replaced by Menino Pavilion and Dowling Building. As you flip through this journal, you will notice that it concludes with an article focusing on Dr. Frank Burr Mallory and his works.

JOIN THE ACESO STAFF

Interested in getting involved with *Aceso*? We are actively looking for new Editors and Graphic Designers to join our staff. We are recruiting for this upcoming semester so spread the word!

Editors take part in shaping the overall direction of *Aceso* and review the articles submitted by our writers. This position requires the staff member to have excellent writing skills.

Design Editors and graphic designers create the cover, layout the format, and manage the artwork of *Aceso*. This position requires either some art or design experience.

If you are interested in applying for one of these positions, please email us at aceso@bu.edu and let us know what position you are applying for.



About Aceso

This journal is named for a Greek goddess, Aceso, the daughter of Asclepius and sister of Panacea. Her name comes from the Greek word *akéomai*, which means "to heal." She represented the act of the healing process itself. Unlike the other gods, she personifies medicine from the patient's side, a process that involved both the ill and the

physician. Rather than a magic cure-all offered by Panacea, Aceso offered a more holistic approach to health care, understanding that the path to wellness takes time and effort.

Letter from the Editor

The Things We Take Away:

It is my pleasure to introduce the third edition of *Aceso: Journal of the Boston University School of Medicine Historical Society*. As the new editor-in-chief, I had the pleasure of witnessing this edition evolve from a blank canvas to a layout comprised of articles with topics ranging from commemorating physician pioneers and celebrating female figures influencing the field of medicine to exploring how treatment discoveries have been implemented.

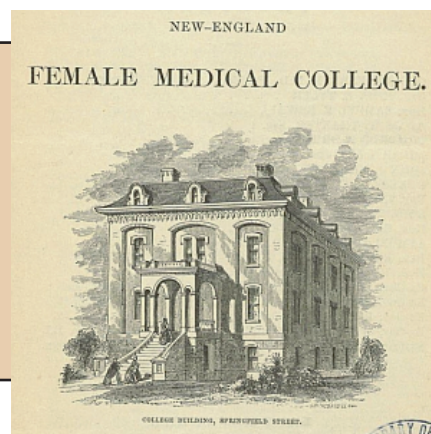
Boston University School of Medicine Historical Society is a student group that provides four to six talks every year on the history of medicine. These events cultivate opportunities where individuals can appreciate and contemplate on the past, and perhaps even become fascinated by the advancement of medicine. In addition

to these events, Aceso was created to further provide historical perspective on modern medicine. It is a medium where both writers and readers witness the marriage of humanities and science. It, once again, allows us to step away from our fast-paced lives, and reflect on the past. Aceso accepts contributions from students, staff members, professors and physicians across all departments (school of public health and medicine, graduate programs, and undergraduate campus) from Boston University and other academic institutions. I sincerely hope you will enjoy this publication!

Hanae Fujii-Rios, MPH
BUSM Class of 2016

About the Art

Unless noted, pictures throughout this issue are from the archives of the Alumni Medical Library of Boston University School of Medicine. Special thanks to A'Llyn Ettien for allowing us to access the archives.



Women In Medicine

Educating Women Before it was the Law: BUSM's First Century of Female Graduates

A'Llyn Ettien, MLIS
Head of Technical Services
Boston University Alumni Medical Library

The Medical Library archive occasionally receives questions regarding the number of women in early classes at Boston University School of Medicine (BUSM). BUSM claims a proud place among the first coeducational medical schools in the United States, and this position owes much to its predecessor institution, the New England Female Medical College (NEFMC). One of the first female medical schools in the world, the NEFMC operated from 1848-1873 before merging with Boston University to become the Boston University School of Medicine.

The newly formed BUSM accepted men, which was certainly a wise decision for a new school aspiring to play a meaningful role in the U.S. medical education, given

that men would have made up a much larger percentage of medical school applicants at the time. However, BUSM also continued to educate women, sometimes in significant numbers, while many other medical schools remained entirely closed to women until much later, and often continued to accept only rare female students until the passage of Title IX in 1972. Title IX, which made sex discrimination illegal for schools accepting federal funding, is widely credited with opening professional schools to women, and coming roughly a century after BUSM's foundation, it served as a convenient end-point for this quick study.

Determining the number of women in early BUSM classes is an inexact process, since the archives do not contain lists explicitly broken down by sex. However, it is

possible to see the names of each year's graduates and to recognize most personal names as traditionally either male or female. Newspaper articles, obituaries, or other online references can sometimes help clarify a 'questionable' name. The table below, with numbers for BUSM classes from 1874 to 1975, should therefore be at least nearly accurate, though an occasional misclassification is possible.

The time period examined was chosen to provide a sketch of female education at BUSM before it was required by law. The class of 1975, beginning their education in 1971, would be the last class admitted before Title IX opened medical schools in general to women: the progress of women at BUSM after Title IX could be another story.



The table below shows the total number of graduates in each year (Grads), the number of graduates who were female (F) and male (M), and the percentage of the class that was female (%F).

Year	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886
Grads	5	30	31	45	43	35	35	26	29	30	34	26	18
F	1	7	8	18	15	10	16	8	14	10	18	14	10
M	4	23	23	27	28	25	19	18	15	20	16	12	8
% F	20	23.3	25.8	40	34.8	28.5	45.7	30.7	48.2	33.3	52.9	53.8	55.5
Year	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899
Grads	28	35	29	27	27	24	41	15	32	33	30	46	44
F	10	12	9	7	10	8	19	6	9	14	14	15	11
M	18	23	20	20	17	16	22	9	23	19	16	31	33
% F	35.7	34.2	31	25.9	37	33.3	46.3	40	28.1	42.4	46.6	32.6	25
Year	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912
Grads	35	24	23	36	27	14	23	13	19	18	14	17	18
F	8	7	7	14	5	2	4	5	7	3	5	7	6
M	27	17	16	22	22	12	19	8	12	15	9	10	12
% F	22.8	29.1	30.4	38.8	18.5	14.2	17.3	38.4	36.8	16.6	35.7	41.1	33.3
Year	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
Grads	11	22	21	18	24	16	12	12	14	23	25	46	49
F	2	4	6	6	3	3	1	4	4	2	4	2	10
M	9	18	15	12	21	13	11	8	10	21	21	44	39
% F	18.1	18.1	28.5	33.3	12.5	18.7	8.3	33.3	28.5	8.6	16	4.3	20.4
Year	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938
Grads	49	47	41	49	47	47	52	53	53	56	64	54	45
F	4	3	2	10	4	3	5	6	2	4	6	3	5
M	45	44	39	39	43	44	47	47	51	52	58	51	40
% F	8.1	6.3	4.8	20.4	8.5	6.3	9.6	11.3	3.7	7.1	9.3	5.5	11.1
Year	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Grads	48	54	34	51	90	50	64	61	58	55	51	56	57
F	0	9	6	4	12	5	4	1	3	3	9	7	2
M	48	45	28	47	78	45	60	60	55	52	42	49	55
% F	0	16.6	17.6	7.8	13.3	10	6.2	1.6	5.1	5.4	17.6	12.5	3.5
Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Grads	70	71	65	76	70	69	56	66	72	62	69	74	65
F	6	5	4	5	3	2	7	7	6	5	6	9	10
M	64	66	61	71	67	67	49	59	66	57	63	65	55
% F	8.5	7	6.1	6.5	4.2	2.8	12.5	10.6	8.3	8	8.6	12.1	15.3
Year	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975		
Grads	67	74	62	77	70	66	79	93	93	101	106		
F	10	7	13	11	12	6	12	12	17	18	20		
M	57	67	49	66	58	60	67	81	76	83	86		
% F	14.9	9.4	20.9	14.2	17.1	9	15.1	12.9	18.2	17.8	18.8		

As can be seen, the number of women receiving MD degrees from BUSM varied widely over the years, from as many as nineteen or twenty (1893, 1975) to as few as one (1874, 1919, 1946). The school did consistently honor its foundational commitment to educate women as well as men, and only one year (1939) shows no female graduates. In all, 759 women graduated from BUSM in these 102 years, by this count.

Perhaps as interesting as pure numbers are the percentages of women in each class. As seen in Figure 1, this was often quite high in the early years of the school. BUSM was in fact greater than 50% female from 1884-1886, and classes did not drop below 20% female until 1904, 30 years after the school was founded.

Both raw numbers and percentages varied greatly from year to year, suggesting that there was no set quota in place, at least in the early years, and that the school may have accepted students with little or no regard to gender. The picture changes in the early 20th century, perhaps as a result of a new focus from the administration.

The second line (class size) on Figure 1 should be interpreted with caution since the two lines measure quite different things, but it is interesting to note that peaks on the 'percentage female' line frequently correlate with dips on the 'class size' line: that is, classes that were significantly female also tended to be small. Obviously, a

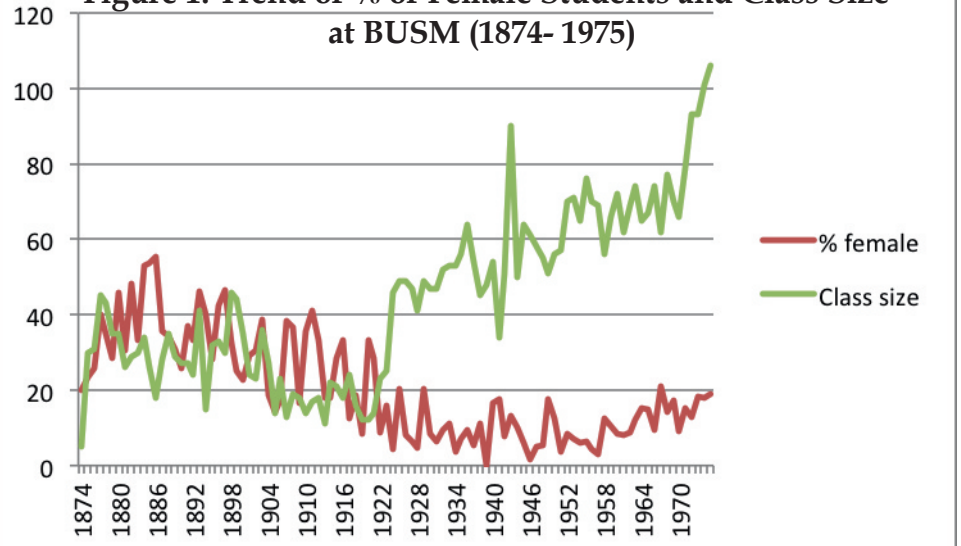
single student can make up a large percentage of a tiny class (as did the one woman who was 20% of the inaugural 5-person class of 1874), so this is not surprising.

Between 1916 and 1920 we see an interesting divergence in the two lines: class sizes increase

actual numbers of women and men, also shows this pattern, with the two lines roughly tracking until that point in 1924 when the number of men begins to really climb, while the number of women holds (more or less) steadily.

This pattern may suggest

Figure 1: Trend of % of Female Students and Class Size at BUSM (1874- 1975)



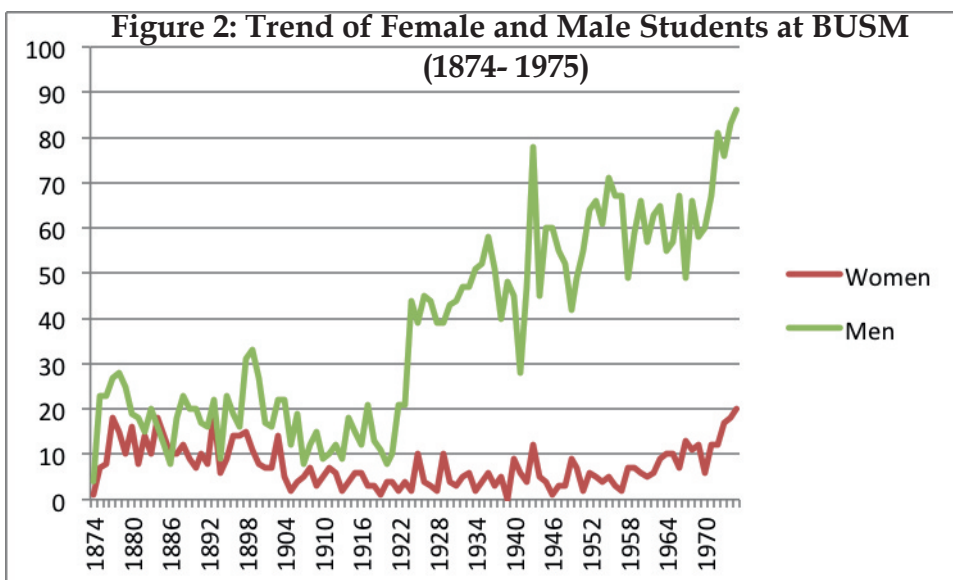
dramatically, but the percentage of each class that is female drops and thereafter hovers near or well below 20 for the rest of the examined time period.

We might roughly summarize this data by saying that women were a fairly stable proportion of classes until the early 1920s, when class sizes increased with an influx of male students, causing women as a percentage of the graduating classes to fall significantly and remain low thereafter. Figure 2, comparing the

that BUSM was to some extent perceived as a 'female' school in its early years, when class sizes overall were small and the percentage of women was quite high, but that as it gained in popularity (and the memory of the NEFMC faded), its reputation became more mainstream and it attracted and enrolled more male students. Based solely on this data, it is impossible to say whether conscious efforts were ever made to actively limit the number of women in each class. However, given the generally unfavorable societal attitude toward female physicians in the early 1900s, it may have been a welcome development for the school to be able to accept increasing numbers of male students, and as a result to present itself as a more traditional, mainly male, institution.

An interesting note is that the largest increase in (male) students occurs shortly after the school switched from its early, homeopathic curriculum to a more standard 'non-sectarian' one in 1918: from 25 students in 1923, we see a jump to 46 in 1924, and class size never drops below 30

Figure 2: Trend of Female and Male Students at BUSM (1874- 1975)



again (and then only for one year). It seems possible that the homeopathic curriculum may have served as a deterrent to some students, especially in the wake of the 1910 Flexner Report and the related reform of medical education during this period. If this is true, once word spread that the curriculum had become more in line with standard practice, these students may have begun applying to BUSM in larger numbers.

The relationship between the school's 'homeopathic' status and its 'female' reputation is likely to be complex. Were women more drawn to homeopathy as a study, or was the curriculum simply less popular, to the extent that there was room in BUSM's classes for women who, if more options had been available to them, might have gone elsewhere? (It should be noted that a perusal of BUSM's course catalogs during its homeopathic years shows

However, we can fairly say that even if BUSM did not educate as many women as it did men in the early-to-mid 20th century, it did consistently accept them, and those who graduated still represent several more women per year than can be found in the graduating classes of many other medical schools over that time period.

all the scientific subjects we might expect to see in a medical school of the time, along with courses on homeopathy, so there is no indication that a BUSM education was less thorough than one received at another institution: however, since homeopathy was as controversial at the time as it is today, its mere presence in the required course listings may have caused some students who could get into other schools to pursue their education elsewhere.)

Whether the new, 'non-sectarian' reputation was less appealing to female students, whether an overall trend towards fewer women seeking medical education in the United States in the half-century after 1900 is responsible, or whether women continued to apply to BUSM but were less likely to be accepted when the school was able to fill classes with men, would all be interesting areas for further study. Whatever

the reason, the average number of women in each class fell beginning in the early 20th century, from 11 between 1874-1899, to 5 from 1900-1957. The average rose relatively quickly back to 10 between 1958-1975, undoubtedly reflecting social trends of the time, although, as noted, 10 women in the 1960s were a much smaller percentage of the total class than they were in the 1890s, complicating the picture somewhat.

These numbers represent a very limited overview of one aspect of women's education at BUSM, and leave a multitude of stories invisible and untold. However, we can fairly say that even if BUSM did not educate as many women as it did men in the early-to-mid 20th century, it did consistently accept them, and those who graduated still represent several more women per year than can be found in the graduating classes of many other medical schools over that time period. The significance of the school's role in the history of women's medical education in the United States cannot be dismissed, and based on these numbers, BUSM may be justifiably proud of its history of education for women.

Women In Medicine

The New England Female Medical College/Vassar College Connection: Alida Avery and Helen Worthing-Webster

James S. Brust, MD
Boston University School of Medicine
Class of 1968

James S. Brust, M.D. is a psychiatrist in private practice in San Pedro, California, and serves as Chairman of the Department of Psychiatry and Medical Director of the Psychiatric Unit at Providence Little Company of Mary Medical Center in San Pedro. He is also Assistant Clinical Professor of Psychiatry at the David Geffen School of Medicine at UCLA, and teaches psychiatric residents at the Harbor UCLA Medical Center. In addition to full time practice, Dr. Brust is an independent historian, specializing in 19th century popular prints and photographs, occasionally crossing over into medical topics including Mary Lincoln. He has written over forty-five journal articles, five book chapters, and is coauthor of the book Where Custer Fell, Photographs of the Little Bighorn Battlefield Then and Now (University of Oklahoma Press, 2005). Since 1995, Dr. Brust has been acquiring historical artifacts relating to BUSM and the Boston City Hospital and donating them to the Alumni Medical Library.

Colleges for women were all but unknown in this country when brewing magnate and educational visionary Matthew Vassar (1792-1868) established Vassar College in 1861. Instruction began in 1865, with an initial faculty of nine. Chosen as professor of Physiology and Hygiene, and Resident

Physician (in an era when women physicians were still rare), was 32 year old Alida Cornelia Avery, M.D., an 1862 graduate of the New England Female Medical College. [1]

Alida Avery was born in Sherburne, N.Y., on June 11, 1833, one of eight children of Deacon Williams Avery and his wife

Hannah. [2] Her interests turned to medicine, and she spent one year at the Philadelphia Women's Medical College (1858), then, as recipient of a Wade scholarship, attended the New England Female Medical College, where she was granted the degree of Doctor of Medicine in 1862. This was followed by an internship at the New England

Hospital for Women and Children in Boston, then periods of time practicing in Brooklyn, N.Y. and Cleveland, Ohio, before taking up her position at Vassar. [3]

During her nine years at Vassar College, Dr. Avery would create an admirable legacy as teacher, physician, and valued member of the Vassar community, serving also as secretary of the faculty and even president of their Floral Society. [4] It is well known that women faced

prejudice and disadvantages in seeking education at that time, a problem that would go on for another hundred years or more. We tend to think that arose from feelings that females were

But less remembered now is a belief widely held in that era that higher education was actually detrimental to women --- potentially damaging to their health and the ultimate fulfillment of their role in society.

not qualified for such study, or did not need it. But less remembered now is a belief widely held in that era that higher education was actually detrimental to women --- potentially damaging to their health and the ultimate fulfillment of their role in society. As one of the very first colleges for women in this nation, Vassar had to be prepared to counter these fears. From the start, Matthew Vassar emphasized physical training, nutritious diet, and a healthy rural setting on the property he had donated for the campus in Poughkeepsie, N.Y. The proper monitoring of the health and development of the young women students was an obvious concern and quite likely led to the decision to have a professor of Physiology and Hygiene who was also a physician.

So in addition to teaching and caring for the students at her school, Dr. Avery found herself in a

position to influence a national debate. She actually conducted and published a study in which she rated the health ("good," "fair," or "delicate") of each incoming student in three consecutive classes, then evaluated them all again upon their graduation four years later (the classes of 1871, 1872 and 1873). Of a total of 51 in good health, only five experienced a worsening (two because they were too young on admission). Of 28 initially rated in

fair health, 23 improved while the other five remained the same but did not worsen. And of the 15 "delicate," ten improved and the other five remained the same but also did not worsen. So in a scientific format not unfamiliar to us 140 years later, Dr. Avery actually showed that a Vassar education was far more likely to improve health than weaken it. [5]

Dr. Avery departed Vassar in the spring of 1874 and headed west to Colorado, then just a territory with statehood still two years away. She lived in Denver, where she not only practiced medicine, she took up the cause of women's suffrage. It is said that such illustrious leaders of that movement as Lucy Stone and Susan B. Anthony were guests in her home. Retiring from medical practice in early 1887 she moved even farther west, to California, settling first in San Jose, then on to San Francisco in 1901. Sadly, the catastrophic earthquake of 1906 destroyed a good deal of her personal property, and she returned to San Jose, residing with friends

there until her death on September 22, 1908. [6]

Dr. Avery was certainly a remarkable woman, and it is no surprise that Vassar was sorry to see her go. A campus publication stated: "The College will lose a faithful friend and servant in the person of Dr. Avery, who, as we understand, expects to resign her position as soon as a suitable person shall be found to take her place. She has been here ever since the opening of the College, and there can be little doubt that to her skill and her unwearied vigilance, we owe much of that exemption from illness which has always characterized the College family." [7] The historical literature on the New England Female Medical College is thin, consisting of little more than the major works by Frederick C. Waite and Martha N. Gardner (note #1). Both, though, were well aware of Alida Avery's role at Vassar College. What has gone previously unnoted, however, is that when Dr. Avery departed, the "suitable person" found to replace her was her NEFMC classmate and fellow 1862 graduate, Dr. Helen Worthing-Webster.

Helen Baker Worthing, daughter of Amos H. Worthing and his wife Laura, was born in Boston on March 24, 1837, though she grew up in New Bedford, Massachusetts. After her NEFMC graduation, she served in Union Army hospitals during the Civil War, returning to New Bedford afterward, where she practiced medicine. Dr. Worthing married William W. Webster, and the couple had one child, a daughter named Laura, born ca. 1864. [8]

We have no details on what led Dr. Worthing-Webster to Vassar. We can assume she and Alida Avery

knew one another at NEFMC, but we know nothing about their relationship there or after. It was announced at Vassar in April 1874 that Dr. Avery's official connection with the college had closed, and that she had "filled a difficult position with great ability and faithfulness... Her successor, Mrs. Helen W. Webster, is a thoroughly educated and experienced physician. She served in the army hospitals during the late war, and has since had a large and successful practice in New Bedford, Mass. The college may be congratulated upon the acquisition of one who, both by education and experience, seems eminently fitted for the duties of resident physician." [9] Though they are mentioned in the same paragraph, we are told nothing of their connection, or whether Alida Avery specifically recruited Helen Worthing-Webster, and if so, why. But regardless of the circumstances, Helen Worthing-Webster took over Alida Avery's position at Vassar in 1874, and would hold it until 1881.

Unlike Avery, Worthing-Webster was married. There is no record of her husband accompanying her, but her daughter Laura, who would grow up to be a talented musician and music teacher, joined her mother on the Vassar campus at age 11 in 1875.

Interestingly, Dr. Helen Worthing-Webster is best remembered for her support of young women playing baseball on campus. Students at Vassar College organized two baseball teams in 1866, this "with the support of a female physician who thought exercise for women essential to good health." [10] In 1866, though, Alida Avery was the campus physician and Helen Worthing-Webster had not yet arrived. Girls

playing such an active sport was not without controversy, and a decade later, baseball disappeared from the Vassar campus. By that time Helen Worthing-Webster had taken over as campus physician. A widely quoted letter from a Vassar student, which was read in the popular, Emmy winning, Ken Burns documentary *Baseball*, would attach her name to the story of baseball at Vassar: "One day a student, while running between bases, fell with an injured leg. We attended her to the infirmary, with the foreboding that this accident would end our play of baseball... Dr. Webster said that the public doubtless would condemn

the game as too violent, but if that student had hurt herself while dancing, the public would not condemn dancing to extinction." [11]

Whether it was Alida Avery who championed baseball at Vassar, Helen Worthing-Webster, or most likely both, the latter now receives the credit.

After leaving Vassar, Helen Worthing-Webster returned to New Bedford, Massachusetts where she continued medical practice at least into the mid 1890s. She died on July 19, 1904 and is buried at Rural Cemetery in New Bedford. I have been unable to gather much information on her husband, William W. Webster. She is listed as being widowed in the 1900 census, but the earlier census and city directory listings are unclear about him. The couple's daughter, Laura W. Webster, became an accomplished musician, studying in

Berlin under the famed German cellist Robert Hausmann (1852-1909). Upon her return to the United States she taught music and performed extensively. She advocated for women in the field of chamber music, and was involved with the Eichberg Quartet, the first professional women's string quartet, established by Julius Eichberg (1824-1893), founder of the Boston Conservatory. It appears that Laura Webster never married or had children. She died in Brookline, Massachusetts on June 25, 1943, at which time she would have been near 80 years old. [12]

Alida C. Avery and Helen

"One day a student, while running between bases, fell with an injured leg. We attended her to the infirmary, with the foreboding that this accident would end our play of baseball... Dr. Webster said that if that student had hurt herself while dancing, the public would not condemn dancing to extinction."

Worthing-Webster were both successful physicians and remarkable women. This article is just a brief summary of their careers and accomplishments, but it is sufficient to show the high quality of the New England Female Medical College graduates. Certainly Vassar College was aware. So highly thought of and well

remembered was Dr. Avery that in 1931, over half a century after her departure and nearly a quarter of a century after her death, a multiple use building originally built on campus in 1866 was renamed Avery Hall in her honor. [13] After just this limited look at Drs. Avery and Worthing-Webster, I would guess that research on virtually any one of the ninety-eight New England Female Medical College graduates, including further work on the two featured here, would make an interesting and worthwhile project.



FIGURE 1. Alida Avery, 1874. Courtesy of The Boston University Alumni Medical Library, gift of Dr. James Brust.



FIGURE 2. Helen Worthing-Webster, 1874. Courtesy of The Boston University Alumni Medical Library, gift of Dr. James Brust.



FIGURE 3. Page from an 1874 photo album of Vassar College faculty and students. At the upper right is the photo of Dr. Alida Avery that appears as Fig. 1 in this article, while our Fig. 2, photo of Dr. Helen Worthing-Webster, is at the lower right. On the upper left is Maria Mitchell, Professor of Astronomy, who like Alida Avery was one of the nine original Vassar faculty members in 1865. Courtesy of Dr. James Brust.



FIGURE 4. Alida Avery, 1869. Courtesy of Archives and Special Collections Library, Vassar College, 08.12.05.



FIGURE 5. Alida Avery, undated. Courtesy of Archives and Special Collections Library, Vassar College, 08.12.09.



FIGURE 6. Helen Worthing-Webster in the physician's parlor, 1877. Courtesy of Archives and Special Collections Library, Vassar College, 08.15.04.



FIGURE 7. Laura Webster, daughter of Dr. Helen Worthing-Webster, undated. Courtesy of Archives and Special Collections Library, Vassar College, 30585.



FIGURE 8. Calisthenium and Riding Academy, Vassar College, ca. 1873. In 1931, this building was renamed Avery Hall in honor of Dr. Alida Avery. Courtesy of Archives and Special Collections Library, Vassar College, 08.02.05.

Notes:

- [1] *The two major sources on the New England Female Medical College, both of which document Alida C. Avery's 1862 graduation, are: Frederick C. Waite, History of the New England Female Medical College, 1848-1874 (Boston: Boston University School of Medicine, 1950), p. 120; and Martha N. Gardner, Midwife, Doctor or Doctress? The New England Female Medical College and Women's Place in Nineteenth Century Medicine and Society (PhD dissertation, Brandeis University, 2002, Proquest, Ann Arbor, MI, UMI #3045889), p. 264.*
- [2] Obituary, "Death of Dr. Alida C. Avery," *The Sherburne [N.Y.] News*, Saturday, October 8, 1908.
- [3] Avery's receipt of a Wade scholarship and her internship at NEH are documented in Gardner, p. 264. On Wade scholarships, see Waite, pp. 49, 59, 77. Her education in Philadelphia and practice in Brooklyn and Cleveland are in the *Sherburne News* obituary.
- [4] *Vassar Miscellany*, January 1873 (no page noted).
- [5] Alida C. Avery, "Vassar College," in Anna C. Brackett (ed.), *The Education of American Girls* (New York: G.P. Putnam's Sons, 1874), pp. 346-361.
- [6] *Sherburne News* obituary, and Tom Sherlock, *Colorado's Healthcare Heritage: A Chronology of the Nineteenth and Twentieth Centuries*, Volume One, 1800-1899 (iUniverse, 2013), p. 190.
- [7] *Vassar Miscellany*, October 1873, p. 52.
- [8] Information on Helen Worthing-Webster is from Gardner, p. 263, the files of the Vassar College Library, and her death certificate accessed on Ancestry.com.
- [9] *Vassar Miscellany*, April 1874, p. 190.
- [10] Geoffrey C. Ward and Ken Burns, *Baseball, An Illustrated History* (N.Y.: Alfred A. Knopf, Inc., 1994) p. 18. This book was a companion volume to the 1994 Ken Burns documentary *Baseball*.
- [11] Ibid.
- [12] Obituary of "Miss Laura W. Webster," *Brookline, Mass., Chronicle*, July 1, 1943.
- [13] Karen Van Lengen and Lisa Reilly, *Vassar College --- Campus Guide* (Princeton Architectural Press, 2004), p. 144. The building was originally named the Calisthenium and Riding Academy, before being renamed Avery Hall in 1931. After further remodeling in the early 21st century, it became known as the Center for Drama and Film (CDF).

Treatment

Scurvy: In the Beginning

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Dr. Robert Beazley was educated at the University of Maryland completing his Surgical Residency at Maryland and the University of Edinburgh. An academic surgeon since 1970 with a major interest in surgical oncology and endocrinology, he retired from BUSM in 2004.

During his military service time, 1964-65, he served as the Medical Officer and Officer in Charge of the Amundsen-Scott South Pole Station, Antarctica. Historically, scurvy was extremely common in most polar expeditions. Yet, Beazley has never seen a case of scurvy, which raised his historical curiosity about this mysterious and ancient malady.

While scurvy had been recognized from antiquity, understanding of the basic disease mechanisms and treatment were both impaired by still prevailing ancient concepts of human disease as first promulgated by Hippocrates. His theory of the four essential humors and their role in all disease obscured observations of sporadic successes in the treatment of scurvy for hundreds of years. Treatment of scurvy became wrapped in superstition and ignorance despite empirical cures.

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The Ottoman capture of Constantinople in 1453 restricted European land access to Asia, its spices and goods, causing Mediterranean powers to search for a sea route to Asia. Shortly thereafter Atlantic and Northern European powers joined in the exploration. In 1492, the Spanish beginning with Columbus, set off to find a Western sea route to Asia while the Portuguese, having already sailed and colonized parts of the West coast of Africa, sailed South and then East with Vasco da Gama. Vasco da Gama arrived in

Mombasa in 1498 to learn from the natives that his scurvy stricken crew could be quickly cured by eating oranges, lemons and fresh vegetables. [1] Nevertheless, while returning from India he was forced to abandon and burn one of his ships, the San Rafael, because 30 of its crew had succumbed to scurvy. After 732 days and sailing 24,000 miles he returned to Portugal with only 55 of his original crew of 170, most of whom had died of scurvy. On subsequent exploratory voyages Portuguese mariners made every effort to obtain fresh

vegetables and citrus stopping as often as possible. The English and Dutch were also quick to adopt the same practices. As commerce increased, trading companies recognised the financial benefits of prevention and treatment of this lethal disease. Plantations were established on the islands of Mauritius, St. Helena and at the Cape of Good Hope to supply needed fresh fruits and vegetables.

Sir. John Lancaster was commissioned by the East India Company in 1601 to take a flotilla of four vessels to the Spice Islands. His ship, the Red Dragon, avoided scurvy while the other vessels had numerous cases because he had supplied daily lemon juice to his crew. John Woodall, surgeon for the East India Company advised in his 1617 book "The Surgion's Mate" that a good quantity of juice of lemons be sent in each ship out of England and daily dispersed by two to three spoonfuls as medicine against scurvy. [2]

By the 1630s obtaining large quantities of lemons and oranges was becoming expensive especially from Catholic Spain, which did not wish to deal with Protestant England and Holland. Also vessels landing sailors on tropical islands risked bringing back aboard contagions such as malaria, yellow fever and dysentery. Limes, which contain a quarter of the amount of Vitamin C found in lemons, scurvy grass, sauerkraut and tamarinds were substituted for the "proven" lemons and oranges as preventatives and therapy. Within a few years the old remedies were replaced and forgotten.

Navies were established to protect both national and trading interests consisting of large vessels, capable of extended sea voyages, manned by hundreds of seamen; once again scurvy became the common "sea disease". Many times crews were made up of "pressed" seaman who frequently were old, unhealthy and very often on the edge of coming down with scurvy. Navy cooks used kettles made of copper metal, which is now known to rapidly degrade Vitamin C on contact. It was impossible to supply enough fresh vegetables and fruits

for long cruises. While thousands of sailors died of scurvy, it was extremely difficult to estimate the number of ships lost in battle or bad weather due to crews who were impaired or too ill to perform at their highest level because of subclinical (scorbutic taint) or early scurvy. It would not be until the end of the 18th Century that the impact of such factors would be seriously considered by the Admiralty.

In 1746 James Lind, a Scottish naval surgeon, serving aboard HMS Salisbury, a fourth rate man of war with a crew of 350 seaman, experienced a serious outbreak of scurvy while cruising the English Channel. The following year during a repeat outbreak, Lind performed a "clinical trial" employing 12 stricken seamen comparing generally accepted therapies of that era for 14 days as follows:

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25 drops of elixir of Vitrol (sulfuric acid mixed with alcohol), three times a day, for 2 patients

2 spoons full of vinegar, three times a day for 2 patients

2.5 pints of seawater, for 2 patients

2 oranges and one lemon daily x 6 days, 2 patients

Electuary paste (medicinal paste made of mustard seed, garlic, balsam Peru, dried radish root, gum, myrrh). Additionally barley water, acidulated with tamarinds, and on several occasions, cream of tartar (potassium hydrogen tartrate (a mild laxative), for 2 patients

1 quart of cider per day, for 2 patients

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Two patients only received 6 days of citrus because the supply was exhausted. However, at the end of only six days, both of the "citrus patients" were sufficiently recovered to resume their duties or to nurse the others. Lind concluded

Limes, which contain a quarter of the amount of Vitamin C found in lemons, scurvy grass, sauerkraut and tamarinds were substituted for the "proven" lemons and oranges as preventatives and therapy. Within a few years the old remedies were replaced and forgotten.

"that oranges and lemons were the most effectual remedies for this distemper at sea". [3]

Lind published the first of his three editions of "A Treatise on the Scurvy" in 1753, dedicated to Anson, First Lord of the Admiralty, [4] in which he extensively

reviewed the very early medical literature on scurvy and discussed his "experiment" while aboard HMS Suffolk.

In January of 1740, during the War with Spain, Commodore George Anson was assigned to proceed to the west coast of South America and Central America, "to annoy and distress" Spanish

ships and coastal settlements and to capture a Spanish galleon, which annually travelled from Acapulco carrying silver to the Philippines and returned carrying spices, silks etc;

Anson commanded eight ships carrying 1,955 men. No lemons or oranges were carried as the feeling of the day was that they caused enteritis and the flotilla was cautioned not to allow men to eat fruits encountered along the route since they were felt to be a common cause of fevers and obstruction of vital organs. This voyage would become one of the most extraordinary stories in English naval history.

The flotilla managed to round Cape Horn in April with a superior force of Spanish vessels in close pursuit. Once in the Pacific, Anson encountered heavy storms and lost 200 men from scurvy but the Spanish flotilla floundered rounding the Horn and lost most of their ships. Anson was left with only two ships, which he could barely man and had to seek shelter at San Fernandez Island to obtain fresh foods and make repairs for several months. Unfortunately Anson and his remaining vessels, the Centurion and the Gloucester missed intercepting the prized Spanish galleon and in April 1742

set off westward across the Pacific. In early August Anson had to order the Gloucester scuttled because of heavy storm damage and a desperate shortage of personnel. Weeks later, Anson landed on Tinian Island in the Mariana chain. (Both atomic raids on Japan were launched from Tinian Island, August 1945). Once again Anson repaired the battered Centurion and revived his crew using local fresh vegetables, lemons and oranges. An officer on the Centurion prophetically wrote in his diary, "This distemper...expresses itself in such dreadful symptoms as are scarce credible...Nor can all the physicians, with all their materia medica, find a remedy for it...but I could plainly observe that there is a Je ne sais quoi [certain unknown 'something'] in the frame of the human system that cannot be renewed...without the assistance of certain earthy particles, or in plain English, the land is man's proper element, and vegetables and fruit his only physic".[5]

Anson intercepted and captured the Spanish silver galleon, Covadonga, on June 20, 1743 and sold her in Canton. A year later Anson landed in England, a single ship remaining of his flotilla, with the prize cargo, and only 188 of his original crew of 1,955, the majority having succumbed to scurvy. England was rudely awakened to the price scurvy extracted from its seamen and its Royal Navy.

For many years after publishing his "Treatise" Lind attempted to perfect a concentrated form of lemon juice, which could be easily stored aboard ship and remain effective for a long time. He developed what he called a "Rob" (fruit syrup), which he made by warming a large volume of lemon juice until it thickened and significantly decreased in volume. He never truly tested the effectiveness of the Rob and many who used it reported inconsistent results. We know now that elevated temperature and long exposure to

air significantly reduced its effectiveness. Also, it was not appreciated that the copper in the utensils or piping had a serious degrading effect. Anson appointed Lind as the Physician to Royal Naval Hospital at Haslar (largest Naval hospital in world) in 1758, a position he held until retirement in 1783. Although he cared daily for 300-400 scurvy patients no further clinical trials appeared and his "rob" was not accepted by the Admiralty.

Captain James Cook commanded a scientific expedition to the South Pacific to observe the transit of Venus across the Sun's disc, predicted for June 1769, following which he was to explore the general region. Along on the Endeavor was Joseph Banks the English Botanist. Additionally, Cook was to make observations on scurvy prevention. The ship carried

a variety of then popular antiscorbutics, including the then popular, wort of malt, sauerkraut, vinegar, cider, portable soup, orange juice, lemon juice, molasses and vegetables, which they attempted to get fresh as frequently as possible. The cruise experienced very little scurvy. Dr. Banks did

record that he detected some gum swelling and promptly added lemon juice in brandy to his usual evening pint of wort of malt with rapid resolution of the symptom. Unfortunately, his diary was not printed until 1896. Overall, the results were mixed and not definitive but leaned toward the wort of malt as the most effective antiscorbutic (contains no Vitamin C). The fact that essentially no scurvy occurred on such a long cruise was impressive and while it stirred some optimism in the Admiralty Cook's voyage, it "delayed rather than hastened the introduction of the best available cure for scurvy". [6]

Dr. Gilbert Blane, a Scottish physician from a well to do family, helped by a friend obtained a position as personal physician to Admiral Sir George Rodney during a deployment to the West Indies in

1780. Without previous Naval experience he studied hard reading many books including the reports of Cook's voyages and Lind's Treatise. Appalled by the seamen's state of health and their living conditions he immediately began to collect monthly statistics from all ships in the fleet on diseases and deaths in each the ship's company. Soon he had information reflecting seasonal fluctuation of diseases and death rates finding that scurvy rates doubled in Winter and early Spring dropping by June and that more fevers occurred during the hurricane season. He determined the death rate was one in seven and that scurvy out numbered all other diseases combined. In the first year Blane documented that of the 1,518 deaths only 60 were as a result of enemy action.

Based on his research Blane presented a report to the Admiralty. His plea for citrus was denied based on the results of the Cook expedition in citrus which was felt to be ineffectual. As a result of his very close relations (both professional and social) with Admiral Rodney, he got full support to institute daily rations of lemons, oranges and limes on all of the West Indies fleet as well improving the living conditions and hygiene as previously recommended in Lind's publications. The Fleet death rate dropped to one in twenty. The overall health improvement was a major factor in the staggering defeat of the French Fleet at the Battle of Saints, near St. Lucia, in April 1782. This decisive victory allowed the British to retain their West Indies possessions at the Treaty of Paris ending the American Revolution.

Blane returned to London, opened a private practice, affiliated with the St. Thomas Hospital and ultimately became the physician to a number of wealthy and socially elite patients. He published a book entitled "Observations on Diseases Incident to Seamen" in which he credited Lind's work with scurvy. In 1793 France and Britain went to war and Blane advised his friend Sir Alan Gardener to ask the Admiralty for a supply of lemon juice before departing for the West Indies. Blane was appointed to the Navy's

In 1795, only a year after Lind's death and 48 years after his experiment on HMS Salisbury, the Admiralty decided to provide lemon juice aboard a vessel if "requested".

Sick and Hurt Board, which he used as a platform from which to push his citrus agenda especially in light of Admiral Rainer's 19 week cruise in the HMS Suffolk. (Rainer replaced Gardner at the last moment). The crew received daily lemon juice in their grog and no seaman was lost to scurvy.

In 1795, only a year after Lind's death and 48 years after his experiment on HMS Salisbury, the Admiralty decided to provide lemon juice aboard a vessel if "requested". Dr. Thomas Trotter, Physician to the Channel Fleet and like Blane, a disciple of Lind, was instrumental in getting citrus "on demand" and between March and June, 3,000 cases of scurvy were cured at sea. In 1796, citrus was finally supplied to all Royal Navy blockading fleets. Blane was knighted in 1812 and today is regarded as the father of Naval Medical Science. "Without Blane's popularity with Admiral Rodney and the ruler's of the King's Navy, the country might have had to wait even more than forty years to see Lind's recommendations for preserving the health of seamen put into force". [7]

Historians theorize on the shape of the world had Britain not accepted and implemented scurvy prophylaxis during the Napoleonic Wars. On the other hand, what if all the warring powers had adopted

effective scurvy prevention at the same time? The cure was empirically recognized in the 17th century, lost in the 18th, and rediscovered at the start of the 19th still no one understood the cause of this terrible killer, what would the future hold?

Notes:

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Treatment

The Illegal Cure

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Imagine waking up in the middle of the night with an unbearable urge to wash your hands. You try to go back to sleep, but you begin to feel anxious and uneasy. No matter how hard you try, you cannot stop thinking that your hands might be dirty: Did I wash my hands before climbing to bed? What if I accidentally touched the floor while I was sleeping? Reluctantly, you go to the bathroom to wash your hands, and then you wash your hands again just in case they are still dirty. And then you decide to wash your bed sheets and vacuum the floor. The morning comes and you begin to cry out of misery and exhaustion. You wish you could be free...

It has been four years since you were first diagnosed with Obsessive Compulsive Disorder (OCD) – a mental disease that is caused by cycles of invasive thoughts and ritualistic behaviors –

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and ever since, you have tried a number of different medications and faithfully gone to all your therapy sessions. You feel like your OCD symptoms have gotten better, but you are still enslaved by your disease. You cannot maintain a long-term job, you are unable to build meaningful relationships, and you spend an incredible amount of time obsessing and acting out compulsions. However, you know that there is a safe psychosurgical procedure that could permanently subdue your OCD symptoms. But despite being performed 20,000 times per year on patients with Parkinson's disease, the FDA currently does not approve its use on patients with OCD.

Why?
A lack of clinical trials fueled by our inability to forget the past.

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The modern field of psychosurgery began on September 13 of 1848. On that fated

Wednesday afternoon, railroad foreman Phineas Gage, 25, was using a tamping iron to pack explosive powder into a hole. The powder accidentally detonated and the blast sent the tamping rod –43 inches long, 1.25 inches in diameter [1]– straight into Gage's left cheek and out through his skull. The tamping rod pierced through Gage's frontal lobe and forever changed the field of psychology, neurology, and psychosurgery.

Gage survived. And despite losing part of his frontal lobe, the records say that Gage returned to his old job a month after the accident. Everything was almost back to normal, except that to his friends and family, "Gage was no longer Gage." [2] After the accident, Gage –once an intelligent and upstanding citizen – had a hard time following plans, became violent and short-tempered, and showed "little deference for his fellows." He became living proof

that by physically altering the mind, one could alter the being.

Fueled by the findings from patient Phineas Gage, research on neuronal circuits and psychiatric disorders rapidly advanced the field of psychosurgery. This research culminated with the 1949 Nobel Prize in Physiology or Medicine being awarded to Dr. Egas Moniz [3], for his experiments on using prefrontal lobotomies to treat psychosis. Due to the lack of effective treatments for psychological disorders and the overcrowding of asylums, the medical community quickly embraced psychosurgery.

Economists at the time predicted that by performing lobotomies Americans could save \$1 million per day in taxes used to fund psychiatric institutions – in today's currency, this would translate into \$30 billion of savings per year. [4] Sadly, the hype did not live up to the expectations.

Shortly after Dr. Moniz received his Nobel Prize, tens of thousands of psychosurgical procedures were performed throughout the world. Some of the results applauded psychosurgery as the Holy Grail treatment of psychiatric illnesses, but most others turned out to be disastrous. A study by Tooth and Newton – which analyzed 10,365 patients who received prefrontal lobotomies – found that if the procedure was performed correctly, there was a 70% improvement of symptoms. [5] However, most of psychosurgeries were done under poor supervision and in old-fashioned asylums, which gave rise to a lot of deaths and a lot of horror stories.

Needless to say, many of these procedures were also

performed without the appropriate consent or for the wrong reasons. Doctors began to use psychosurgery not only to treat mental illnesses, but also to quiet down patients that were moody or difficult to handle. In one particular instance, the University of Edinburgh did a research study where they performed amygdalotomies – surgical removal of the amygdala – on children that were hyperactive or had poor concentration, in an attempt to make them more obedient. [6]

The horrors of the unregulated procedures eventually caught the attention of the media, whom began to portray psychosurgery as something inhumane and diabolical. By the early 1970's, psychosurgeries were rarely performed – in part due to the defamation of the procedure, but also due to the public outcry regarding human rights. People began to fear that psychosurgery could be used as a means of controlling people, and began to question the ethics behind the procedure. In response, stringent federal regulations were put into place. [7]

Psychosurgeries were soon replaced with pharmaceutical interventions, which proved to be relatively effective and with minimal risks. However, not all patients and not all psychological conditions can be successfully treated with drugs. According to the National Institute of Mental Health, only 50% of patients with severe psychiatric disorders –such as OCD and depression– respond to some kind of pharmacologic or psychotherapeutic intervention. [8] Those that do not respond to drugs

spend years trying different medications, switching psychiatrists, and struggling to keep their life afloat.

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For patients with OCD, Deep Brain Stimulation (DBS) offers the possibility of a cure, but under current federal regulations, it is strictly –and perhaps unfairly– regulated. [9] Deep Brain Stimulation involves the implantation of small electrodes into certain areas of the brain in order to correct for a particular disorder. The procedure has been successfully tested for the treatment of Parkinson's disease and a number of other neurological and psychological conditions. However, DBS is currently used only for patients with Parkinson's disease.

Different regulations govern the use of DBS for different diseases. For a patient with Parkinson's disease, deep brain stimulation is medically labeled as an approved 'neurosurgical' intervention, which legally allows the patient to get an electrode implant within days of diagnosis. For a patient with OCD or depression, the DBS procedure is medically labeled as a 'psychosurgical' intervention, and is only used as a 'last resort' treatment –when all other kinds of treatments have failed.

To reach this last resort, the psychiatric patient has to tolerate years of ineffective treatment and then undergo a long, stressful, and humiliating review process to obtain FDA approval. Why should consenting a patient with a disorder labeled as 'psychiatric' be different from one labeled as 'neurological'?

This situation is similar in Australia where it is legal to use deep brain stimulation for 'neurological' disorders but not for 'psychiatric' disorders. [10] In Australia, despite the fact that Tourette's syndrome is often associated with OCD, Tourette's is considered a 'neurological' disorder while OCD is considered a 'psychological' disorder. Therefore, an Australian with both Tourette's syndrome and OCD, could receive DBS surgery for his or her tics but not for his or her obsessions.

The procedures for neurosurgery and psychosurgery are almost exactly the same; with the exception that neurosurgery is used to treat 'neurological' abnormalities while psychosurgery is used to treat 'psychological' illness. Both procedures have been shown to be relatively safe and effective. But due to their historical stigma, psychosurgical procedures are currently used as a 'last resort' treatment for mental diseases. However, because there are so many medications and therapies available to treat each psychological disorder, it might take years to get to this 'last resort.' Meanwhile, patients struggle with their life, their disease, and their medical bills.



Notes:

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Feature

Dr. Daniel Drake (1785-1852):

Pioneer Physician to the Midwest

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Dr. Theodore Eversole is currently an Adjunct Assistant Professor of History at Northern Kentucky University and the University of Cincinnati. Originally from Cincinnati, Dr. Eversole received his BA, MA, and PhD from the University of Cincinnati in 1976. He went on to serve as an Assistant Archivist on the Albert Sabin Archives. Ultimately, his teaching career unfolded in England where he spent 30 years, retiring as Assistant Principal of Ivybridge Community College in Devon. After leaving Devon, he returned with his wife, Trish, to Cincinnati where he continues to teach.

Daniel Drake M.D. has long been identified as one of America's most prominent early nineteenth century physicians and educators. His scientific achievements were of a national character as were his contributions to nineteenth century medical education and practice. As historian Henry D. Shapiro concluded, "Daniel Drake's career had an order and logic of its own, generated by his personal engagement with the problems of science and society in America and

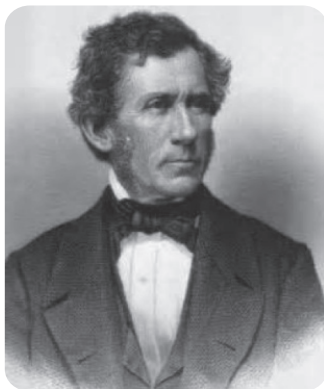
by the dynamics of his private attempts to deal with these problems as public issues." [1]

The Bicentennial of Drake's birth occurred in 1985, which nearly coincided with Cincinnati's own 1988 Bicentennial, the city that would become most closely associated with his fame and reputation. Drake, born on October 20, 1785, migrated with his family from Essex County, New Jersey, and thus his arrival in the emerging Kentucky and Ohio frontier made him part of the pioneer exodus then settling west of the Alleghenies.

Rising from a humble existence, Drake's later life would see him become a pivotal figure in Cincinnati and Kentucky's social, medical, scientific, and political development. As James Thomas Flexner declared, "Nurtured in ignorance and poverty [Drake] grew up to be the greatest physician of the new west." [2] His importance in the local medical community was so legendary that the myth arose that he was the city's first physician. Though this was untrue, Drake nevertheless was the city's first medical student. The first

physician honor belonged to Dr. John Hole (1754-1813) who was deemed the area's first "professional" doctor. Hole practiced locally for nine years before moving, in 1797, to a more remote frontier location.

Cincinnati, situated on the



Dr. Daniel Drake

Ohio River opposite Newport and Covington, Kentucky, was on the very edge of what was then the Wild West. Its 1800 population was only 750 but its prospects for development were sound, and the city steadily grew reaching a population of 100,000 in 1850 at the end of Drake's life. During these years Cincinnati emerged as a major American nineteenth century metropolis. Known nationally as the "Queen City," it was a well-positioned commercial and agricultural gateway to both the west and the south. In the very early days it also served as a key military outpost that protected the Northwest Territories. This meant that pioneer Cincinnati had the additional benefit of army physician-surgeons stationed at nearby Ft. Washington on the city's riverfront. Men such as Drs. Richard Allison (1757-1816) and John Sellman (1764-1827) filled this additional medical role. [3]

Since before Drake's birth, starting in the mid-eighteenth

century, there grew calls, especially in the expanding urban areas, for increased training and regulation in the practice of medicine. In the late 1700s it was estimated that there were only 3,500 practicing physicians in all the colonies whose total population approached 3 million in 1780 and of these only 11 per cent had received any formal training. The very term doctor was fairly uncommon before the Revolution and notably few colonials could afford to attend the established anatomical schools of Paris, Leyden, London or Edinburgh.

Change came mid-eighteenth century when Benjamin Franklin and Dr. Thomas Bond created the Pennsylvania Hospital in Philadelphia which helped Philadelphia become an early hub for formal medical training. Soon thereafter University of Edinburgh educated Drs. William Shippen and John Morgan established America's first medical school, the College of Philadelphia in 1765 quickly followed by New York City's King's College (Columbia) medical school in 1767. However, the impact of the British occupation and Revolution slowed Columbia's medical education role until after 1814. Harvard and Dartmouth also created medical departments

before the end of the eighteenth century. As Abraham Flexner's 1910 article "Medical Education in America" indicated medical schools became a growth business in nineteenth century America with 26 new schools appearing between 1810 and 1840 with 47 more opening their doors between 1840

and 1876. By the end of the nineteenth century there were over 447 medical schools in the USA and Canada. [4]

In the context of Drake's time, Cincinnati would eventually have 20 medical schools with nearby Louisville possessing perhaps 11. [5] As Flexner noted "these enterprises - for the most part, they can be called schools or institutions only by courtesy - were frequently set up regardless of opportunity or need, in small towns as readily as in large, and at times, almost in the heart of the wilderness." [6] As far as curriculum was concerned "teaching was, except for a little anatomy, wholly didactic. The schools were essentially private ventures, money making in spirit and object. Income was simply divided among the lecturers". [7] It was in such a world that Daniel Drake began his search for order, but the "rivalry between the different so-called medical centers was ludicrously bitter" and "animosities" existed as schools protected profits as they strove for monopoly. [8] Daniel Drake, even

*"Nurtured in ignorance
and poverty
[Drake] grew up
to be the greatest
physician of
the new west."*

in the face of his distinguished contributions to medicine and medical education in the Ohio Valley, was personally targeted by these competitive challenges.

As "presiding officer of the faculty of the Medical College of Ohio in Cincinnati," "Drake fell victim to the jealous rivalry of his own colleagues when he had to 'put a motion for his own expulsion and (to his embarrassment) announce... a large majority in its favor.'" [9]

The rise of these institutions reflected the beginnings of more

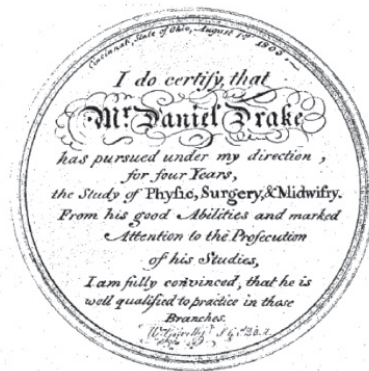
academic training but in general practice most physicians of this era of the early nineteenth century were schooled by apprenticeships, generally of short duration. Here they learned general skills and the current treatments for a variety of illnesses by working with established doctors. In the absence of public health agencies, and with the existing hospitals little more than poorhouses which could not be easily reached in a large and overwhelmingly rural society; people depended upon home remedies and natural treatments. [10]



Dr. William Goforth (1766- 1817)

Dr. William Goforth's (1766-1817) arrival in 1800 marked the beginnings of Cincinnati's substantive medical history, and it was Goforth - then the city's best known physician - who launched the career of Daniel Drake. He gave Drake the opportunity to leave his pioneer existence in the nearby river community of Mays-Lick, Kentucky and move to Cincinnati. In 1800 Drake began a four year apprenticeship in Goforth's Cincinnati office. Drake became Goforth's partner in 1804 and a few months later, Goforth issued Drake with a diploma in "Phyfic, Surgery, and Midwifry" [sic] on August 1, 1805. This educational achievement

made Drake the first physician to be so trained in the city, and his diploma represented the first



medical "degree" issued west of the Alleghenies. [11]

After completing his training, Drake went to the University of Pennsylvania for a series of lectures in the winter of 1806, at a time "when the institution was dominated by Benjamin Rush whose systematic etiology had been an almost perfect transfer to medical theory of the principles of Newtonian mechanics and the analogous sociological nominalism of Hobbes, Locke and Montesquieu." [12] He then returned to Cincinnati and set up practice in 1807. [13]

As Henry D. Shapiro observed, "Systematic observation, natural classification, and inductive generalization were never merely a matter of convenience for Drake, but the essential means by which Nature's ways might become revealed." [14] Further, the "journals, scientific and medical societies, natural history museums, libraries, academies and colleges, botanical gardens, and hospitals which he organized in his long and busy life were thus designed to serve as vehicles through which Nature's laws would be revealed." [15] This understanding became

more central to his thought after 1825 when he reflected upon the social and political basis of American development in the antebellum period. In politics, perhaps a product of his friendship with Kentucky's Henry Clay, Drake came to question the age of Jackson. Such opposition increasingly brought about an acceptance of a Whig worldview. The reason for this was that Drake saw Whiggery as scientific, for "unlike the idealism of the transcendentalists and the determinist naturalism of the laissez faire Jacksonians; it implied the knowability of the natural universe of which man was a part but with which he was not identical, and the necessity for such knowledge if man was to be more than the victim of his environment." [16]

Considering his many accomplishments, Drake is most often remembered for his role as founder of the Medical College of Ohio in 1819 and later the Medical Department of Cincinnati College in 1835. The Medical College of Ohio was the first such establishment in Ohio and only the second medical college west of the Alleghenies. Drake had earlier served as a faculty member at Transylvania University in nearby Lexington, Kentucky, the first medical school west of the Alleghenies. Later he would spend ten years from 1839 as Professor of Clinical Medicine at the Louisville Medical Institute, which eventually became today's University of Louisville Medical School. In addition, Drake was an instrumental force in the opening of Cincinnati's Commercial Hospital in 1822. This institution became the foundation for the eventual Cincinnati General Hospital, now a prominent part of the University of

Cincinnati Medical Center complexes.

Drake's writing, educational promotion, and practical service placed him well in the forefront of the Midwest's early movers and shakers. Professor Zane L. Miller saw Drake in the context of the natural growth process rooted in Midwestern urbanization which was the mechanism for conveying civilization. As he stated, Drake over time

"broadened his vision geographically and chronologically to look into the urban future of the Ohio and Mississippi valleys." [17] Drake did not see a natural divide between manufacturing and farming in a community's development nor "between the intellectual and practical man."

[18] Long term planning, organization and structure were critical methods for forging the harmony and the order needed for lasting city success. This became, by the 1830s, even more important given the increasing diversity of those coming to the region from other areas and overseas.

For Drake, conflict and division did not build strong communities and there were many troubling forces found in this era. One such example was alcohol consumption. Drake "placed habitual drinking or intemperance

as one source of disorder which endangered the cities and through them the perpetuation of the union." [19] Furthermore, Drake believed in a community existence not "a confederation of clans". He wanted the Germans, Irish, Scots and English to freely exist and prosper together in their new cities. Drake early on accepted the idea of the frontier "melting pot," an idea that became a key interpretative

Drake saw Whiggery as scientific, for "unlike the idealism of the transcendentalists and the determinist naturalism of the laissez faire Jacksonians; it implied the knowability of the natural universe of which man was a part but with which he was not identical, and the necessity for such knowledge if man was to be more than the victim of his environment."

assumption often used to describe later American immigration history. For Drake, the exception to this collective life was the Black emigrants who were often confronted by mobs opposing their presence, and thus feeding the fires of the disorder Drake found so unsettling. Drake's solution to this tension was for "all free Negroes in the South and emancipated slaves should be barred from traveling to, visiting or settling in the North. They should instead be deported to Africa, preferably Liberia." [20] For historians such as Zane Miller this made Drake "a prisoner of his intellectual era. He inherited a scientific method and set of assumptions about the nature of the world which prevented him from reconciling himself to change as the

natural order of things." [21] The impact of this situation led Drake to embrace institution building as the best method to overcome social obstacles. Institutions provided the means to order civilization in such a large and geographically varied country. This belief drove Drake to the forefront of various civic initiatives in the communities that he called home; making him a critical advocate of continued western growth and development. His approach reflected a nineteenth century positivist mindset very much tied to the idea of steady, irreversible progress.

An often overlooked element in Drake's career in institutional "boostersim" was his promotion of Cincinnati business opportunities for himself and others. Such growth provided the commercial base for long term city success. Along these lines he participated, in partnership with his brother, Benjamin, in the establishment of a drug store on Cincinnati's Main Street (between Second and Third) in 1814. [22] Drake introduced the sale of



Daniel Drake's Soda Fountain circa 1816

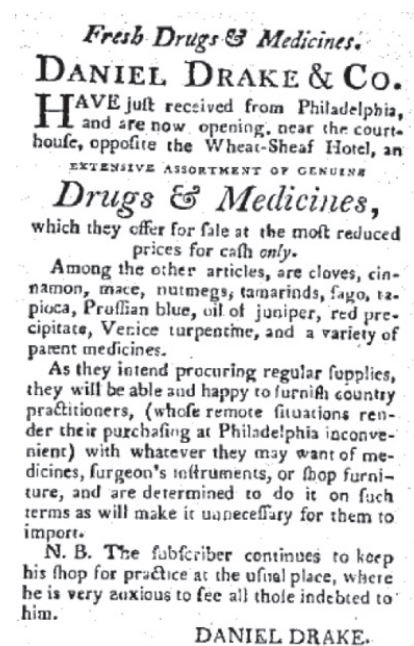
groceries and other general store commodities which were exceedingly common addendums to the apothecaries' wares, and it was suggested that a particularly

appealing establishment feature included the city's first soda fountain. [23]

Gregory J. Higby suggested that: "what became the American drugstore arose in the 19th century from four roots: the traditional apothecary's shop, doctor's shops – where physicians prescribed and dispensed; the general store; and the wholesale druggist." [24] Popular pharmaceutical books became critical tools for the doctors' prescriptions and works such as *The American New Dispensatory* by James Thacher published in 1810, and the *Pharmacopoeia of the United States of America* – published in 1820 by physician-druggists Samuel L. Mitchill and Lyman Spalding – were instrumental sources. [25] The list of drugs numbered over 200 and included ferrous sulfate, potassium nitrate and calcium carbonate. From such chemicals drugs could be prepared according to established recipes that produced silver nitrate, potassium tartrate and calomel (mercurous, chloride) among many medicinal applications. [26] After 1825, journals such as *American Journal of Pharmacy*, which was the first English language pharmacy periodical and one of the first scientific journals published in America, became familiar tools in many doctors' offices. Here articles appeared that matched certain preparations with curative outcomes thus forming the *materia medica* of this era. During the 1830s and 1840s Drake was also well aware of the persistent problem of adulteration, and would have believed wholeheartedly in the many calls for standardization of compounds, so that opium, for instance, a regularly prescribed

remedy, would consistently be of at least 7 per cent morphine. [27]

Drake's interest in this initial drug store enterprise proved short lived, for in 1815 he sold his interest in order to organize a study trip to Philadelphia that winter. As with many doctors of the era the relationship to drug preparation and *materia medica* remained strong and he later re-entered the pharmaceutical trade through his



Fresh Drugs & Medicines.
DANIEL DRAKE & CO.
HAVE just received from Philadelphia, and are now opening, near the courthouse, opposite the Wheat-Sheaf Hotel, an
EXTENSIVE ASSORTMENT OF GENUINE
Drugs & Medicines,
which they offer for sale at the most reduced prices for cash only.
Among the other articles, are cloves, cinnamon, mace, nutmegs, tamarinds, sago, tapioca, Prussian blue, oil of juniper, red precipitate, Venice turpentine, and a variety of patent medicines.
As they intend procuring regular supplies, they will be able and happy to furnish country practitioners, (whose remote situations render their purchasing at Philadelphia inconvenient) with whatever they may want of medicines, surgeon's instruments, or shop furniture, and are determined to do it on such terms as will make it unnecessary for them to import.
N. B. The subscriber continues to keep his shop for practice at the usual place, where he is very anxious to see all those indebted to him.
DANIEL DRAKE.

support for the firm of Isaac Drake and Company, founded in 1816 and managed by his father. This was clearly a successor to the earlier Daniel Drake and Company, *Drugs and Medicines* which hoped to corner the market for the area's growing medical associations. [28]

By all accounts, Drake knew the pioneer druggist's craft well. His teaching appointment in 1817 at Transylvania University in neighboring Lexington, Kentucky was as chair of *Materia Medica* and *Medical Botany*. Such teaching clearly revealed his recognized pharmaceutical expertise as well as a professional interest that persisted throughout his life. It appeared that

his early mixing of medicines, such as turning mercury into mercury ointment in Dr. Goforth's office during his apprenticeship, as well as his commercial experiences in the drug business, combined to have a lasting impact on his approach to treatment and medicine. In most nineteenth century medical practices, every pioneer doctor was ultimately his own pharmacist and preparing standards such as Glauber's salts or sodium sulfate used as a laxative were well known. Dover's powder, which contained opium and ipecac as ingredients, was likewise used to produce sweats seen as vital in the treatment of colds and fever. The plant *nuxvomica* was ingested for digestive and circulation complaints. Paregoric, a mixture of opium and camphor, was another drug that was frequently employed in the treatment of diarrhea as well as coughs. These concoctions plus countless others were seen as essentials in the doctors' nineteenth century arsenal for treating illness.

In addition, Daniel Drake bridged a crucial intellectual divide before the emergence at the end of the nineteenth century of bacteriology and virology. Cell theory had only preliminary notions at this time and had to await the career of Rudolf Virchow (1821-1902) and others for more definite exposition. Spontaneous generation dominated the early elements of germ theory which did not become more fully understood until the careers of Louis Pasteur (1822-1895) and Robert Koch (1843-1910). They would finally link microorganisms to the causation of disease. During Drake's age disease causation and schemes of treatment remained largely tied to past notions of

balancing various bodily humors. Many physicians also were influenced by the idea that miasmas were key causative disease agents. Scientific uncertainty, in addition, bred many schools of treatment, and each embraced a wide theoretical range. Thomsonianism, phrenology, mesmerism, electropathy and hydropathy, all professed curative methods, and as the profusion of nineteenth century medical journals attested, these practices drew many medical disciples who relied on their efficacy.

The Thomsonians, for instance, were followers of Samuel Thomson (1769-1843) who sought health solutions in a Galenic-based botanic humoralism. Physio-medicalism also had popularity and manifested a further reliance on natural botanical cures. Homeopathy likewise had a range of supporters imbued with the teachings of Samuel

Hahneman (1755-1843) whose theories of similia similibus curentur believed disease was best countered with like-for-like low-dose prescriptions. [29] Most doctors however were mainly old school allopaths. They continued to “bleed, purge, plaster and perspire” their patients according to centuries-old established practices. Furthermore there were those who combined health notions such as the Eclectic school. Eclectics drew from a mixed background of treatments that included botanicals and

physical therapy. One educational off shoot of this philosophy was the Eclectic Medical College of Cincinnati which existed from 1845 to 1942. [30]

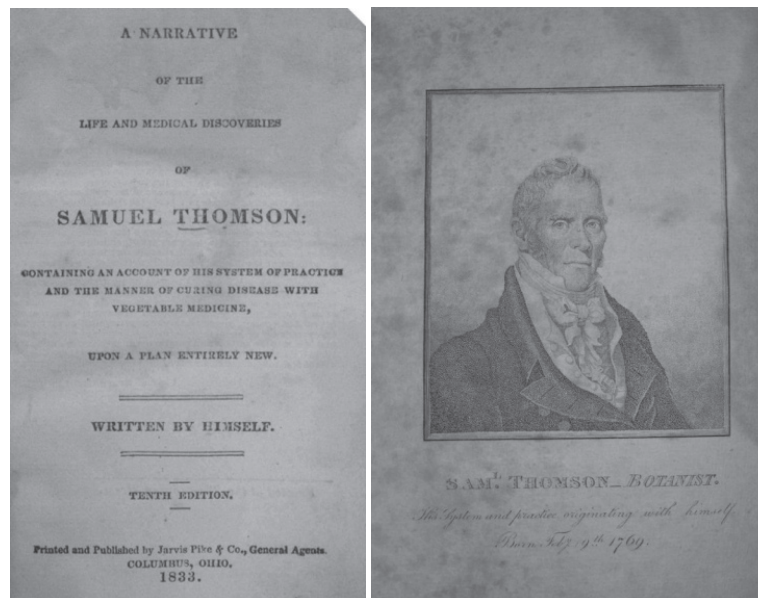
Since infectious diseases were numerous in the nineteenth century and a constant part of a doctor’s practice, differing theories of causation were constantly sought and attracted a range of often unsuccessful treatments. A key example of Drake’s interest in this regard is seen in his investigations of the epidemics of autumnal fever as well as cholera and other endemic regional illnesses. He

between 1850 and 1854 became a major and influential compendium that tied geography, physical conditions, and climate to disease causation and treatments.

This work represented a massive effort on the road to establishing better understanding and reflected Drake’s keen interest and contributions to diagnostic medicine. Drake connected environment with disease, and explored through observations various associations that might explain how disease occurred in America’s vast interior space. [33] Stephen Gelbach stated in American

Plagues that by exploring autumnal fever, “Drake employed his best science to determine origins.... borrowing from army surveys, he produced measurements to identify patterns of disease” [34]. What was observed was that “warm temperature, standing water, and organic matter in the soil—are all associated with autumnal fever.” [35] From his work he believed that “animalcular hypotheses” were more

likely the disease agent, placing him within the early orbit of microorganism causation. Eventually in 1880 causative clarification would come when Alphonse Laveran through his microscope discovered the plasmodium as the infecting factor. By century’s end the mosquito was confirmed as the agent of transmission. As with other medical discoveries throughout the ages, Drake, with his considerable travels, charts and measurements had heartily searched for truth but



explored causation within the context of both Midwestern geography and meteorology where he sought logical explanations for occurrence and distribution. [31] Drake’s approach was to catalogue “the typography around Cincinnati” in order to source both health and disease. [32] Ultimately his most significant contribution to medical history his Systematic Treatise, Historical, Etiological and Practical on the Principle Diseases of the Interior Valley of North America (two volumes) published

ultimately fell short restricted not by intelligence but by his place in the scientific chain of being.

Drake's ultimate success as Eugene Link has noted was as a "medical nationalist" who believed fully that "education should foster western genius" and reflected the modern concept that "medicine is not a physical science but a social profession." [36] His significance was such that the newly formed American Medical Association when commenting upon his death in 1853 remarked that "with the death of Dr. Drake the AMA has lost one of its most honored members." [37] ◆

Notes:

[1] Shapiro HD and Miller ZL, eds. *Physician to the West: Selected Writings of Daniel Drake on Science and Society*. Lexington: University of Kentucky Press; 1970. Page xi. Hereafter cited as Shapiro and Miller, Physician to the West.

[2] Flexner JT. *Doctors on Horseback*. New York: Viking Press; 1937. Page 165.

[3] Early Cincinnati Medicine. *Cincinnati Journal of Medicine, Centennial Issue*. March 1957: 45-46.

[4] Flexner A. Medical Education in America. *Atlantic Monthly*. June 1, 1910; 799. Hereafter cited as Flexner, Medical Education in America. Ira M. Rutkow, M.D. Medical Education in Early 19th Century America. *Archives of Surgery*. (1999), 134 (4), p.453.

[5] *Ibid*.

[6] *Ibid*, 800.

[7] *Ibid*.

[8] *Ibid*.

[9] *Ibid*.

[10] Eversole TW. Medicine in Colonial America. *Draft Manuscript*. D'Elia DJ, Dr. Benjamin Rush and the American Medical Revolution. *Proceedings of the American Philosophical Society*. August 23 1966;110: 227-234.

[11] Horine EF. Biographical Sketch of Daniel Drake, 1785-1852. Reprint from *Cincinnati Journal of Medicine*. June 1928;9:1.

[12] Shapiro and Miller, Physician to the West, xiii.

[13] In the winter of 1816 Drake returned to the University of Pennsylvania to attend additional lectures. On May 11, 1816, The University of Pennsylvania awarded the M.D. to Daniel Drake. The Cincinnati Directory of 1819 (Cincinnati: Morgan Lodge and Company Printers, 1819) stated that there were 22 physicians practicing in the city as of 1819.

[14] Shapiro and Miller, Physician to the West, xix.

[15] *Ibid*, xx.

[16] *Ibid*, xxi.

[17] *Ibid*, xxvi.

[18] *Ibid*, xxxi.

[19] *Ibid*, xxi.

[20] *Ibid*, xxxiii. See also *Dr. Daniel Drake's Letters on Slavery to John C. Warren*. New York: Schuman's; 1940.

[21] *Ibid*, xxxiv.

[22] Horine EE. Cincinnati Unique:

Daniel Drake. Reprint from *Cincinnati Journal of Medicine*. May 1952;33:200-210, 222-238. See also Mansfield, *Memoirs*, p.104. Confusion exists as to the exact opening of Drake's Drug Store. The dates 1810, 1813, and 1814 have at various times been used.

[23] Juettner, Daniel Drake, 41.

[24] Higby GJ. Chemistry and the 19th Century American Pharmacist. *Bulletin of the History of Chemistry*. 2003;28(1): 9.

[25] *Ibid*, 10.

[26] *Ibid*, 11.

[27] *Ibid*, 12.

[28] The Cincinnati Directory of 1819 lists 11 druggists in operation at this time.

[29] Flannery MA. The Early Botanical Medical Movement as a Reflection of Life, Liberty, and Literacy in Jacksonian America. *Journal of the Medical Library Association*. October 2002;90(4):442-454.

[30] Haller JC. The Eclectic Medical College of Cincinnati, 1815-1942: A Profile in Alternative Medicine. Kent: Kent State University Press; 1999.

[31] Gelbach SH. *American Plagues: Lessons from our Battle with Disease*. New York: McGraw-Hill; 2005:71.

[32] *Ibid*, 73.

[33] *Ibid*, 74.

[34] *Ibid*, 77.

[35] *Ibid*, 79.

[36] Link EP. The Social Ideas of American Physicians, 1776-1976. London & Toronto: Susquehanna University Press; 1992: 64-66.

[37] Horine, Pioneer Physician, 409.

Feature

Reflections on a Textbook of Pathology Published 100 Years Ago And Its Author Frank Burr Mallory

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Boston University School of Medicine

Introduction
In 1914 the Philadelphia publishing house WB Saunders (now Elsevier) launched a new textbook of pathology titled "The Principles of Pathologic Histology". [1] It was a substantial tome of 678 pages and included 497 figures containing 683 illustrations, 124 of them in color. The author, Frank Burr Mallory, at the peak of his considerable powers at age 52 and Chief of Pathology at Boston City Hospital since 1908, was eminently qualified for the task. In this brief article I would like to introduce you to FB Mallory, explore his textbook (which you can access online on Googlebooks@[<https://books.google.com>]) and from the perspective of 100 years on reflect on his achievement.

Frank Burr Mallory

Frank Burr Mallory, (Figure 1) the son of a Great Lakes ship's

captain, was born in Cleveland, Ohio on Nov 12th, 1862. He attended Harvard college (A.B. 1886) and Harvard Medical School (AM, MD 1890). [2,3,4] Following graduation he spent a brief stint as a private practitioner in Boston, but was happy to abandon this for an appointment as an Assistant in Histology at HMS, a department in which he had previously worked as a technician. [4]

The end of the 19th century was a pivotal period for American medicine, which had yet to contribute to the great advances in medical discovery that were occurring in Europe, particularly in Germany. Pathology, a specialty that included the microscopic examination of diseased tissues and the new science of bacteriology, counted among its practitioners such luminaries as Rudolph Virchow and his student Robert Koch. This emerging specialty was seen as important to creating a new

era in American medicine. Johns Hopkins had chosen a pathologist, William H Welch, who had studied with the greats in Germany, as its founding Dean of the medical school, and under his leadership, this new medical institution was already considered to be in the vanguard of medical progress and reform. [5] With an eye to this and breaking with a tradition of hiring leadership from within, Harvard recruited William T Councilman, a protégé of Welch's, as the Shattuck Professor of Pathology (Pathological Anatomy) and Chief of Pathology at Boston City Hospital (BCH). [6] On Councilman's arrival in Boston, he appointed the 30 year old Mallory as his assistant.

FB Mallory belonged to the first generation of full time pathologists in the United States. He commenced his career apprenticed to the brilliant and visionary Councilman. In 1893 he spent a year in Europe, with the

highly regarded pathologists, Chiari in Prague and Ziegler in Freiburg, Germany. [2,3] There were no training programs in the US in those early days. Mallory, on his return, dedicated himself to the mission of training future generations of American pathologists. In a 1906 report he described his department at Boston City Hospital as being organized "along the lines of a professional training school". [7] More than 120 graduates emerged from his program over the course of his career. [2] They included many distinguished future leaders in pathology and chiefs of pathology at major US teaching hospitals, whose success contributed to his fame.

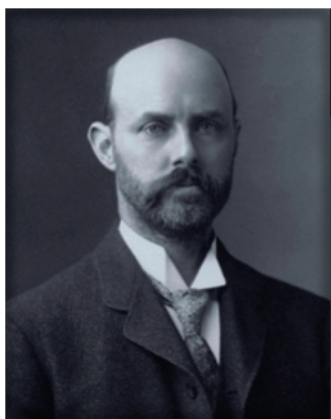


Figure 1 Frank Burr Mallory (courtesy of Kenneth Mallory)

Technical Progress and Proficiency

In the preface to the new textbook, Mallory explains that his purpose was to explore the basis of disease from the morphological point of view. His approach, to paraphrase his own words, was to study disease as it was revealed in perfectly processed and stained tissue sections of early and more advanced lesions. Such studies had allowed him to gain insight into the sequence and nature of disease progression. Since the end of the 19th century the technology to realize this "perfection" had become available. Paraffin embedded tissues would have been sectioned in his laboratory on a rotary microtome, that was invented by a Harvard colleague of Mallory's and eponymously referred to as the Minot microtome. [8] This machine in trained hands could produce exquisitely thin sections and

advance the paraffin block in which the tissue was embedded so that it was presented to the blade to yield serial sections of identical thickness. This had clear advantages over less precise technology available hitherto, that included such rudimentary approaches as manual sectioning with a razor blade.

While natural dyes to stain the otherwise colorless and transparent tissue sections had been available for many years, a notable pair being Hematoxylin and Eosin that is still the standard, contemporary pathologists were excited by the possibilities created by new synthetic aniline dyes being produced in Europe. These dyes not only were retained by the tissue sections (a property, when applied to cloth, called "fastness"), but were also thought to hold the promise of revealing biological secrets by their differential staining of the various cells and tissues. Mallory became an international authority on the use of these dyes in pathology to identify specific tissue components.(9,10) Among the several stain recipes he developed empirically, perhaps the best known among today's pathologists is a stain to discriminate the presence of collagen and other elements, the *Mallory trichrome stain* (Figure 7), which is still routinely used today in pathology laboratories throughout the world.

First Impressions

Leafing, or as I should say, scrolling through the pages of the on-line text, one is struck by the completeness of the morphological description of disease in this 100 year old book. As is currently the practice in modern textbooks of pathology, or a modern pathology syllabus, the labor is divided into general pathology and specific organ pathology. The main topics in general pathology are those processes that underlie all diseases: cell injury and death, inflammation, repair, agents of injury and disease and neoplasia. The chapter headings would be familiar to a present day 2nd year Boston University medical student who had completed the foundation module of the DRX course, and she would be perhaps surprised to find that a substantial part of the foundation had been in place a hundred years ago. In Mallory's textbook she could, to take one example, find a fully adequate description of the histological patterns of tissue necrosis, including coagulation, liquefactive, caseation and fat necrosis. In addition she would encounter still current definitions of terms related to cell degeneration and death, including the euphonious nuclear alterations termed pyknosis, karyorrhexis and karyolysis.

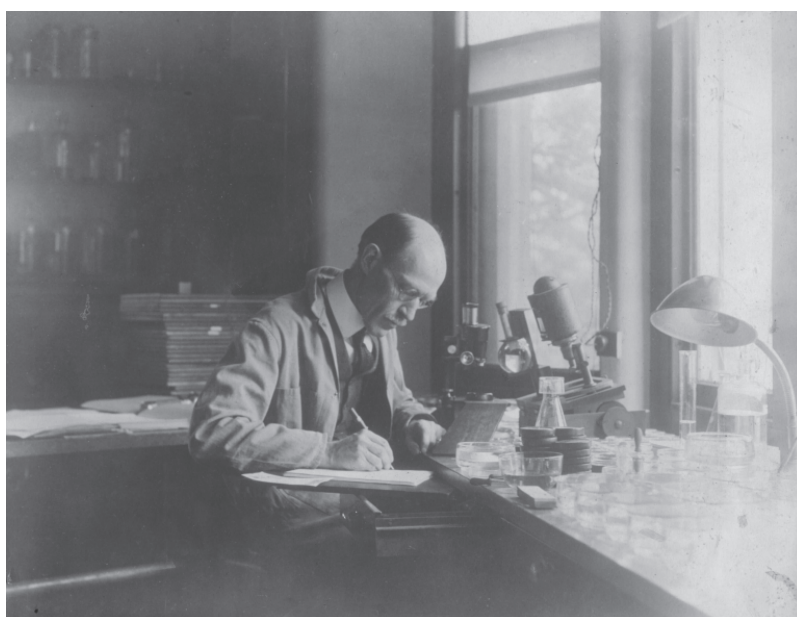


Figure 2. Frank Burr Mallory in his laboratory. Image courtesy Dr.s David N Louis and Robert H Young, Massachusetts General Hospital.

Dominance of Infectious Disease

Today's student would undoubtedly also be struck by the amount of text devoted to infection as the cause of disease. This focus is hardly surprising, however, since as Pathologist to Boston City Hospital, Mallory's main preoccupation and that of his clinical colleagues was infectious disease. In a contemporary photograph of Mallory at work in his laboratory (Figure 3), he is not looking down a microscope, but making notes as he examines bacterial culture plates. He states in a 1906 report that up to 150 throat swabs for diphtheria might be plated in a single day in his laboratory. Diphtheria and scarlet fever had entire wards devoted to afflicted patients at BCH at the turn of the last century. [7] This experience enabled Mallory to author authoritative descriptive studies of the pathology of several major infectious diseases, including pertussis, typhoid, scarlet fever, diphtheria and measles. [11-14] The beautiful camera lucida color drawings of the potentially lethal small intestinal ulcers of typhoid fever in his 1898 paper in the Journal of Experimental Medicine are representative of the quality and elegance of the illustrations throughout his published work and are worth an on-line visit. [13] Tuberculosis (Figure 4) also receives extensive coverage in his text, as you might expect, given that deaths from TB in the decades preceding 1914 exceeded those from heart disease, [15] although their

mortality rate trajectories at this point in time were about to cross (Figure 5). Other prevalent infectious diseases of the time included pneumococcal pneumonia and the various manifestations of syphilis.

The Golden Age of the Autopsy and Descriptive Pathology

Lest we get carried away, there are some notable absences from this 1914 text - a hundred years of medical progress, to be exact. But there are no blank spaces or placeholders awaiting future entries. Rather, within the framework of the knowledge of the period, a seamless medical narrative is built around the anatomical descriptions to attempt to account for each disease's natural history. This was the heyday of descriptive pathology, based largely on gross autopsy findings and their microscopic description. The center of gravity of Mallory's laboratory and of pathology laboratories in other leading medical institutions in the United States and Europe of the time was the autopsy room. In the BCH of his day the standing of Pathology as a specialty was reflected in the magnificence of the building that housed it. The Pathology building (see cover page), opened in 1896, was 2 stories over basement and had about 25,000 sq ft of floor space. The postmortem room was placed within an auditorium extending through 2 floors and had seating for 70 observers. Here Mallory would

have presided over autopsy examinations performed on BCH patients who died from the common fatal diseases of the time and examination of their tissues with the available technologies, informed by the given knowledge of the period, was the fountain from which his scholarship flowed (Figure 3).

Ironically, perhaps, this ascendancy of descriptive pathology reached its zenith in Mallory's era. While making major contributions to medical knowledge and the causation of disease, in the face of questions regarding the underlying molecular mechanisms it was, by its nature, generally mute. It would be several decades before the technology to interrogate tissue sections with molecule specific probes would be available to give it a voice. Over-reliance on observation and description occasionally got the great pathologists of the period onto the wrong track. William T Councilman, relying on his detailed pathological studies of numerous cases, announced (erroneously) to the world that the agent of smallpox was a parasite [16]; and Mallory was similarly drawn in to proposing that a parasite was the germ of scarlet fever based on his histological studies. [14]

FB Mallory it must be said, also actively engaged in experimental work, especially for his career-long studies of liver disease. [17] He occasionally complained that the experimental

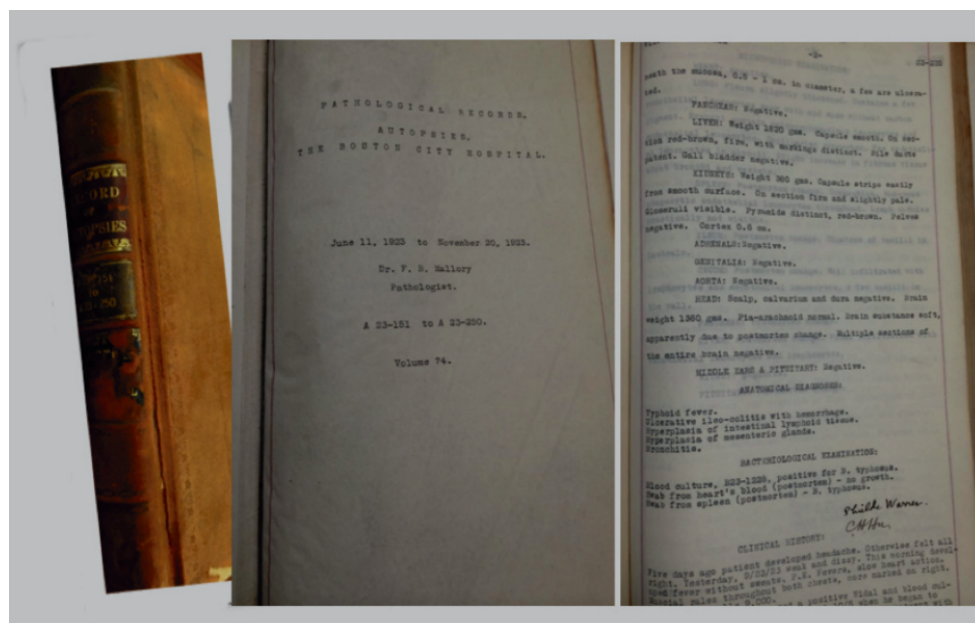


Figure 3 Bound volume of autopsy reports, Boston City Hospital, department of pathology, 1923, opened at a representative report that has a final anatomical diagnosis of Typhoid Fever. The pathologist is Frank Burr Mallory and the signature of one of the residents on the case is that of Shields Warren (1898 -1980), who later became a distinguished Chief of Pathology at New England Deaconess Hospital. (Courtesy of Dr Chris Andry, BMC).

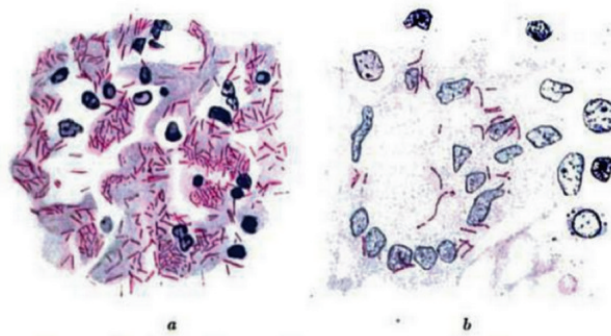


Fig. 112.—Tubercle bacilli. *a*, In inflammatory exudate in alveolus of lung; *b*, in giant-cell.

Figure 4. Image of figure 112, from *Principles of Pathologic Histology* [1], Elsevier 1914. Google books

DEATH RATES FROM CERTAIN IMPORTANT CAUSES OF DEATH IN THE REGISTRATION AREA OF THE UNITED STATES FOR EACH OF THE YEARS FROM 1900 TO 1914.

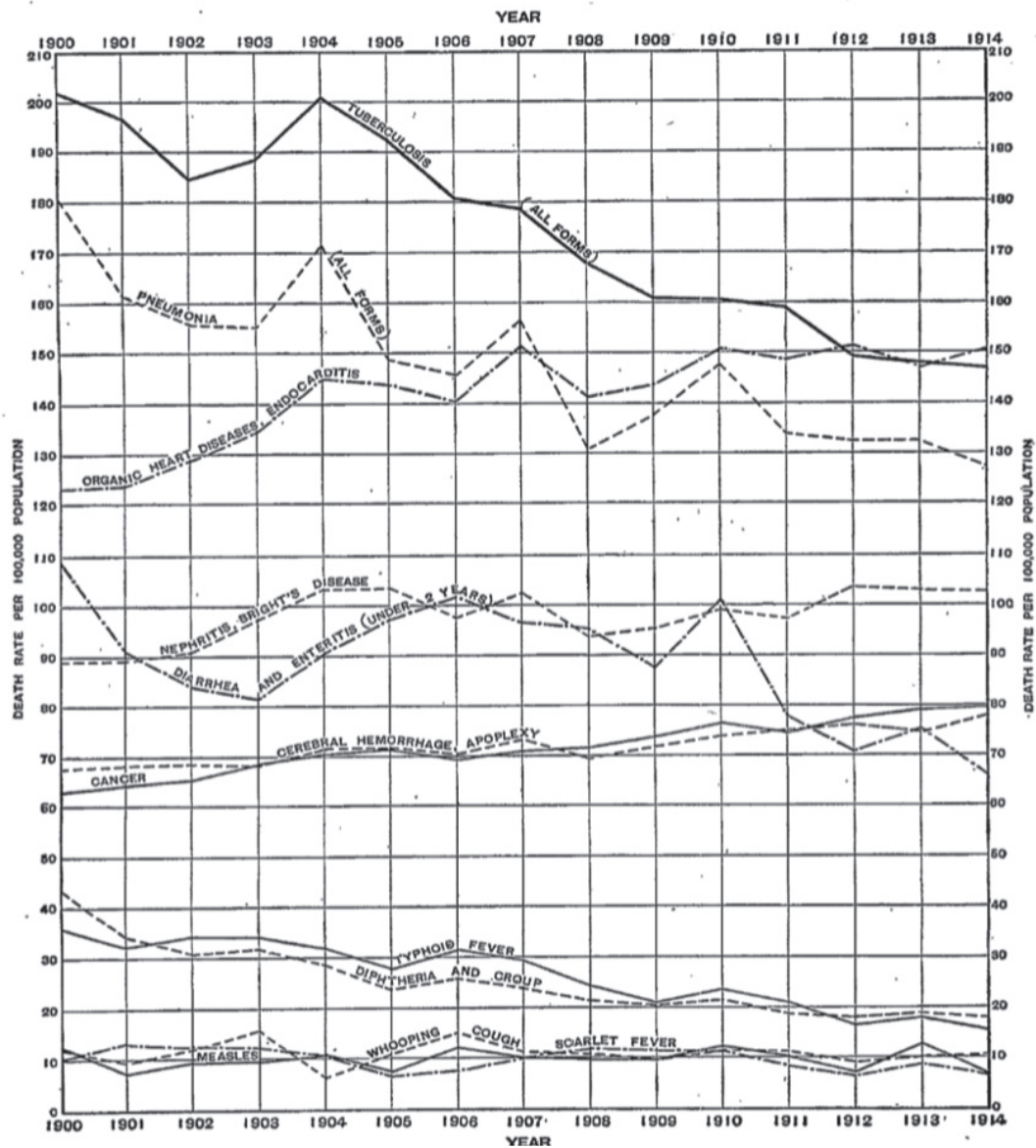


Figure 5. Graphic from *United States Mortality Statistics 1914* [15]

work appeared to add more confusion than clarity. He was referring particularly to his inability to induce cirrhosis in experimental animals exposed to alcohol. Most progress in understanding of disease in the 100 years subsequent to the publication of his textbook would be achieved by medical experiment. There would come a time when other fields of medicine that had developed a stronger emphasis on scientific experiment would eclipse pathology's preeminence as a source of new medical knowledge. Nonetheless, pathological models of disease continue to be important and remain essential as frameworks for many new molecular investigations and the clinical understanding of disease to the present day. For an example, I would point out the indispensability of the pathological model of the polyp cancer sequence, developed by Dukes and Lockhart-Mummery at St Mark's hospital, London, in the 1920s, [18] to the breakthrough in our understanding of the molecular genetics of colorectal cancer achieved by Vogelstein et al. in the late 1980s. [19]

Pathological Technique, an earlier success

This erudite and beautiful foundational textbook had a life of only one edition, probably because of production costs and the outbreak of World War I. Frank Burr Mallory was to become one of the

world's best known pathologists in the first half of the twentieth century. His reputation internationally, in particular, was not due to this book, but to another book that predated *Principles of Pathologic Histology*. In 1895, in collaboration with his friend and colleague, James Homer Wright, who was to become the first head of the pathology department at Massachusetts General Hospital in Boston, he published *Pathological Technique, A Practical Manual for Workers in Pathological Histology and Bacteriology*. [8] This manual became the "bible" of laboratory methods of the period. It was revised in eight subsequent editions, the penultimate published in 1918 and a final edition by Mallory alone in 1938, which he dedicated to Wright who had died 10 years earlier. The manual, with detailed descriptions of state of the art technology and methodology encompassed the scope of the clinical mission of Pathology departments of the time. It is also available on Google books[<https://books.google.com>] and gives us an unequalled insight into the resources and routine activities of a pathology laboratory in the early 20th century.

Mallory's Hyalin

Medical students over many decades have linked the Mallory name to Mallory's hyalin or Mallory bodies, distinctive accumulations in the cytoplasm of hepatocytes that have been injured

by alcohol. More recently Mallory's hyalin was also recognized as a manifestation of non-alcoholic steatohepatitis. Mallory's first description of alcoholic hyalin was in an address to the Johns Hopkins Hospital Medical Society in 1910, later published in the *hospital Bulletin*. [20] One finds a very complete description in his 1914 textbook, and two very elegant camera lucida color plates, one of which we reproduce here (Figure 6). The text describes it as follows: "Hyalin occurs in the liver cells in alcoholic cirrhosis and forms an irregular coarse meshwork. Later the cells undergo necrosis and are invaded by leucocytes". The molecular mechanism underlying this process may prove to be a manifestation of a unique form of programmed cell death, called necroptosis. The process contrasts with another unique form of programmed cell death, called apoptosis and differs in its underlying molecular mechanism, and also in that it evokes an acute neutrophilic inflammatory response as occurs in conventional tissue necrosis. Interestingly, the first pathological description of that other major form of programmed cell death, apoptosis, recognized first as such in the 1970s, [21] is often attributed to William Councilman in a treatise he wrote in 1892 describing the pathology of liver injury in yellow-fever (Councilman bodies). [22]

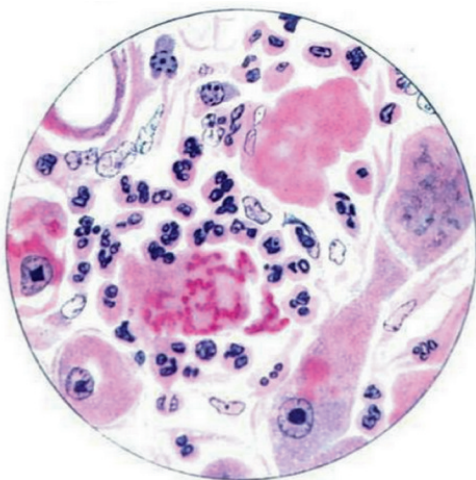


Fig. 386.—Liver. Alcoholic cirrhosis. Liver cells containing hyalin undergoing necrosis and attracting chiefly polymorphonuclear leukocytes.

Figure 6. Mallory's hyalin. Figure 386 from *Principles of Pathologic Histology*, Elsevier 1914. [1] Google books.

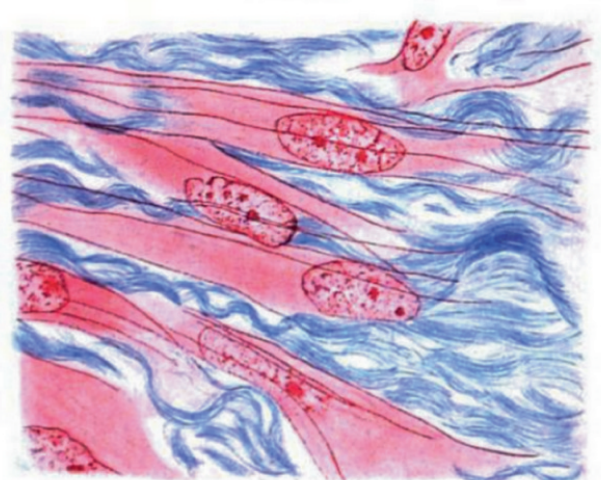


Fig. 180.—Fibrosarcoma. Cells viewed flatwise; fibroglia fibrils red, collagen fibrils blue.

Figure 7. Mallory Trichrome Stain. Figure 180 from *Principles of Pathologic Histology*, Elsevier 1914. [1] Google books.

Tumor Pathology

Tumors, a major component of a modern pathology textbook, are described comprehensively, with the insight of the times, in *Principles of Pathologic Histology*. The descriptions are accurate in the essentials by today's lens and many are beautifully illustrated. They are ordered by cell and tissue embryonic origin in a coherent way that presages modern classifications. Oncologic pathology is probably one area of pathology where anatomic description was not exhausted in the early 20th century but continues to be added to as molecular probes, clinical trials and responses to new therapies reveal previously unrecognized morphologic variation and clinically significant histological patterns. A major change that has occurred in the interim, however, is that morphologic description of tumors is no longer considered sufficient for classification of many tumor types, but requires additional biomarkers particularly molecular genetic characterization.

exists in the bone marrow another peculiar type of cell which they call the bone marrow plasma cell and that from it this tumor arises. Time alone will tell." His academic tentativeness on this point is interesting, given that his friend and colleague, James Homer Wright at the MGH had advanced this theory of a plasma cell histogenesis in a paper published in the *Boston Journal of Medical Science* in 1901. [23] On other subjects, we find him to be more dogmatic, notably on Hodgkins disease which he described as a mixed bag of pathology and eschewed its usage: *"The term Hodgkins disease is inexact and should not be used. It always covers ignorance of the true nature of the lesion"*. He illustrates an example of a lymph node process that might be classified as Hodgkins lymphoma and opts for an alternative term lymphoblastoma-sclerosing variant as shown in this illustration. Controversies on the classification of Hodgkins lymphoma remain alive and well a century later.

Honorary Fellowship of the Royal College of Pathologists of Great Britain and Ireland and the Gold headed cane award of the American Association of Pathologists and Bacteriologists. He was Editor in Chief of the *American Journal of Pathology* from 1923 to 1940. He had two sons, both of whom became distinguished pathologists and chiefs of pathology departments, Tracy Burr Mallory (1896 - 1951) at the Mass General Hospital and George Kenneth Mallory (1900- 1986) at Boston City Hospital and Boston University School of Medicine. The City of Boston in 1933 named a new pathology building at BCH (The Mallory Institute of Pathology) in his honor. He died, at the age of 78, on September 27th, 1941. It is gratifying that one hundred years after its publication, his textbook of pathology is accessible to all and remains extant as a memorial to his scholarship and achievement.



Notes:

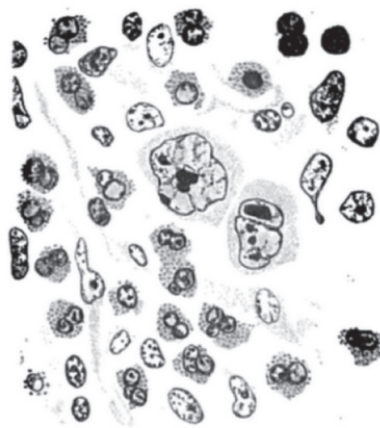


Fig. 246.—Lymphoblastoma. Scirrhus type of tumor; only two tumor-cells present; numerous eosinophiles.

Figure 8. Figure 246, from *Principles of Pathologic Histology*, Elsevier 1914. [1]

Google books.

Among the many fascinating discussions of tumors one can find in this book is one on the potential origin of multiple myeloma, in which Mallory "wonders aloud" if it might be a plasma cell: *"The type of cell in this tumor has not been determined. Evidently it does not belong to the myeloblast series of cells because it does not differentiate like them.... It is claimed by some writers that there*

Achievement Acknowledged

Frank Burr Mallory was among the ablest and most admired individuals to have worked and strived for medical excellence in this corner of Boston in the twentieth century. He received many awards during his career including honorary degrees from Boston University and Tufts University, the Kober Medal of the American Association of Physicians,

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