The Department of Obstetrics and Gynecology at Yale: the First One Hundred Fifty Years, from Nathan Smith to Lee Buxton

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The persons who directed the academic teaching of women's health at Yale Medical School are presented by biographical sketches recounting their achievements and some of the difficulties they encountered. Three who provided particular catalysis were Nathan Smith, Herbert Thoms, and Lee Buxton.

This essay describes the professional career of the individuals appointed to direct women's health at Yale Medical School during its first 150 years (1813–1867) (Table 1). Obstetrics and gynecology as a major subsection of medical practice was unknown at the beginning of the nineteenth century. At that time, normal and abnormal pregnancy was usually dealt with by midwives, sometimes in consultation with male-midwives, who were more frequently physicians rather than surgeons. What is now gynecology was part of surgery. The founding of Yale Medical School in 1813 coincided with the beginning of scientific medicine, and its first Professor of Materia Medica and Surgery, Nathan Smith, was coincidentally also Professor of Obstetrics. Remarkably, his claim to gynecologic fame rests on his invention of a surgical procedure, an oophorectomy, that was really not designated gynecology until the first half of the twentieth century. The American Board of Obstetrics and Gynecology was established only in 1930, and The American College of Obstetrics and Gynecology was not established until 1946. The first scientific medical school, Johns Hopkins, kept gynecology with surgery, and maintained obstetrics separately until 1939, and Harvard combined the two only in 1959. As gynecology was considered part of surgery, obstetrics was associated with pediatrics.

At Yale from the earliest days, the title of the chairman of obstetrics was frequently combined with that of diseases of children. Unfortunately, available information concern-

\textbf{Table 1. Professors of Obstetrics at Yale Medical School from 1813 to 1967.}

| Years         | Professor               |
|---------------|-------------------------|
| 1813 to 1829  | Nathan Smith            |
| 1829 to 1830  | Thomas Hubbard          |
| 1830 to 1856  | Timothy Phelps Beers   |
| 1856 to 1863  | Pliny Adams Jewett      |
| 1864 to 1880  | Stephen G. Hubbard      |
| 1881 to 1885  | Frank Beckwith          |
| 1886 to 1899  | James Campbell          |
| 1900 to 1914  | Otto G. Ramsey          |
| 1915 to 1920  | Josiah Morris Slemons   |
| 1921 to 1945  | Arthur H. Morse         |
| 1945 to 1952  | Herbert W. Thoms        |
| 1954 to 1967  | Charles Lee Buxton      |

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ing the professors of obstetrics from the early history of the Yale Medical School is very sketchy. The only scientific reports which survive from the nineteenth century are those of Nathan Smith. His nineteenth century successors were essentially teachers, and the publication of books, scholarly reports, and papers only came about during the early twentieth century. The first scientific obstetrician at Yale in a modern sense was Herbert Thoms. The knowledge explosion of the last third of the twentieth century had a special effect on scientific inquiry, particularly in obstetrics and gynecology, and led to the sub-specialty division that exists today. Lee Buxton ushered in that era in 1954.

BACKGROUND

Formal medical education at Yale College began at the beginning of the nineteenth century at the height of the Napoleonic Wars in Europe. Up to that time medical training in the United States was based on an apprentice system. Formal courses were available only at Harvard, Columbia, Dartmouth, Philadelphia, and the European schools. Although Ezra Stiles (Figure 1), President of Yale College, had outlined a detailed plan for a medical school and for a Professorship of Medicine as early as 1777 [1] it took another 30 years for the physicians of Connecticut to be sufficiently organized for the realization of Stiles' dream. It took this amount of time for the individual medical societies, of which New Haven was one of the first, to persuade the General Assembly of the State to grant an Act of Incorporation [2]. It is of interest that Yale College required the support, help, and cooperation of the organized physicians of the state to found a medical school. The Connecticut Medical Society was finally founded in 1792, the delay being

Figure 1. Ezra Stiles, 1727–1795; seventh President of Yale; lawyer; pastor at Newport, Rhode Island and New Haven. Portrait by Moulthrop.
caused by lay fear of a medical monopoly. The State Medical Society was given the authority to appoint examining committees, to issue licenses to those found qualified to practice physic and surgery, and to confer honorary degrees in medicine [3]. The Society was very supportive of the formation of the medical school, particularly as many of its members were graduates of Yale College. President Stiles and then his successor Timothy Dwight (Figure 2) (the grandson of Jonathan Edwards), solicited the support of the State Medical Society for the foundation of a medical school in Yale College [4]. Other persons instrumental in the creation of the medical school, were Fitch Cogswell (Yale 1780) and Eli Ives (Yale 1779) (Figure 3), both members of the Connecticut State Medical Society. Negotiations between Yale College and the State Medical Society took a long time as the latter met only once a year!

In 1802 a Professorship of Chemistry was instituted, and the Chair was offered to Benjamin Silliman (Figure 4) who was then a tutor in Yale College studying law. To prepare himself for his new task, Silliman went to Philadelphia, then the center of scientific learning in North America and the venue of the prestigious American Philosophical Society. He studied anatomy and surgery with Casper Wistar, natural philosophy with Benjamin Smith Barton, and chemistry with James Woodhouse, all professors in the medical school in Philadelphia.

The first appointments to the clinical faculty were those of Mason F. Cogswell as Professor of Surgery and Anatomy and of Jonathan Knight (Figure 5) as Assistant Professor [5]. Cogswell was the leading surgeon in Connecticut, was prominent in civic affairs, and had been celebrated as one of the "Hartford Wits." He was a pioneer of social reform and established the first institution in the United States for the treatment of the deaf and dumb. He was also the founder of the Hartford Retreat for the Insane. It turned out that neither appointee assumed his post. Cogswell preferred to stay in Hartford where all his interests lay. Knight's appointment was changed to that of Professor of Anatomy and Physiology.

Figure 2. Timothy Dwight, 1752–1817; eighth President of Yale; Livingston Professor of Divinity; revolutionary chaplain; member of the state legislature. Portrait by John Trumbull.
The Yale Corporation therefore urgently needed to find a competent and experienced clinical teacher, preferably with administrative skills, and found him in Nathan Smith (Figure 6) who was then at the medical school he had founded at Dartmouth.
NATHAN SMITH

Nathan Smith's career is described in some detail because he was one of the first scientific clinical teachers in the United States. Gynecology claims him as an innovator: for him oophorectomy was but a small part of his repertoire. Most remarkably he founded three other medical schools, and he and his sons contributed to the founding of several more.

Smith's ancestors came to Hingham, Massachusetts from Hargham in England in the vessel Diligent in 1638. Nathan was born September 30, 1762 in Rehoboth, Massachusetts on the state line between Massachusetts and Rhode Island. The family moved to Chester, Vermont when he was a child. His father was a farmer-surveyor and his mother, a midwife, but he had no formal education outside the home. In the War of the Revolution he rose to the rank of Captain at the age of 18. Following the surrender of Cornwallis at Yorktown, he returned to Chester where he became the village school teacher. From this origin arose "one of the most interesting and important figures in American medicine" [6]. In 1783 Josiah Goodhue, a well-known surgeon of the Upper Connecticut Valley, was called to perform an amputation for a compound leg fracture. Goodhue asked for a volunteer to help in this operation, and Smith stepped forward. He not only supported the leg, but "even ligated the vessels as they were clamped and did so without tremor" [7]. This experience gave Smith the courage to ask Goodhue for an apprenticeship training in medicine. Goodhue advised him to first "improve his education at least to the point equivalent to a Freshman at Harvard College" [7]. He therefore studied for a year with the Reverend Samuel Whiting and was then apprenticed to Goodhue. In addition, he trained in obstetrics with Dr. Lemuel Dickerman of Brattleboro. Four years later he set up practice in Cornish, New Hampshire. After two years, still feeling his education was inadequate, Smith went to Harvard Medical School. He obtained his Bachelor of Medicine degree in 1790, the only successful candidate that year and only
the fifth graduate of Harvard Medical school [8]. He returned to Cornish and soon had a busy practice and apprentices of his own. He was greatly interested in education and was one of the first to appreciate that more instruction in basic science was required. At that time, Harvard was the only medical school in New England and was not very prosperous, even under the tutelage of John Warren, Benjamin Waterhouse, and Aaron Dexter. Financial constraints made it difficult for young students to attend Pennsylvania Medical College or the Medical School of King's College New York (now Columbia). Therefore, in 1796 at the age of 34, Nathan Smith boldly applied to the Trustees of Dartmouth College for "a Chair of the Theory and Practice of Medicine." Dartmouth College was twenty-five years old at the time. While approving the Professorship, President John Wheelock, "because of lack of resources" [7] postponed final action for one year. During this period, Smith visited London and Edinburgh and brought back a medical library and laboratory equipment for his new school. He lectured on anatomy, surgery, chemistry, and the theory and practice of physic. Oliver Wendell Holmes later commented that Smith occupied "not one Chair, but a whole settee of Professorships" [9]. His income derived from students' fees of $133 for the required two courses and his private practice. By 1807, thirty-five students were enrolled and some $600 funds were obtained from the New Hampshire legislature. President Wheelock, coming from one of Nathan Smith's lectures, was so inspired that he led evening prayers; "O' Lord we thank Thee for the oxygen gas, we thank Thee for the hydrogen gas and all the gases. We thank Thee for the cerebrum and the cerebellum and the medulla oblongata" [9].

For a time, Nathan Smith (Figure 6) was a one-man medical school, but he was soon joined by Lyman Spalding to lecture in chemistry and materia medica and then by Cyrus Perkins for clinical help. The latter was appointed Professor of Anatomy and Surgery in 1810. Nathan Smith was in demand for the most difficult cases. He travelled widely across New Hampshire and Vermont, always on horseback and usually with his apprentices. Clinical teaching and discussion went on throughout their journeys. In the legisla-
ture he supported issues such as the control of quackery and of bone setting and the licensing of cadavers for anatomic dissection. By 1812 Dartmouth was a successful medical school with a new medical building of brick containing the first surgical teaching amphitheater in New England. The class number had increased to seventy-four.

Smith's appointment to Yale College was initially opposed by President Timothy Dwight who thought him an infidel [10]. He was considered a free-thinker in the pattern of Voltaire and Rousseau and to have been influenced by the writings of Tom Paine. After further correspondence between Cogswell and Silliman and Nathan Smith, the college authorities were reassured about Smith's religious orthodoxy, and his appointment as the first Professor of the Theory and Practice of Physic, Surgery and Obstetrics was confirmed. His was the sixth such appointment in the country.

His departure from Dartmouth for New Haven was delayed by a typhoid epidemic in the Connecticut River Valley, and Smith did not arrive at Yale until October 1813. The medical college building was initially sited at Grove and College Streets not far from the town cemetery and remained there until 1859 when it was sold to Joseph Sheffield for his scientific school. With the proceeds from that sale Yale purchased property on York Street, part of its present medical campus.

While at Yale Smith made his greatest contribution to surgery as a practitioner, teacher, and statesman. He dominated the first twenty years of the medical school and enrollment increased in spite of rigid admission requirements. Formal courses were given during the fall and winter by Nathan Smith, Eli Ives, Eneas Munson (Figure 7), Benjamin Silliman, and Jonathan Knight. During the summer both faculty and students pursued clinical activities.

Smith's publications were not numerous, but two remain classics. The "Practical Essay on Typhous Fever" relates the first clear description of typhoid and its pathology. Long before Pasteur, Koch and the advent of the germ theory of disease, Smith recog-

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Figure 7. Eneas Munson, 1734–1826; Professor of Materia Medica; founder the Connecticut State Medical Society. Portrait by William Jennys in the Yale Medical School Rotunda.
nized that typhoid was due to a specific cause, was self-limiting, and unlikely to recur. He understood the main cause of death was dehydration and therefore prescribed fluid therapy. He thus opposed the then standard teaching of Benjamin Rush of Philadelphia who advocated bleeding, purging, and sweating. Only the advent of chloramphenicol further changed therapy effectively.

The second classical contribution was his paper on "The Pathology and Treatment of Necrosis." He advocated adequate drainage and removal of sequestrum with osteomyelitis, and thus frequently avoided amputation which was then standard treatment. In this he was several generations ahead of his peers. He introduced several other surgical innovations, and one is of specific significance for gynecology. On July 5, 1821, he performed an oophorectomy. This was the second such procedure performed in the United States, although Smith apparently was not aware of Ephraim McDowell's feat in Danville, Kentucky eight years earlier. He had previously performed an autopsy on a patient with an ovarian tumor that showed "the tumor adhered to no parts except the proper ligament which was no larger than the finger of a man." He was therefore confident that the tumor could be removed surgically. Unlike McDowell, he ligated the pedicle and allowed it to fall back into the abdomen instead of exteriorizing it as was the previous practice [11]. With this application of pathologic research to an innovative surgical procedure he could therefore be regarded as the first academic gynecologist.

Smith did not confine his teaching and practice activities to Yale, but continued to lecture at Dartmouth. He helped found yet another medical school at Bowdoin and was special lecturer in the new medical school at Burlington, Vermont where his second son, Ryno Smith, was Professor of Anatomy and Physiology. Ryno Smith later moved to Philadelphia and helped found Jefferson Medical College. In fact, all four of his sons graduated from Yale Medical School, and nine grandsons and six great-grandsons entered medicine. One grandson, David Paige Smith, was appointed to the Ives Chair of the Theory and Practice of Medicine at Yale in 1873. In New England no man contributed more than Nathan Smith, not only to the birth of scientific surgery, but to the early evolution of the modern medical school. He died quite suddenly of a "febrile illness" on January 26, 1829, at the age of 66 [12].

THE SILENT CENTURY 1829-1914

Thomas Hubbard 1776-1838 (Figure 8) was appointed to succeed Nathan Smith as Professor of Surgery and Obstetrics. Aged 55, at the time of his appointment, he was a successful and conscientious rural practitioner from Pomfret, Connecticut. Hubbard remained as Professor of Surgery until 1838. Unfortunately, no record of any of his writing appears to have survived. Nathan Smith's charge had included the teaching of obstetrics and, in 1821, Eli Ives added to the curriculum a course on diseases of children. Jonathan Knight then suggested to the Yale Corporation that obstetrics and diseases of children merited a separate Professorship and, in 1830, Timothy Phelps Beers (1789-1858) (Figure 9) was appointed to that Chair. Beers had received the M.D. degree from Yale and, although he was a popular physician with a large practice of 5,000 patients, he was a painfully diffident teacher. His lectures in obstetrics, it was said, were illustrative of difficult and protracted delivery. He held his professorship until his death in 1856. At that time, as at the present, Yale medical students were required to write a thesis for the M.D. degree, and, in 1836, one student wrote on "Auscultation in Pregnancy" [13]. Seventeen years after Laennec had described the stethoscope, this work perhaps represents its first application to fetal monitoring. Beers was succeeded by Pliny Adams Jewett (1816-1884) (Figure 10) who was appointed Surgeon in Chief to the Knight's Hospital in New Haven during the war between the States [14]. Because of this major
commitment, Jewett resigned the Professorship and was succeeded by Stephen Hubbard (1816–1904) who was named Professor of Obstetrics in 1864, a designation changed to Obstetrics and Diseases of Women and Children in 1867. This was an appointment that

Figure 8. Thomas Hubbard; Professor of Surgery, 1829-1838. Professor of Obstetrics, 1829–1830. From the portrait in the Yale Medical School Rotunda.

Figure 9. Timothy Phelps Beers; Professor of Obstetrics, 1830–1856. From the painting by Nathanial Jocelyn in the Yale Medical School Rotunda.
created uncertainty and bad feelings in the medical school. It led to the resignation of Jonathan Knight who felt that Hubbard was an uncooperative and peppery individual. This incident marked the first open controversy in the history of the medical school during its first half century. Hubbard attended only 32 births in 15 years and was finally forced to resign [15, 16].

The next Professor of Obstetrics and Diseases of Women and Children was Frank Beckwith (1812–1894) [17], who came from a long line of Connecticut physicians. He had trained at Bellevue Medical College, at Jefferson in Philadelphia and obtained the M.D. degree from Columbia in 1871. After this training, he spent the next nine years as resident physician in the Nursery and Child's Hospital in New York. He taught child health and gynecology, using "quizzes" and was recognized as the best teacher at Columbia. Prior to assuming his post at Yale in 1881 he spent a year studying in Europe. He was a careful clinician, was a skilled operative obstetrician, was painstaking in hygiene, and was skeptical of the use of drugs. He was a kindly, sociable person and an enthusiastic mountaineer having climbed the Matterhorn twice. Beckwith's international standing was recognized by fellowships in both the British Gynaecological Society and the International Association of Obstetricians and Gynecologists.

By 1885 significant financial difficulty at the Yale Medical School forced Beckwith to resign because he could not afford his Professorship. "I am unwilling to continue teaching for the salary paid" he wrote to F. B. Dexter, Secretary of Yale College, May 22, 1885 [18]. James Campbell (1848–1899), who succeeded Beckwith in 1886, was able to survive financially by becoming the first clinical professor in the medical school. Campbell obtained his medical degree from the University of Vermont and practiced in Hartford where he was also president of the Board of Health, a post he retained until his death in 1899.

The New Haven Dispensary had opened on Crown Street on December 1, 1871 and
moved to York Street in 1878. A training school for nurses, the second in the country, opened in October 1873 and was housed in what is now the Hope Building. The hospital moved to Congress Avenue in 1873, and about this time the medical school severed its association with the Connecticut Medical Society and became separately incorporated as a graduate school of Yale College.

Upon Campbell's death, the Chair of Obstetrics was occupied by Otto G. Ramsay (1870–1914) [19]. Ramsay had graduated from the University of Virginia in 1890 and trained with William Osler and Howard Kelly at Hopkins. He was in private practice with Kelly in Baltimore. The obstetric wards were not used for teaching, and the clinical material was insufficient so that most senior students took additional courses at New York Lying In Hospital. Ramsay's salary was so small that he had to use the obstetric and gynecological wards of the hospital as his private clinic [20]. Although the department was an educational failure and Ramsay had no research budget and no full time assistants [21], when he died in 1914 his patients created a prize in his memory.

THE BEGINNING OF THE MODERN ERA

Yale was one of the medical schools rated by the 1910 Flexner Report as being "worthy of continuing existence." As part of the subsequent reforms initiated by Dean Blumer and the Yale Corporation, the Department of Obstetrics was reorganized and was the first clinical department at Yale where faculty were hired on a full-time basis. In 1914 Josiah Morris Slemons (1876–1948) [22], a Hopkins graduate, formerly Professor of Obstetrics and Gynecology in the medical department at the University of California and a well-known teacher and writer, was charged with the organization of the department. The Assistant Professor appointed was Arthur H. Morse, also a Hopkins graduate. Herbert Thoms, who was to play an important role later, was laboratory assistant. Six years later Slemons resigned to return to his practice in Los Angeles, and Morse was appointed Chairman.

Arthur Henry Morse (1880–1950) [23] had graduated from Tufts and Johns Hopkins (Figure 11). After a year of training in pathology in Rhode Island, he was resident instructor in obstetrics at Johns Hopkins from where he moved to San Francisco before coming to Yale. He was one of the Charter Members of the American Board of Obstetrics and Gynecology. Three of his trainees from Yale became full professors in the specialty. He was an authority on gynecologic pathology, and was instrumental in bringing to Yale Gertrude van Wagenen (1893–1978) (Figure 12) who initiated the Macaque Primate Colony that eventually led to the definitive description of the reproductive physiology of both the male and female macaque [24]. This work at Yale permitted better understanding of human reproductive physiology, and incidentally, also allowed the discovery of the morning-after pill. Morse's publications were concerned with problems in obstetrics, and it is of note that only 15 are listed over the 28 years of his chairmanship. He was "an unsparing and fine teacher with sure insight, deep interest, and unfailing kindness" [25]. As Thoms said of him, he showed natural dignity with nobility, but no heraldry. He was always impeccably dressed in a clean, long, white coat and wore a fresh flower in his button hole [26]. He became Emeritus in 1948 and died in 1950 at the age of 70. He was succeeded to the Chair by Herbert Thoms.

THE BEGINNING OF SCIENTIFIC OBSTETRICS AND GYNECOLOGY

Herbert Thoms (1885–1972) (Figure 13) was born in Waterbury, Connecticut, January 5, 1885 and came to Yale Medical School directly from high school. After he obtained the M.D. degree at age 25, he interned at Backus Hospital in Norwich and Memorial Hospital in New London and then did residency training at Sloane Hospital for
Women in New York. He then went to Johns Hopkins and later joined the Yale Department of Obstetrics and Gynecology in 1915. Thoms was a man of many talents and interests. His major scientific contribution was the introduction and refinement of x-ray pelvimetry [27]. Thoms' view of the pelvis set the standard of his time. He made comparative studies of the male and female pelvis [28], wrote extensively on pelvic capacity and popularized lateral x-ray pelvimetry which even now may occasionally be useful [29]. He described variations in pelvic shape in 300 primiparous women. He designed the outlet pelvimeter. Routine x-ray pelvimetry remained standard procedure at Yale in all primipara until 1967.

Thoms' social medical innovation was the introduction into the United States of natural childbirth, a philosophy pioneered in England in 1947 by Grantley Dick Read. The concept that childbirth can be achieved without fear and with controlled pain was demonstrated in a clinic population by Professor William Nixon of University College Hospital, London. It was through him that this innovation reached New Haven. Dr. Sheila Ransom, the first obstetric anesthesiologist, who taught natural childbirth at University College Hospital, paid numerous visits to New Haven. Thoms himself lectured extensively on this subject. Given this liberal and effective teaching by the Professor of Obstetrics at Yale, it was surprising that as late as 1965 women in labor in New Haven were restrained with wrist straps at the time of the delivery. Fortunately this practice has ceased. His other work in the realm of social medicine was with Planned Parenthood of Connecticut in which he served as medical advisor.

Thoms was also an accomplished artist and engraver (Figure 14) as well as a keen fisherman and sailor. Finally, Herbert Thoms was a historian. He was knowledgeable and wrote extensively about the early colonial period of Connecticut, and about the early days of the medical school. Dr. Thomas Forbes said of him "that he was one of the last of the Connecticut Yankees, as they used to be, he went his quiet and unswerving way, content.

Figure 11. Arthur Morse, Professor Obstetrics and Gynecology; 1920–1945.
to do the job well and not for glory. He fought for half a century for women's rights to bear children when they wanted them, in safety and without fear or regret [30]."

Thoms' contributions to his profession and school won him the Yale Medal and the Lasker Award. Through all his awards he went unchanged, calmly and skillfully doing the work he loved. He was described as always sagacious, kindly, forthright and unting, finding old facts and new ideas where others had not thought to look [30]. His favorite aphorism was "the young men know the rules, but the old men know the exceptions." Thoms became Emeritus in 1952 and died in 1972 at age 87.

In addition to the work of the Chairholders, the careers of two other individuals serve to illustrate the development and differentiation of the field at Yale. Orvan Hess joined the department in the mid-1930's and became a leader in fetal monitoring in obstetrics. John McLean Morris joined the department in the early 1950's and brought strengths in gynecologic surgery and in endocrine pathology.

Orvan Hess was a resident during Thoms' tenure as Chairman and later joined the clinical faculty. Hess had obtained his M.D. degree from Buffalo and then came to Yale for his residency in 1932. He was the Davis and Geck Research Fellow from 1933–1935 and subsequently joined the clinical faculty. After the Second World War he became the Director of Fetal Electrocardiography and Uterine Contraction Studies Group. Subsequently, he was instrumental in the early clinical and electronic research that led to the fetal monitoring system developed at Yale, and the first paper on this subject was co-authored by Hess and Hon [31]. He was the first to develop radiotelemetry of the fetal electrocardiogram in 1963. He had a distinguished clinical career, played a significant role in state and national American Medical Association affairs and was consultant to the Commissioner of Health for Connecticut.

Hess recently recalled the House Staff arrangements at Yale New Haven Hospital in the 1930's. The House Staff consisted of interns, assistant residents, and residents who

**Figure 12. Gertrude van Wagenen.** From group photograph in Department of Obstetrics and Gynecology.
were members of the residency program in surgery, gynecology, and obstetrics. The internship consisted of a twenty-month period. Two interns selected from a large group of applicants from across the nation, many of whom had previous experience in research, were appointed in March, July, and November to serve on a rotating basis on surgery, gynecology, and obstetrics, and also the surgical subspecialties such as urology, orthopedics, and neurosurgery. At the end of the twenty-month internship period, two interns were selected to serve as residents for a period of eighteen months (six months each in surgery, obstetrics and gynecology, and urology and orthopedics). When this training period had been completed, the resident was considered qualified to enter private practice. However, many chose to continue with an additional year as a resident. These residents elected to serve a term of 12 months in surgery, obstetrics and gynecology, or another specialty. Due to lack of available openings at any given time, some chose to do research or surgical pathology during this waiting period.

The resident physician staff was housed in the hospital. The interns lived on the third floor along the corridor between Fitkin and Boardman in rooms minimally equipped with a bed and a desk. Telephones existed at the end of the corridor. Residents were favored by having a suite with a telephone in the room. There were two separate library-recreation rooms with a pool table. All meals were taken at the main dining room on the fifth floor where the entire faculty, staff, and guests were accommodated. Interns at that time earned $25 a month and residents $100 a month, and uniforms and laundry were provided.

From September 1953 to March 1954 Luther Musselman (1895–1973) was interim chairman. Dr. Musselman’s career is of interest in that it is also representative of the high caliber of the part-time private faculty of the Department of Obstetrics and Gynecology. He had a B.S. degree from Pennsylvania College and an M.D. degree from Johns Hopkins and then obtained a Ph.D. from Yale in 1923. He went through the residency, on into practice, and became clinical professor in 1946 and Emeritus in 1963.
At this time there was little gynecological surgery practiced or taught at Yale, so in 1952 Dean Hugh Long and Gustave Lindskog, the Professor of Surgery, invited John McLean Morris (1914–1993) [32] to New Haven to remedy this shortcoming. Morris was then in Dr. Meigs' Department of Gynecologic Surgery at the Massachusetts General Hospital. Morris was born and initially raised in central China, but returned for schooling to Princeton and to Harvard for his M.D. After finishing medical school, he sailed across the South Pacific as the doctor to the Fahnestock Expedition to collect specimens for the American Museum of Natural History. The ship was wrecked, however, and the crew had to find their own way home. Morris spent the war years in the South Pacific and, after discharge from the Navy, returned to the Massachusetts General Hospital where he trained together with Drs. Ulfelder, Ingersoll, Langdon Parsons, and Somers Sturgis, and he eventually became assistant to Meigs. In 1951, he spent a year with Hans Kottmeier at the Radiumhemmet in Stockholm, learning that radiation therapy offered an acceptable alternative to surgery, particularly in cervical cancer management. For Morris, coming to Yale was an abrupt change from Harvard where gynecology was a separate department related to surgery rather than to obstetrics and where staff members had full surgical training. Morris established gynecologic surgery at Yale and was instrumental in creating a close link with radiation therapy, a symbiosis that has prospered for over forty years and is still a model for the care of the patient with gynecologic malignancy. The standards of excellence and accountability he established are recalled by generations of still trembling gynecologic residents. He was responsible with Chu Chang for developing a radium system for treating cancer of the cervix. With Meigs he described the distinction between
resectable and non-resectable cancer of the cervix, that is, Stages IIA and IIB. With Robert Scully, he described testicular feminization and, based on the original work of Gertrude van Wagenen, he helped to develop the morning-after pill thereby fulfilling a deep interest in population control. John Morris became Emeritus in 1985 and died in April 1993.

Charles Lee Buxton (1904–1969) [33] succeeded Thoms as Chairman in 1954 (Figure 15). Buxton was born in Superior, Wisconsin, October 14, 1904. He sustained a spinal injury in preparatory school and following 10 operations in 18 months: "I got the idea I definitely wanted to be a doctor" [34].

Buxton was an undergraduate at Princeton and obtained the M.D. from Columbia in 1932. Subsequently, in 1940 he obtained the Med. Sc.D. After an internship in Cooperstown and research at Harvard from 1933–1934, he did his residency at the Sloan Hospital, New York, and at Columbia. He was invited to the Chair at Yale in 1953 at a salary of $22,000 a year. Buxton was what would now be called a reproductive surgeon. He was interested in infertility and did significant research in the field, both endocrinological and surgical. The Buxton clamp to control hemorrhage during myomectomy is still in frequent use. His greatest contribution, however, was as a visionary who recognized good ideas which had potential. He then sought people with expertise to develop those ideas. He attracted individuals who developed research programs in endocrinology, fetal monitoring, and diagnostic ultrasound, and he gave them the opportunity to enhance these fields. This was the beginning of the subspecialty sections at Yale.

Some of the endocrinologists [35] initially nurtured by Lee Buxton include Walter Herrmann, who trained in Switzerland, came as endocrinologist to Yale, and went on to become Chairman first in Seattle and then in Geneva where he succeeded Professor De Watteville. Then there was Raymond Van de Wiele, who trained in Belgium, and went on to become the endocrinologist at Columbia. Both were pioneers in the investigation of the

Figure 15. Charles Lee Buxton, Professor of Obstetrics and Gynecology 1954–1967.
steroid physiology of the ovary. Luigi Mastroianni grew up in New Haven where both his parents were physicians. He went to Yale College and obtained his M.D. at Boston University. Following residency at Metropolitan Hospital in New York, he worked with John Rock at Harvard. He came to Yale as assistant professor in 1954 and investigated the physiology of the fallopian tube using monkeys. He is still recognized as a leading expert on tubal pathophysiology. He became an endocrinologist at the University of Pennsylvania and then its distinguished Chairman for twenty-five years. Nathan Kase trained at Mount Sinai Medical School and the Worcester Foundation. At Yale he became an early expert on steroid aromatization. Kase is recognized as an outstanding clinical teacher and has the particular gift of "bringing the steroid nucleus to life." He became Chairman at Yale for ten years from 1969–1978, and then moved to Mount Sinai in New York first as Chairman of Obstetrics and Gynecology and then became Dean of that medical school. These are the endocrinologists nurtured by Dr. Buxton. All went on to lead major departments in gynecologic endocrinology.

In perinatology there was Edward Hon [36] (Figure 16). He was born in Canton, China on January 12, 1917. He moved with his family to Australia, where, after consistently being first in high school, he graduated from the Marconi School of Wireless in Sydney. He was licensed to operate radio transmitters and became an associate member of the Radio Engineers of Australia in 1942. He was engaged in radio apparatus design for the Australian Armed Forces. He came to the United States to train as a medical missionary. He attended Union College, Lincoln Nebraska and then Loma Linda University College of Medical Evangelists, from which he obtained the M.D. degree in 1950, graduating in first place with high honors. He was then a resident in pathology at Loma Linda from 1950–1951 prior to coming to Yale as assistant resident. His residency included a year as an Ortho Research Fellow. Hon joined the faculty as an instructor in 1954, and for a time he worked with John Morris investigating various pregnancy tests. In 1957 with

Figure 16. Edward Hon, in his laboratory for fetal electrocardiography at Yale New Haven Hospital.
Hess, Hon published the first paper, previously mentioned on fetal electrocardiography in Science [31]. He was a Markle Scholar and became Assistant Professor at Yale in 1956. After a visiting professorship in Sydney, Australia, Hon returned to Loma Linda in 1960 as Professor and Director of Research where he worked on fetal electrocardiography. In 1964 Buxton persuaded Hon to return to Yale to develop a perinatal research center and to evaluate fetal distress by electronic techniques. Hon had been intensively investigating fetal electrocardiography since his 1957 publication. A meticulous and conscientious scientist, he would not permit the clinical application of electrocardiography until there was no doubt that a true record of the event was being recorded. His classification of fetal electrocardiography is now a classic, and the application of the procedure is standard practice. Hon has been widely honored, not only by his alma mater, but also by the Distinguished Service Medal of the Society of Gynecologic Investigation.

Diagnostic ultrasound was the other technique that Buxton saw would provide innovative information for obstetrics and gynecology. He had visited Ian Donald's ultrasound unit in Glasgow, and he had close contact with William Nixon at University College Hospital because, like Thoms before him, he was deeply interested in the Natural Childbirth Program. Norman Smythe at University College Hospital was developing a transmission ultrasound camera at that time. Ernest Kohorn was recruited by Nixon and Buxton to go to Glasgow to learn the new technique and then to bring it to Yale while on a year's fellowship. These were the early days of diagnostic ultrasound and the appearance of the placenta was just being investigated. Kohorn recently recalled taking patients to the operating room with Ian Donald so that the uterus could be explored manually after delivery with the placenta still attached while an ultrasound examination was being performed so as to learn to recognize the ultrasound characteristics of the placenta (Figure 17).

When Kohorn arrived in New Haven only a linear ultrasound scanner was available, and, with that, the first critical evaluation of fetal head size was performed first using a

![Figure 17. Sonogram of the placenta taken in Glasgow in 1964 by Ernest Kohorn while Professor Ian Donald was performing a manual exploration of the uterus so that the ultrasound characteristics of the placenta could be recognized. A = anterior abdominal wall. P = placenta.](image-url)
skull donated by Edmund Crelin in water baths and then on the fetus. Neither the nature of the midline echo nor that of the pulsatile M echo was known at the time. John Hobbins was chief resident and arranged for access to neonates in whom EEG's were performed to determine whether there was detectable change with ultrasound possibly signifying harm.

Kohorn returned to London where, with Blackwell, he described the ultrasound characteristics of hydatidiform mole and, with Stewart Campbell, was the first to demonstrate the posterior lying placenta. Kohorn returned to Yale in 1968 and established the first diagnostic ultrasound unit in New England.

Lee Buxton was also a social activist; he was called the "gentle crusader." He never regarded his important role in reforming the law against contraception as any type of crusade. He was a deeply humane man concerned for people who believed that one should be permitted to make one's own decision in the area of controlling reproduction. It is interesting that a physician concerned with reproductive failure should also concern himself with reproductive control, and it is this concern that made Buxton into the complete and caring doctor he exemplified.

Since 1879 there had been a Connecticut statute devised by an anti-vice crusader, Anthony Comstock, prohibiting the use of contraception in the State of Connecticut. It did not regulate their manufacture or sale only their use. The stated purpose of the law was to prevent illicit sexual relations. However, the law forbade public clinics to offer advice on contraception. Buxton felt that this law was discriminatory against the poor and underprivileged. There was no problem with a private patient obtaining birth control advice and contraception from a private physician. As early as 1960 Buxton sought to reverse this law. He argued that he was being deprived of the liberty to practice his profession in accordance with accepted medical principles.

In 1960 the issue was brought to the Connecticut Supreme Court of Errors to test the constitutionality of the statute. The movement was orchestrated by Fowler V. Harper, Baldwin Professor of Law at Yale. The Connecticut court unanimously upheld the law, Chief Justice Raymond Baldwin claiming that "courts cannot write legislation by judicial decree" and this is particularly so when the legislature has refused to rewrite the existing legislation.

The contraceptive issue had been brought to the Connecticut Supreme Court twice before. In 1940 there was a criminal suit, and the court decided that the wording of the law was clear in not permitting doctors to prescribe contraceptives. The second case in 1942 was initiated by Professor Wilder Tileston of the Yale Medical School, and the court upheld the constitutionality of the law.

Petitions to revise the statute had been brought in many sessions of the General Assembly, but no bill had been passed mainly because of a well-organized opposition.

The issue was brought to a head when Lee Buxton and Estelle Griswold, Executive Director of the Planned Parenthood League of Connecticut, opened a birth control clinic on November 1, 1961. Both were arrested. Buxton later remarked that he thought he was worth more than the $100 demanded for his bail. Both were fined.

The appeal reached the Supreme Court of the United States in October 1965, and the law was overturned. Justice Douglas delivered the majority opinion of the court and Justices Goldberg, Brennan, and the Chief Justice concurred.

Dr. Buxton's efforts effectively liberated the dissemination of information and means for birth control in the state. Rightly he was honored with the admiration and respect of his peers, the receipt of the Lasker Award for outstanding accomplishments in the field of population control, the Ortho Award of the American Fertility Society, and the receipt of a Silver Bowl from the Planned Parenthood League of Connecticut.

Following his Supreme Court victory Buxton fell into ill health and retired from the
Chair at Yale. He continued writing, served on the Medical Committee of Planned Parenthood World Population and the Maternal and Child Health Section of the World Health Organization in Geneva to develop a curriculum for reproductive physiology in medical schools and in developing countries. He died quite suddenly in 1969.

Lee Buxton had great personal charm and was a genial and attentive host. Many remember with affection the Sunday morning brunches he gave to the young members of the staff. He left the Department prepared for subspecialization and ready to absorb the knowledge explosion of the last quarter of the 20th Century.

CONCLUSION

These biographies reflect some of the history of gynecology and obstetrics at Yale; a brilliant beginning, a significant lull, and then again accelerating progress that has been carried through to the present. There was positive activity when the University validated and encouraged the incumbent chairperson. There appeared to be inactivity when lack of leadership was tolerated. Clearly, Smith's leadership had the support of the University. Thoms and Buxton were not only innovators, but also lived in a time of academic financial prosperity. Both academic and financial support appear to be necessary for a department to succeed in achieving its teaching and research objectives.

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