

OUR OBSTETRIC HERITAGE
THE STORY OF SAFE CHILDBIRTH

by

HERBERT THOMS, M.D.

Professor Emeritus Obstetrics and Gynecology
Curator Yale Medical Memorabilia
Yale University

THE SHOE STRING PRESS, INC.

HAMDEN, CONNECTICUT

1960

©HERBERT THOMS, M.D.

All Rights Reserved

Printed in the United States of America

Russell
T. S.
Biology
Library

To
MARGARET ALISON THOMS

TABLE OF CONTENTS

Introduction	xi
Chapter I. The Long Road	1
Chapter II. The With-Women	10
Chapter III. The Renaissance of Obstetrics	21
Chapter IV. The Science of Obstetrics	27
Chapter V. The Chamberlens and the Obstetrical Forceps	33
Chapter VI. The 18th Century, The Great Teachers.....	53
Chapter VII. Cesarean Section, The Greatest Operation	79
Chapter VIII. The Fight for Obstetric Anesthesia	87
Chapter IX. The Conquest of Childbed Fever	100
Chapter X. Some Important Discoveries	117
Chapter XI. The 19th Century, The American Heritage	124
Chapter XII. History in the Making	144
Bibliography	151
Index of Names	159

LIST OF ILLUSTRATIONS

Egyptian Temple of Kom-Ombo	2
Seventeenth Century German Birth Stool	6
Title page of the <i>Rosegarten</i> by Rösslin, 1500	9
Anne Hutchinson, 1590?-1643	12
Title page from 1725 edition of Henrik van Deventer's <i>Novem Lumen</i>	26
The Bony Pelvis from van Deventer's <i>Novem Lumen</i>	28
Obstetrical Forceps (Fig. 4)	47
Title page, William Giffard's <i>Cases in Midwifry</i>	49
Giffard's Extractor and the one "improved" by Mr. Freke	51
Dr. William Smellie, 1697-1763	54
From William Smellie's <i>A Treatise of the Theory and Practice of Midwifery</i>	58
William Shippen, 1736-1808	68
Title page, Samuel Bard's <i>A Compendium of the Theory and Practice of Midwifery</i>	72
Illustration from <i>La Commare</i> depicting Caesarean Section	78
Sir James Young Simpson, 1811-1870	88
Walter Channing, 1786-1876	94
Nathan Cooley Keep, 1800-1875	96
Oliver Wendell Holmes in 1850	108
John Whitridge Williams, 1866-1931	142

INTRODUCTION

This book is about the men and women, ideas and events behind the satisfaction of childbirth today. It is written for all who wish to know more about the past and its relation to the present development of obstetrics. It is written for a wide audience and for this reason technical language and medical details are mostly omitted. In the final chapters the emphasis is placed chiefly on American obstetrics. It is from the teachings of American obstetricians that we derive the greater part of our heritage. American medicine is not English or French or German medicine. It is something of them all and much more, and it is home grown.

The principles of obstetrics are taught to a greater extent today than ever before, not only to an increased number of students in medical and nursing schools, but to a growing host of women and men who are attending childbirth-preparation classes. To these must be added those who attend courses on human reproduction given by colleges, public health groups, and others. Teaching expectant parents has its own problems, for it often finds itself in new and perhaps strange environments: schoolrooms and doctors' offices, dispensaries and church parlors.

The history of the development of modern obstetrics is a logical part of such teaching. It is of high inspiration and the narrative is an exciting one. Medicine has historical resources beyond those of all other disciplines except religion. For centuries physicians have recorded their observations and discoveries chiefly for the profit of succeeding genera-

tions of doctors. This ideal of service was expressed in the writings of Hippocrates as long ago as the 4th century B.C.

Man's interest in his own origin comes from the potency of his biological urge, one of the great forces which give character to civilization, the established order which is dedicated entirely to the future. Any attempt to penetrate the future depends on knowing something of the past and seeking out its meaning. We cannot hope to understand the present without a knowledge of the past.

A letter from the eminent historian of British obstetrics, Professor R. W. Johnstone, refers to "studies of medical worthies, how they become alive in one's own thoughts and command one's respect and, as in the case of William Smellie, one's warm affection." It is indeed true, and it also expresses the hope of every historian that through his effort the reader can share his own companionship with the past.

HERBERT THOMS

CHAPTER ONE

THE LONG ROAD

The long road of obstetric history begins in the child-birth practices of prehistoric people. These we cannot know directly, but their customs probably did not differ too much from those of primitive people today. Anthropologists tell us that the primitive mind is of fairly uniform character and that the fundamental instincts of man are remarkably alike under various conditions of time and place.

The primitive mind, like that of the child, is unable to relate effect to a proper cause. Events are simply isolated phenomena and their explanation is usually assigned to some other coexistent but unrelated phenomena. To primitive people the world is one of mystery and terror. The manifestations of nature seem bent upon destruction and evil spirits exist almost everywhere. Sickness is a malevolence of these spirits which calls for placation, usually accomplished by a leader who may be both priest and medicine man. This combination of priest and physician extends down to our own era. In colonial America, for example, many of our early ministers practiced what Cotton Mather called the "fine conjunction of physic and divinity."

As primitive man continued to exist he developed certain talents for keeping alive by hunting, fishing, and providing shelter for himself. It was inevitable that along



SECTION OF A WALL — EGYPTIAN TEMPLE OF KOM-OMBO
Representations of the Queen in labor and various
instruments presumably obstetrical.

Photograph made in 1945 by Dr. Stuart Stevenson

with these he should seek to relieve pain by bone-setting, wound closing, and assisting in childbirth. In childbirth the cord had to be cut, the afterbirth expressed or withdrawn, and the infant cleansed. For the mother and the father the interval between sexual mating and delivery was too great to suggest any relationship. The only thing the mother could have surmised was that the child which had left her body must in some way previously have entered it.

The fact that primitive races are usually of homogeneous stock would favor a normal delivery and one of short duration. Intermarriage, which seldom exists in primitive societies, often creates labor difficulties because of a disproportion in size between the child's head and the mother's pelvis. Some primitive races are constitutionally large and some small. Their intermarriage as civilization has advanced has been one reason why labor difficulties have to some extent increased. Another reason is that man living under some artificial conditions is prone to rickets. In the female child this may eventuate in pelvic deformity when she attains adulthood. But primitive women were not immune to other childbirth dangers, for infection, hemorrhage, and pregnancy complications undoubtedly attended them as they do women in backward societies today.

The earliest cultures of which we have any written record are those of Mesopotamia and Egypt. Medical records which have come down to us from these sources have but little interest for modern medicine, being bound up in superstition, sorcery, and religious practices. In Egypt the prevention of conception and the induction of abortion were severely punished. There is evidence also that the Egyptians were interested in sterility, the diagnosis of pregnancy, and menstrual disorders.

2
A richer source of material comes to us from the ancient Hebrews, whose recorded racial experiences in the Pentateuch and Talmud are in fact a great part of the root system of our own civilization. In these writings we find strict regulation of sex hygiene and childbirth practices and also for the first time a clear distinction between the priest and the physician.

In the Old Testament are various passages relating to the pains of labor and to premature birth, also to methods for caring for the newborn child and the mother after her delivery. In Genesis 38: 27-30, we read of a twin delivery in which the midwife tied a scarlet thread around the protruding arm of a child, which was withdrawn, so that the other twin was the first to be born. We also learn that Hebrew women often are "lively and are delivered ere the midwives come to them."

From India the earliest writings tell us that physicians often delivered women in normal labor, midwives being present to give aid and instruction to the mother. In early Chinese and Japanese times the midwife system prevailed almost exclusively, which makes the story of the early cultures much the same as far as childbirth is concerned. It is surprising that in the extraordinary culture of ancient Greece so little is written about obstetrics. The great Hippocrates referred to obstetrics, but he probably was not engaged in its practice. According to one authority he was the first to adopt the expediency of saving the mother at the expense of the child.

The only real, important guide to obstetrics which has been preserved from ancient times is the work of the physician Soranus, who practised in Rome at the time of Trajan and Hadrian, A.D. 98-138. His work on diseases of women shows him to be the outstanding figure in obstetrics of his day

and indeed the greatest obstetrician of antiquity. He was born in Ephesus, probably in the second half of the first century. Like so many Greek physicians he went to Rome, where he practised in the early second century. Soranus was the author of nearly twenty medical works, but it is his *Gynecology* which is the most important. How keen an observer he was is seen in this excerpt from his writings. Speaking of the uterus he says:

It has a sympathetic connection with the breasts for when it grows large the breasts also swell simultaneously (in pregnancy) and although it brings the seed to perfection yet the breasts prepare milk for nourishment of the offspring when born, and when the menses flow freely the milk dries up, while as long as the milk comes freely the discharge does not appear, so also in those past their prime, when the uterus grows smaller the mammae likewise waste away and when the embryo is diseased their size is reduced; in fact, when in the pregnant we see the breasts fall away and contract, we anticipate there will be a miscarriage.

Soranus employed and described the birth stool, which is not again referred to in the literature until the 16th century. Soranus was the first to write extensively on the care of the newborn and on the diseases of childhood. In the former instance he gives the midwife the minutest details about cleansing the baby's body, the care of the ears, nose and eyes, the regulation of breast feeding, and the employment of a wet nurse when needed. How really modern Soranus was is seen in the following:

If, however, the newborn cries constantly after nursing, the wet-nurse should hold it in her arms, and soothe its wailing by patting, babbling, and making gentle sounds, without, however, in addition fright-



SEVENTEENTH CENTURY GERMAN BIRTH STOOL

ening or disquieting it by loud noises or other threats. *For fright arising from such things becomes the cause of afflictions, sometimes of the body, sometimes of the soul.*

Of the fitness of the midwife, Soranus says: "She must love work in order to persevere through all vicissitudes . . . she will be unperturbed, unafraid in danger, able to state clearly the reasons for her measures, she will bring assurance to her patients, and be sympathetic."

Those who wish to become better acquainted with this great and good doctor of ancient times can do so by reading a recent translation, by Owsei Temkin, of his *Gynecology*, which is a storehouse of information and delightful reading.

It is a long jump from Soranus to the 16th century, but it was in this and the following century that the real transition from medieval to modern obstetrical thinking took place. Obstetrics in these latter years also had its own renaissance into a medical science, shedding much of its incrustation of superstition, ignorance, and bigotry. The dawn of this new era was marked by a series of books written for the instruction of midwives. The earliest now extant is called the *Little Book for Women* and was written by Ortolff von Bayerland, a physician of Wurzburg in the middle of the 15th century. There are but thirteen pages in the *Little Book*, but within is found sound advice for the midwife and the mother. Thus: "Every woman who can do it should in time provide herself with an experienced midwife, one with gentle hands, a fearless and not too talkative one."

Another small but significant book for midwives and mothers, published in 1500, is known today as the *Rosegarten*, the title in translation reading *A Rosegarden for Pregnant Women and Midwives*. This is said to be a play on the author's name, *Rösslin*, "little rose." Little is known about Eucharius Rösslin, but the work was written at Worms and published at Strassburg. Many translations and revisions of the *Rosegarten* were made and for two centuries they served as works of authority for the medical profession on the Continent and also in England. However, the book shows little originality, for it is largely a compilation from Hippocrates, Galen, and others. The illustrations also came from outside sources, some from Soranus.

Rosgarten

Das vierd Capitel sagt wie sich ein yede fraw/in/vor/vnd nach der geburt halten sollt vnd wie man ir in harter geburt zu hilff kommen sollt.



Courtesy of the Yale Medical Library

TITLE PAGE OF THE *Rosgarten* BY ROSSLIN, 1500

The *Rosegarten* appeared in English in 1540 and was published by a well known printer, Thomas Raynalde, under the title *The Byrth of Mankynde*. It was dedicated to the “most excellent vertuous Lady Quene Katheryne” Howard, then wife of Henry VIII. Historically the *Rosegarten* and its translations are of significance because they aroused interest in the better training of midwives. Beyond this they added nothing to obstetrics not already known.

CHAPTER TWO

THE WITH - WOMEN

The term *midwife* comes from the English *Mid-Wif*, or *With-Woman*. Early in our colonial history the midwife occupied an important part in community life. All of the earliest midwives were trained abroad and were held in high esteem. Thus, in the New Haven Colony the Widow Bradley in 1655 was furnished with a house and lot rent free as long as she continued her services as a midwife. In the colony at Manhattan in 1635 a house was built for Trynte Jonas on Pearl Street, and at a later date Hellegond Joris was voted a salary of 100 guilders a year as a midwife. In Virginia, Goodwife Thorpe had a regular fee of 100 pounds of tobacco for her services. Elizabeth Phillips, who came to Boston in 1719, held a commission as a midwife granted by the Bishop of London. She lived to be seventy-six and according to her epitaph at Charlestown delivered more than 3,000 children. One of the most celebrated and beloved midwives in the New Haven Colony was Mrs. Elizabeth Smithson of Guilford, who was the mother-in-law of the great cleric-physician Jared Eliot. At her death at the age of eighty-six he preached a funeral sermon, afterwards published, in which he declared: "She knew when to exert herself vigourously and also when it was her strength to sit still," sound obstetric doctrine then and now.

One of the best accounts of the colonial midwife is seen in the famous diary of Judge Samuel Sewell of Boston, which was kept by him over a fifty-five year period beginning two years after his graduation from Harvard College in 1671. Under the date of April 1, 1677, he records:

About Two of the Clock at night I waked and perceived my wife ill: asked to call her mother. She said I should goe to prayer, then she would tell me. Then I rose, lighted a candle at Father's fire, that had been raked up from Saturday night, kindled a Fire in the chamber, and after 5 our folks up, went and gave Mother Warning. She came and had me call the Midwife, Goodwife Weeden, which I did. But my wives pain went away in great measure after she was up; toward midnight came on again, and about quarter of an hour after ten at night Father and I sitting in the Great Hall, heard the child cry, whereas we were afraid 'twould have been 12 before she would have been brought to bed. Went home with the Midwife about 2 o'clock, carrying her stool, whose parts were included in a Bagg. Met with the Watch at Mr. Rocks Brew house, who bad us stand, enquired what we were. I told the woman's occupation, so they bad God bless our labours, and let us pass. The first woman the child sucked was Bridget Davenport. *April 3* Cousin Flint came to us. She said we ought to lay scarlet on the Child's head for it had received some harm. Nurse Hood watches. *April 7*. Saturday, first laboured the child to suck his mother, which he scarce did at all. In the afternoon my wife set up, and he sucked the right breast bravely.

There is no doubt that there was something of a celebration in the Sewell household, for although the Judge was a



ANNE HUTCHINSON
Statue by Cyrus E. Dallin

staunch Puritan and frowned on any recognition of such days as Christmas and Easter he was not averse to feasting on occasions not associated with Church days. After the birth of another child he records, (January 7, 1701) :

My wife treats her Midwife and women: Had a good Dinner, Boil'd Pork, Beef, Fowle: very good Rost beef, Turkey Pye, Tarts, Madam Usher carv'd, Mrs. Hannah Greenleaf, Ellis, Cowell, Wheeler, Johnson and her daughter Cole, Mrs. Hill our Nurses Mother, Nurse Johnson, Hill, Hawkins, Mrs. Goose, Deming, Green, Smith, Hatch, Blin. Comfortable moderat weather; and with a good fire in the stove warm'd the room.

New England's most celebrated midwife was the still controversial Anne Hutchinson, who with Roger Williams and the Quakers did much to make the Puritans uncomfortable and to reduce a large part of their doctrine to absurdity. Anne and her husband came to Boston from England in 1634. John Cotton said of her: "She did much good in our towns, woman's meetings, Childbirth travels [travails], good discourse about their spiritual states." In spite of this favorable testimony within four years after her arrival she was summoned before the General Court of Massachusetts, excommunicated, and banished, largely for her religious views. About this time too she had the misfortune to deliver her friend Mary Dyer of a stillborn deformed child and because of this she was suspected of being a witch. After her trial she went to Rhode Island and there came into conflict with the governor and his associates. From here she went to Long Island and finally settled in Pelham. Fate had worse in store for her, for during an Indian raid she and her family were murdered, all except a small daughter who was

carried off. The Pelham river carries her name, as does also, in modern times, the Hutchinson River Parkway.

Ironically a statue of Anne Hutchinson stands today in front of the present meeting place of the General Court of Massachusetts, which cast her out so many years ago. A tablet to her memory is placed in the First Church of Boston, and another in Wollaston marks the spot where she started her exodus from Massachusetts Colony.

The real origins of the midwife are lost in the dawn of mankind. Every culture of which we have any record had its midwives. Ancient Egypt had two classes, the ordinary midwives and the physician midwives, the latter being permitted to administer drugs. Some midwives in ancient cultures belonged to a high social order. Aristotle speaks of the wisdom and intelligence of the midwives of Greece. The wife of Pericles practised as a midwife. The mother of Socrates was a midwife. Later on in Germany, France, and England, midwives often had positions of authority and influence and some wrote treatises on obstetrics which were standard for years.

In Germany a maternity hospital was established as early as 1339, and after this date laws were enacted to regulate the practice of midwives. In Germany, too, doctors were permitted to attend women in labor when requested to do so by the midwife. There existed two grades of midwives, the *town midwives* and the *sworn midwives*, the latter being given preference because of their greater skill. Probably the most celebrated of the German midwives was Justine Siegemundin, called "Pious Justine" because of her frequent references to the Deity in her writings. Underneath her portrait in her most important book are the words, "All my doing depends upon God's help and blessing and the

skillful motions of my hands." She was the Court Midwife to the Electorate of Brandenburg and her book, published in 1776, was translated into Dutch and was used in the universities of Germany. She has been called "a lantern bearer in the darkness of ignorance and superstition."

France had a number of women who were famous as midwives. One of these was Louise Bourgeois, born in 1553. She had great distinction as a teacher and author and was the midwife to the Court for twenty-seven years. Her crowning achievement was the delivery of the future Louis XIII; in all, six children of Henry IV were delivered by her. Her career came to an abrupt end when the Duchess D'Orleans died on the third day after delivery, of an infection. She was greatly blamed by the Court doctors in spite of her "apologia," which defended her management of the case.

Another important French midwife was Madame Le Boursier Du Coudray. By permission of Louis XVI she went into the provinces and gave free instruction to the midwives there. For teaching purposes she invented a mannikin, or life-sized model, by which she could demonstrate the position of the baby and the techniques of delivery. The French midwives as a group were highly influential in advancing obstetrics. Many of the more celebrated in the 16th, 17th and 18th centuries were identified with the great hospital at Paris, the Hôtel Dieu. One of these was Marie Duges, who was chief midwife there at the time of the Revolution and gave notable service to the sick and wounded. She was the mother of the famous midwife, Louise La Chapelle, born in 1769.

In England there were royal midwives up to the time of Queen Victoria, some of whom had great influence at Court. One such was Mrs. Margaret Stevens, who delivered

Queen Charlotte in her confinements and wrote a commendable treatise called *The Domestic Midwife*. She even instructed midwives in the use of obstetrical instruments, including the forceps, which she regarded as a life-saving instrument. As will be seen later, it was introduction of the forceps which revolutionized the practice of obstetrics, bringing doctors more and more into the lying-in chamber. It was Peter Chamberlen of the family of forceps fame who proposed to James I in 1616: "That some order may be settled by the State for the instruction and civil government of the midwives." His son also became a champion of this cause and was prominent as Physician-in-Ordinary to three kings and queens of England. More about these two Chamberlens later.

Alice Dennis, the royal midwife who attended Anne of Denmark, Queen of James I, was given £100 for her services, but this was small potatoes compared to the cost of preparation and the accoutrements of the royal birth: "The Queen's childbed and other necessary provisions for that time, £52,542."

Jane Sharp was the first English midwife to write a book on midwifery. This bore the title, *The Midwives Book, or the whole art of Midwifery discovered; directing child-bearing women how to behave themselves*. (1671)

Historically we find conflict between doctors and midwives in almost every country in which the two have come into contact. The attempts of the doctors to regulate the activities of the midwives always resulted in resentment. For years in England the controversy was bitter, and exchanges between these groups were marked by heights (or depths) of invective almost unbelievable. In spite of the attempts of the leaders of both groups to better the practice

of obstetrics the story of childbirth practically down to our own time has many sad chapters. Before the advent of anesthesia and the triumph over puerperal infection the helplessness of attendants in childbirth was often pitiable indeed, for often disaster was inevitable from the start.

To conclude this chapter on the midwives, something might be said about their status in our own time. The midwife systems in most European countries today are of a high order. They serve a function which is important and necessary. In Great Britain, France, and the Scandinavian countries the educational requirements for midwife certification in many ways rivals that for the physician. In England the system is represented in all university hospitals, where midwives carry out important duties in the instruction of nurses and medical students. There they are known as "sisters," a happy designation.

When many people think about midwives in America they think of those women who practised extensively in our large cities up to a few years ago. They also think of the negro midwives who have served their people for so long a time in the South. The city midwife has disappeared, the increased hospitalization for women in childbirth being a major factor in her departure.

In 1931-32 two things happened which have significance in the history of the midwife in America. The first event was a call by Dr. Benjamin P. Watson, Professor of Obstetrics and Gynecology at Columbia University, at the New York Academy of Medicine, in which he said, "I would like to see every obstetrical hospital with a staff of trained midwives." Dr. Watson better than anyone in America at that time knew the midwife situation in Great Britain, for previously he had been Professor of Midwifery at Edinburgh. ←

At that time he further stated: "A nurse can become just as expert in conducting a normal delivery as can a technician in doing a blood count or a blood chemistry . . . This is a great opportunity to graft on our present practice all of the best features of the type of midwife practice abroad."

The other event was the opening in New York in September, 1932, of the first school for nurse-midwives in the United States. This was the School of the Association for the Promotion and Standardization of Midwifery, Inc. In 1935 the Maternity Center Association of New York assumed the administrative responsibility of the school. In 1955 the Association reported on a twenty-year experience in training nurse-midwives. Over this period 231 students had graduated as nurse-midwives. Some idea of the type of women interested in preparing for such a career is seen by the fact that of these 231 graduates, 43 had masters' degrees on admission to the school, 110 had bachelors' degrees, and 42 had at least two years of college work.

These graduate nurse-midwives have literally blazed new trails in this country in state health departments, public health agencies, and state maternity programs. Some have aided in establishing nurse-midwifery schools in the South. It is a matter of record that no graduate of the school has ever entered private practice as a midwife. Students have come to the school from the world's four corners, often returning to open up areas to better obstetrics and in some instances to carry on their work sometimes under conditions almost inconceivable.

In its original conception the nurse-midwife is a British institution. Modern nursing is said to have started in 1860, when Florence Nightingale established a training school for nurses at St. Thomas' Hospital, London. Not many are aware

that this great lady was specially interested in midwifery and even wrote a book on the subject. It was one of her nurses, Rosalind Paget, later Dame Rosalind, who was a leading spirit in founding the Midwives Institute in 1881. Miss Paget became the first *Queen's Nurse*. One of the important influences of British nurse-midwifery has been the raising of the standard of obstetrics even in such places as the Outer Hebrides, where as part of the Highlands and Islands Medical and Nursing Service nurse-midwives have made history under conditions calling for frequent trial and hardship. This contribution in Northern Scotland is significant for us, for out of it came a like development in our Kentucky mountains, the Frontier Nursing Service, established and directed these many years by one of our own great women, Mary Breckinridge, nurse-midwife. Her book *Wide Neighborhoods* is a saga of nurse-midwifery in rural America and of one woman's devotion to a noble cause.

Within the past few years other things have been happening which may prove to be an answer to Dr. Watson's plea for the nurse-midwife as an active part of a professional team in hospital obstetrics. In 1948 when the Preparation for Childbirth Program was being inaugurated at the Yale School of Medicine two nurse-midwives from the Maternity Center Association were added to the nursing staff and in addition a graduate physician fellow was added to work with them. All three were supported over a two year period by the Association. This "team" was integrated with the regular and undergraduate teaching program of the School of Medicine and the School of Nursing. So successful was this experiment that the use of nurse-midwives in nursing education and other instruction has continued at the Schools.

Another important experiment was carried out by Dr.

N. J. Eastman at the Johns Hopkins Hospital. Here nurse-midwives trained at the Maternity Center Association were used to train other nurses known as Obstetric Assistants. With these assistants the nurse-midwives assumed the complete care of the women who were assigned to them, including the delivery and after-care. Medical consultation and supervision was always available if needed. Dr. Eastman writes: "I have watched all this with my own eyes and am convinced that the meticulous type of care they give is the answer to the greatest weakness in American Obstetrics, lack of emotional support both in pregnancy and labor."

A most practical suggestion comes from Sister Theophane Shoemaker, a nurse-midwife who is Director of the Catholic Maternity Institute at Santa Fe, New Mexico. She believes that every hospital with an obstetric department could use at least four certified nurse-midwives, one to teach parents, the other three to attend mothers in labor, one in each of the eight-hour work periods.

The problem that faces American Obstetrics today is that about five million mothers are going to have babies in the coming year, the vast majority being delivered in hospitals. All of them deserve efficient and sympathetic care, for without a personalized type of care the start of family life is too often not what it should be. We must not settle for second class obstetrics any more than we would for second class medical care of any kind. The use of the nurse-midwife as a part of the hospital professional team or the nurse specially trained to be an "obstetric assistant" more and more is the best answer and probably the only one. But we must see that the hands of these women are free and not tied by tradition and prejudice.

CHAPTER THREE

THE RENAISSANCE OF OBSTETRICS

It was not until the middle of the 16th century that obstetrics moved toward the rank of a medical science. It was at this time that the surgeons, in contrast to the physicians, began to cooperate with the midwives in complicated cases. The pivotal figure in this development was Ambroise Paré, later referred to by the master obstetrician William Smellie as "the famous restorer and improver of midwifery." Paré is regarded today as one of the great surgeons of all time, for it was he who reintroduced the ligature to control bleeding in place of the hot iron and burning oil. He also invented many surgical instruments, introduced massage, artificial limbs, and even artificial eyes (of gold and silver). According to Dr. Howard A. Kelly, he was the first to recognize that flies could be transmitters of disease. Paré's great contribution to obstetrics was the operation of turning the baby in the womb, or version, as a practical procedure in complicated cases. It was from his time on that surgeons began to consider obstetrics suitable to their dignity, and as a result they began more and more to encroach upon the functions of the midwife.

The story of Ambroise Paré's life has all the elements of a historic romance. He was born near Laval in France about 1510, trained as a barber-surgeon, at that time the low-

liest of the medical practitioners. By 1533 he was in Paris as a house-surgeon at the Hôtel Dieu, and three or four years later he set up in Paris the practice which he pursued between army duties for the next thirty years. For a considerable part of this time, however, he followed an active career as an army surgeon. Stephen Paget says:

When Paré joined the army he went simply as a follower of Colonel Montejan having neither rank, recognition, or regular payment. His fees make up in romance for their irregularity: a cask of wine, fifty double ducats and a horse, a diamond, a collection of crowns and half-crowns from the ranks; from the King himself three hundred crowns and a promise he would never be in want; another diamond, this time from the finger of a duchess; and a soldier once offered a bag of gold to him.

It was in the army that Paré became by sheer courage and ability the greatest surgeon of his time. Even so, he was snubbed by the medical bigwigs of his day because he wrote in his own language instead of Latin. However, he was greatly beloved by his army comrades, and it is recorded that he was the only Protestant to be spared by royal mandate at the massacre of St. Bartholomew.

As a person of vigor and charm Ambroise Paré is best seen in his *Journeys in Diverse Places, 1537-1569* (Harvard Classics), which gives a vivid picture of military life in his time. He wrote the book at the age of seventy in reply to an attack by the Dean of the Faculty of Medicine because of his use of the ligature instead of the cautery. Paré's famous aphorism, *Je le pansay, Dieu le Guarit*, "I dressed him, God healed him," is inscribed upon his statue. He died in 1590.

The first of the important Italian writers for midwives was Scipione Mercurio, born in 1540 in Rome. During his early period he wavered between theology and medicine and for a period resided in a Dominican monastery at Milan. He studied at Bologna under Arantius, and he records that this learned anatomist had performed many dissections of women who had died in pregnancy or childbirth. He practised medicine at Padua and Milan and seems to have specialized in obstetrics. During the last fifteen years of Mercurio's life he lived in Venice, where he died in 1616. His chief obstetrical work was first published in 1596 and divided into three books, the first dealing with natural labor, care of the pregnant woman and the newborn child. The second takes up abnormal presentations and their management, and the third deals with various maladies which may occur in pregnancy. In Mercurio's work we find the first mention of pelvic deformity as an indication for cesarean section. He was the first to introduce the operation into Italy and to publish an illustration of the procedure. Two chapters are devoted to the operation, of which he says: "When the foetus is extraordinarily strong, the passage narrow, the pubic bone flat, it is more than necessary to perform this operation because of there is no other way out," and again, "Not every surgeon is fitted to effect Caesarean delivery; but the one who [is so fitted is a surgeon who] has had experience, is brave, is prudent, and above everything else is a skilled anatomist."

For 125 years Mercurio's work on obstetrics held an authoritative position in Italy and Germany. It was the outstanding contribution of Italian obstetrics in the 16th and 17th centuries.

Jacques Guillemeau was the pupil and son-in-law of

Ambroise Paré. He did not have his master's genius, but he did great service to obstetrics in carrying out Paré's methods, especially the art of version, which he described in detail and in some ways perfected. He was surgeon to King Charles IX, Henry III, and Henry IV. Guillemeau also wrote on surgical subjects and in 1585 published what has been called the best of the Renaissance books on Ophthalmology. In 1609 appeared his *Happy Deliveries of Women*, which made a strong appeal for better obstetrical training of the medical profession. Guillemeau was followed in France by a succession of obstetricians, including Mauriceau, Portal, and Peu, who greatly aided the development of obstetrics in that country.

In England it was not until the middle of the 17th century that any important obstetrical contributions appeared, but at that time the work of the Chamberlens and of William Harvey more than made up for previous lack of progress. The Chamberlens are dealt with in a later chapter. William Harvey laid the foundation for the study of human embryology and was a pioneer in establishing sound principles in the conduct of labor. It is of considerable historic interest that obstetrics should have such vital claims on the work of two such great figures as Paré and Harvey. Their contributions to other medical fields have tended to obscure their importance in obstetrical science.

William Harvey was born in 1578 and was educated at Cambridge. He received his M.D. degree at the University of Padua. After his return to England he became physician to St. Bartholomew's Hospital and Lumleian Lecturer at the College of Physicians. It was in this latter capacity that in 1616 he announced his famous theories on the circulation of the blood. Two years later he became physician extraor-

dinary to James I, and later by mandate of Charles I he was made Warden of Merton College, Oxford. He died in 1657.

Harvey's great contribution to obstetrics was his *De generatione animalium* (1652). For years he studied the development of the chick in the egg and also made many dissections of the human embryo as he says: "from the bigness of a tadpole and so upwards to the birth." An important conclusion of his reads: "The same theories and conclusions, though they may appear paradoxical, which we draw from the history of the egg, turn out to be equally true to the generation of animals in general."

William Harvey was a practical and experienced obstetrician. He urged that gentleness and patience are prime necessities in the conduct of normal labor. He condemned the midwives who: "lest they should seem unskillful in their trade, do mightily bestir themselves and provoke the expulsive faculty by medicinal potens."



TITLE PAGE FROM 1725 EDITION OF HENRIK VAN DEVENTER'S
Novum Lumen

From Thoms: *Classical Contributions to Obstetrics and Gynecology*

CHAPTER FOUR

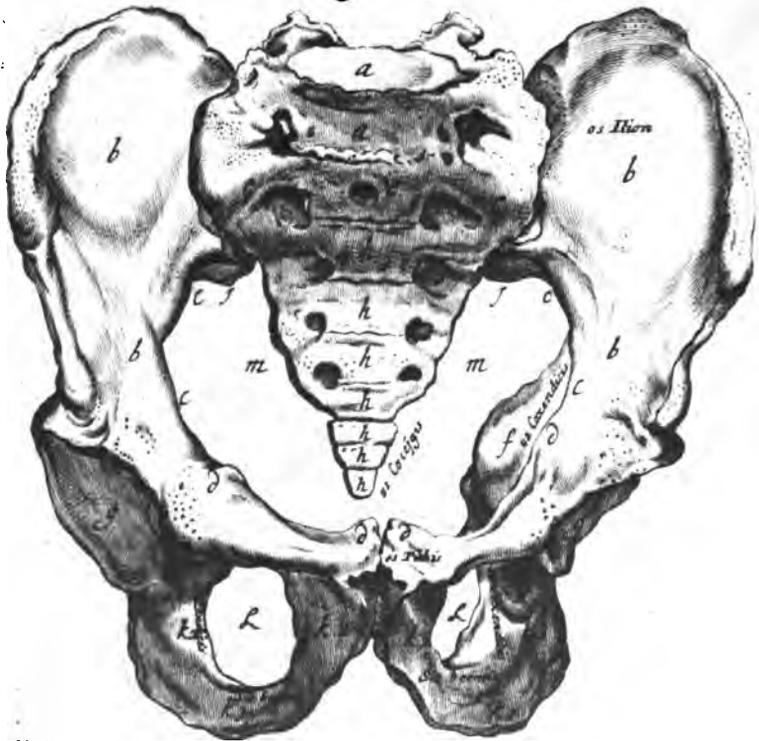
THE SCIENCE OF OBSTETRICS

During the 17th Century obstetrics made advances that were basic and enduring and were in the next century to make possible the careers of giants like the Hunters and William Smellie. The 17th century also saw the establishment of obstetrical teaching by such great medical leaders as Van Deventer in Holland, Mauriceau and de la Motte in France, and the midwife Siegemundin in Germany. The first of these, Henrik van Deventer, was born in The Hague in 1651, studied medicine at Groningen and practiced in his native city. His *New Light for Midwives* (1701) was of such importance that its author has been called the Father of Modern Midwifery. In his work we find the first thorough study of the anatomy of the bony pelvis and the complicating effect of its deformities on labor. So remarkable was his book that it remained authoritative for the next 150 years. Van Deventer's wife was an accomplished midwife and there is no doubt that she assisted him in pointing out the practical needs of her profession.

In 1716 a translation of Van Deventer's work appeared in English as *The Art of Midwifery Improved*. In it the author felt inclined to apologize for considering the subject of pelvic deformity. He says:

As for the necessity for the knowledge of these

Fig: 3



Thi. Bontate fecit.

THE BONY PELVIS FROM VAN DEVENTER'S 1725 EDITION
Novem Lumen

From Thoms: *Classical Contributions to Obstetrics and Gynecology*

bones and their form and figure, I should take no notice of them, had I a mind to follow the method of other writers; or I should but slightly touch upon them so that the midwives would reap but little advantage of it, but thinking the knowledge of these bones to be highly necessary to midwives I thought it necessary also to represent these figures.

Van Deventer distinguished between male and female pelves and said that in the latter the bones are more flexible and yield to the force of the infant as it passes. He did not believe the centuries-old claim that the pubic bones actually separated during labor. He held that more room for the passage of the baby became possible through the backward displacement of the sacrum and coccyx, a fact proven again in our own times. The plates in his book illustrating the bony structures of the deformed pelvis have real interest today. This great obstetrician raised the standards of obstetrical teaching and practice not only in Holland but in neighboring countries on the Continent and across the Channel.

Another leading exponent of obstetrical knowledge in the 17th century was Francois Mauriceau of Paris, born in 1637. He was educated at the great French hospital, the Hôtel Dieu, and practiced with great success in Paris. In 1668 he published his important work on *Diseases of Women in Pregnancy and Childbirth*. This had great influence in France and England, in the latter country appearing in translation as the work of Hugh Chamberlen of forceps fame. Mauriceau's own work with its beautiful copper plates has been called the canon of the art of illustration in its time. Mauriceau was one of the first to use the bed instead of the birth stool for delivery. In his book we also find an account of his adventure with Hugh Chamberlen, about which more later.

This great French obstetrician was highly condemnatory of cesarean section, calling the operation inhuman, cruel and barbarous. He said that any surgeon should be able to deliver any baby dead or alive without sacrificing the mother. "I do not know," he wrote: "that there was ever any law, Christian or civil which doth ordain the martyring and killing the mother to save the child." Naegele called Mauriceau the oracle of the obstetricians of his century. It is certain that his teachings had great influence upon those who came after him in France, especially his celebrated pupils Portal and Peu. One notable heir of his teaching was Manquist de la Motte, a country practitioner in a village of Picardy whom the historian Palmer Findley has called the greatest obstetrician of his day. In 1722, when he was seventy years old, he published his important *Traite Complet des accouchemens*. This was the book which a century later the American obstetrician Theophilus Parvin called "a monument to the industry, the knowledge and skill of a practitioner who for more than half a century in a comparatively obscure part of the country, faithfully toiled, not to get riches or fame, or to secure a place in hospital or college, but for the glory of the Creator and the relief of man's estate."

De la Motte holds our interest because he was inwardly dedicated to study the nature and physiology of childbirth and to use his knowledge as a chief guide to practice. In his writing he says of himself:

As I live at the tip end of province bounded on nearly every side by the sea, and as I usually work in the country, without physicians and surgeons who might aid me with their advice, or who, at least, are very rarely to be found, I have been obliged to conduct myself usually endeavoring to aid na-

ture and to control the accidents which accompany pregnancy and labour, all the more so that good sense and my reflections have furnished me with the means, without submitting me too much with the authorities, nor rendering me a slave to the customs generally received, unless I recognise the necessity of conforming myself to them on account of the disease, the constitution of the patients, and other circumstances from which one may draw certain considerations.

In spite of Mauriceau, Portal and Peu, de la Motte recognized that certain malformed pelvises might justify cesarean section. He claimed priority in emphasizing the part the pelvic inlet could play in obstructed labour. The historian Fasbender says: "History will record a prominent place for de la Motte in the 'doctrine of the narrow pelvis'."

Van Deventer's important contributions found an exponent in the person of Sir Richard Manningham, who established the first lying-in wards in England in 1739. This was in a house adjoining his own and these wards later became the General Lying-in Hospital, which was the precursor of Queen Charlotte's Hospital. Manningham was the son of the Bishop of Chichester and was born in 1690. He took his bachelor and medical degrees at Cambridge and settled in London. He was knighted in 1721 by George I, at whose command he exposed the notorious case of Mary Tufts, the "rabbit breeder of Godliman." In teaching obstetrics Manningham used a machine or mannikin and his chief method of delivery in difficult cases was by version. He speaks of the "proper instrument" in certain labors but does not mention the forceps by name. He condemned cesarean section in the living woman. Manningham is to be considered as the leading ob-

stetrician or man-midwife of his day in England and the immediate forerunner of the important group there whose contributions to obstetrics were of such major proportions.

CHAPTER FIVE

THE CHAMBERLENS AND THE OBSTETRICAL FORCEPS

The obstetrical forceps has been called the most beneficent surgical instrument of man's invention, saving more lives and alleviating more pain than all the other instruments in the professional armamentarium. By its invention the name of the Chamberlens has become immortal, "though its lustre," says H. R. Spencer: "is tarnished by the secrecy which they maintained in regard to the nature of their invention, and by the boasting and self-seeking of the most conspicuous members, which could not be concealed by a veil of sanctimonious humanitarianism." But another historian protests that:

The Chamberlens have been unmercifully censured for having kept the invention of the midwifery forceps a family secret, but it is not fair to judge members of our profession who lived two hundred years ago, by the code of ethics which medical men now accept. At that time the profession of a nostrum was not looked upon as degrading or derogatory to its owner; and the custom of not publishing secret modes of practice was very common.

From this we surmise that the Chamberlens were no better or worse than their neighbors.

This remarkable family of doctors is complicated genealogically, there being three Peters and two Hughs. The obstetrical forceps in principle is the simplest of instruments, consisting essentially of two enlarged metal spoons with handles which are joined in such a way that the bowls can grasp or cup the baby's head and thus serve to draw it into the world when nature fails in her efforts to push it out. When we consider this simple concept and its application to the problem, it seems incredible that the ancients did not possess some such device for assisting the laboring woman. The fact is that although they used surgical instruments of considerable ingenuity, nothing they had resembles any device which could have been used as forceps on the living fetus. Instruments for removing the baby by mutilating and extracting it are known to have existed as early as 400 B.C., when Hippocrates gave advice concerning their use. Aside from version or turning, which was re-established by Ambroise Pare, the only other procedure used by the early midwives before the time of the Chamberlens was the fillet, a tape which could be passed into the uterus over an arm or leg of the baby and used for traction. Aveling, who wrote on the history of the forceps, believes that beyond a doubt Arabian surgeons used forceps to deliver the head in difficult labor, but for centuries all knowledge of them had been lost and their reinvention became necessary.

The story of the Chamberlens begins with William Chamberlen and his wife Genevieve, who were living in Paris in 1569 and as Huguenots were undergoing all the hardships and indignities to which those of their faith were being exposed. Fortunately for them they sought refuge in England and thus escaped the St. Bartholomew's Day massacres. In July, 1572, the father, mother, and three children, Peter,

Simon, and Jane, arrived in Southampton and on the third day of that month were duly recorded at their first reception of the Lord's Supper in the register of the Church of St. Julian.

There is strong circumstantial evidence that William Chamberlen was a physician and practiced at Southampton. Three years later another son was born, also to be named Peter, to the confusion of future historians. The brothers were known then and now as Peter the Elder and Peter the Younger. They are supposed to have studied medicine under their father; later, when the rest of the family moved to London, Peter the Elder remained at Southampton and was there at the time of the Armada in 1588.

In 1596, after his father's death, Peter the Elder also came to London. By this time his younger brother was a member of the Barber-Surgeons Company, and after a time he also was admitted. Both Chamberlens are recorded as having fallen afoul of the Royal College of Physicians for "giving inward physic without the approbation of the doctor." Later on, in 1612, it is related that "Petrus Chamberlaine, Senior habitans in Marke Lane" found himself again before the College for giving physic and this time he was in trouble indeed, for a warrant was signed and he was removed to Newgate Prison. To understand something of all this it is necessary to recall that at that time physicians might practice surgery but surgeons could not practice physic.

It should be recorded that the brothers Chamberlen had no chance whatever of becoming members of the College, as neither possessed the prime requisite, a doctor's degree from Oxford or Cambridge. Some idea of Peter the Elder's reputation at that time may be judged by the fact that no less a person than the Queen, Anne of Denmark, whom he at-

tended in childbirth, paid his fines and prevailed upon the Archbishop of Canterbury to set him free. In addition she gave him a diamond ring which became an heirloom.

In 1638 this same Peter was surgeon to Henrietta Maria, wife of Charles I, who miscarried of her first child, at which time, when the town midwife of Greenwich had swooned from fear in the royal presence: "Chamberlayne the surgeon was he alone that did the part of midwife." Four years after this Peter the Elder died, having lived in England for seventy years.

Peter the Younger, like his brother, was often in conflict with the powerful College of Physicians. Their annals record that in 1620 he was charged with prescribing an enema and was dismissed with a warning. He also angered them because, following the example of Peter the Elder, he attempted to incorporate the midwives, an effort which gave rise to a situation in which his son was to become highly involved. For us Peter the Younger is more famous as being the father of Peter III. Peter III was born in 1601, and his life as a London physician, if irregular, was certainly adventurous. This Peter's early education was so guided that there would be no question about his academic qualifications for admission to the College. Before his twentieth year he had an M.D. degree from both Oxford and Cambridge as well as one from the University of Padua. He became a fellow of the College in 1628, about the time that his uncle Peter the Elder was attendant upon the wife of Charles I. This Peter, then seventy years old and about to retire, introduced his nephew to the Queen, and Peter III eventually took over the Court appointment. Even at the time of his election to the College he was quite close to Court affairs, and before he was allowed to assume membership he was gravely admonished by the presi-

dent of that body for dressing in the frivolous fashion of the Court. He was not admitted until he had adopted the sober dress of the College members.

In 1634 the midwives of London repeated a petition for incorporation. To the College, however, it appeared that Dr. Chamberlen was planning to have the licensing of them solely invested in himself and it was alleged that he would not assist any midwives who would not go along with this idea. The resulting controversy drew from his pen in 1647 a defense called, *A Voice in Rhama or, The Cries of Women and Children, Echoed forth in the Compassions of Peter Chamberlen, et cetera*. In it he wrote: "Meum and Tuum divide the world into Factions, into Atoms; and till the world returns to its first simplicitie, or (as in the morning of the gospel) to a Christian Utopia, there will be repinings, and Covetousness will be the Root of all Evil." Those who opposed him had spared no invective, and although his injured innocence is considerably overdrawn his reply is a typical example of the literature of controversy of that day.

Peter III's breadth of thinking is best seen in his petition to Parliament for an ordinance granting him the sole making of baths and bathstoves for fourteen years, an ordinance which they eventually passed. He believed that public baths were an important health measure and the words of the ordinance reveal something of the plan. He was to have: "the sole making and erecting of Artificial Baths and Bathstoves with their appurtenances of Cisternes, Waterworks, Engins, Hammaco beds, Hammaco sleds, Hammaco chaires, Hammaco coaches (for the safe and easy setting lying or conveying of weak or sickley persons) within every Cities, townes, . . ." All of this was violently opposed by the College, which through its representatives pointed out that the Greek

and Roman baths had debauched the manners of the people and led to their downfall; also that facilities now existed in private homes for the purpose of obtaining identical benefits, to wit: "Cradles, tubs, boxes, chaires, bathes and bathstoves."

During the long controversy Chamberlen remained away from the meetings of the College and after neglecting a summons he was formally dismissed from the fellowship, November 23, 1649. His next scheme was an expansive Utopian idea set forth in a pamphlet called, *The Poore Man's Advocate or England's Samaritan*. This was a plea for reconciling all political parties, paying all arrears to the army and all public debts, and making a "common joynt Stock of all parish Collections." Beyond this the plan would feed and clothe the poor of all England, including those in jail; also it would give such as were able, work in erecting academies for the education of youth and providing schools and nurseries for little children. These worthy objectives were about three centuries too early for the public to be interested in them. During the period of the Commonwealth Chamberlen rendered himself more unpopular by the promulgation of his religious opinions. He was called Chamberlen the pamphlet-monger. "Should he . . . sell his prayers six pence a dozen, Dine upon Midwife's fees, and grease his chaps with Gossips charity and female scraps."

Upon the accession of Charles II he was appointed Physician in Ordinary. In April 1666 we find him in Holland working feverishly on a fantastic project from which he expected great things. This was expressed in a petition to Parliament to grant him the sole use of an invention to make ships sail in a straight line regardless of the direction of the wind. He was actually granted a patent for this in 1668 and later he petitioned the King for its extension to apply to vehi-

cles on land: "to make Coaches, Waggon, Carts, Ploughs, to go by Engine without Horses." Research by Scarffenberg in 1902 shows that he also was granted a patent for this purpose by the Swedish Government in 1669. Scarffenberg says that Chamberlen was suffering from "paranoia inventoria et religiosa." Even so, should Peter III visit Ludgate Hill today he would not be surprised too greatly by what he saw. His next project was a plan for phonetic writing: "whereby better to represent to the eye what the sound doth to the ear." This at least is a fine definition of this branch of language study. Again his friend the King gave him the benefit of an invention for fourteen years, but nothing further seems to have come of it. Peter III's last great project was his most prodigious. This was a plan to unite the Jewish religion with all the Christian sects. His intentions in this field are recorded in a series of letters to Archbishops Sheldon and Sancroft.

At the advanced age of eighty-two Peter III died at Woodham Mortimer Hall in Essex and was buried in the local churchyard. Living at the time of his death were his wife, Anne, three sons, Hugh, Paul and John, two daughters, and numerous grandchildren and greatgrandchildren. He is regarded as the most distinguished member of the family. Today we think of him as being considerably maladjusted, of inventive imagination, irascible when opposed, and intolerant of others' opinions, keeping an eye on the main chance, in other words, a Chamberlen of the forceps family. There is no doubt that he could have invented the forceps and for a time it was believed that he did so; but Aveling thinks that probably he inherited the instrument from his father and that his uncle Peter the Elder invented the instrument. This last assumption seems likely; for it certainly was something more than charm that gave this barber-surgeon, Huguenot

refugee, non-member of the powerful College of Physicians, so firm an establishment in Royal circles.

The next Chamberlen for our attention is Hugh, the eldest son of Peter III. He is referred to as Hugh senior, distinguishing him from his son of the same name. He was born about 1630, but no birth record exists. Neither do we know anything of his early education or his professional training. He is, however, often referred to as Dr. Hugh Chamberlen, and on the title page of his translation of Mauriceau's book he appears as "Hugh Chamberlen, M.D. physician in ordinary to His Majesty."

Hugh senior practiced midwifery and had the family forceps secret. In 1670 he went to Paris where, hoping to realize a fortune by the sale of the invention, he importuned the famous Mauriceau to grant him a trial of the instrument. As it happened at that moment the French obstetrician had a woman with a badly deformed pelvis whom he had been unable to deliver. After three hours of strenuous effort Chamberlen was forced to retire from exhaustion without accomplishing what he had proposed to do in fifteen minutes. Mother and child both expired within twenty-four hours. In spite of this failure Chamberlen remained on good terms with Mauriceau and within six months was back in Paris offering to sell the family secret to the Prime Minister for a large sum. At this time he saw Mauriceau once more and on his return to England translated his book into English under the title, *The Diseases of Women with Child and in Child-birth* (1672).

Great credit must be given to Hugh Chamberlen for this service to British obstetrics, for his translation remained the most popular textbook of the subject for many years. There were numerous editions, all containing the same preface

written by the translator. In this are many revealing statements, perhaps none more so than the following:

In the 17th Chapter of the second Book, my Author justifies the fastning Hooks in the Head of a Child that comes right, and yet because of some Difficulty or Disproportion cannot pass; which I confess has been, and is yet the Practice of the most expert artists in Midwifery, not only in England, but throughout Eupope; and has caused the Report, that where a Man Comes, one or both must necessarily die; and is the reason for forbearing to send, till the Child is dead, or the Mother dying. But I can neither approve that Practice nor those Delays; because my Father, Brothers and my Self (tho none else in Europe as I know) have, by God's Blessing and our Industry, attained to, and long practised a way to deliver Women in this Case, without any Prejudice to them or their Infants.

Later in the preface this is added:

I will now take leave to offer an Apology for not publishing this Secret I mention we have to extract Children without Hooks, where other Artists use them, viz, there being my Father and Two Brothers living, that practise this Art, I cannot esteem it my own to dispose of, or publish it without Injury to them; and think I have not been unservicable to my Country, altho I do but inform them that the forementioned three Persons of my family, and my Self, can serve them in these Estremities, with greater Safety than others.

Later editions of Chamberlen's translation added to his emoluments that of Fellow of the Royal Society, a position to which he was elected in 1681. Among his fellow members in this distinguished group were Christopher Wren, Samuel

Pepys, Isaac Newton and Robert Boyle. Mauriceau is reported to have claimed that the book brought £30,000 to its translator.

In 1673 Hugh's father, Peter III, who seemed always to be successful in his efforts to obtain Royal favor, had made a petition to Charles II which resulted in the son being made His Majesty's Doctor in Ordinary. James II reaffirmed the appointment in 1688. Hugh Chamberlen was summoned but arrived too late to be present at the birth of the Queen's son, long afterward to be known as the Old Pretender. Nevertheless, he wrote an account of the birth to Princess Sophia declaring his certainty that "no such thing as the bringing of a strange child in a warming pan could be practised without my seeing it; attending constantly in and about all of the avenues of the chamber." This communication was designed to scotch a ridiculous story that a supposititious baby had been introduced in a warming pan. This was the tale that the King's enemies had circulated while secretly making arrangements with William of Orange to take over the government in his wife's name. Chamberlen's testimony was of little avail, for on November 5, 1688, William landed at Torbay, the Queen fled to France, and shortly afterward the King also went into exile.

Under the new sovereigns Hugh retained his Court appointment, but his services as man-midwife were never required by Queen Mary, who remained childless. On April 17, 1692, he did attend another Royal personage, for the record shows: "Dr. Chamberlen had the honour to lay the Princess [Anne of Denmark] of a Son which immediately Dyed. He had a hundred guineas for his pains."

In 1694 Hugh Chamberlen published a work entitled, *A Few Queries relating to the Practice of Physic &c.* The

volume ends with a health plan for England which would give free medical care to the poor as well as the rich in all diseases except the pox, midwifery, and cutting for the stone. This "Establishment of Physic" was to be under the control of seven colleges situated in proper areas. He is another Chamberlen who, if he could visit England today, would not be too surprised by what he saw in the changes attending medical practice there.

For a number of years Hugh's active mind had been working on a plan to "make England rich and happy" by means of a Land Bank. A good account of this venture is found in Macaulay's *History of England*. The failure of this scheme is said to have caused its projector to retire to Holland in 1699, on "suspicion of debt." From this time on traces of Hugh senior are lost. He practiced in Amsterdam and probably died there. However, while he lived in that country two things happened which are of more than ordinary interest. One was his proposal for a union of England with Scotland remarkable for its logic and for its influence in bringing about The Union. The other was his sale of the family secret to van Roonhuysen. This caused a monopoly of the instrument which lasted for the next sixty years.

Of passing interest is Hugh's brother Paul, who was born in 1635. He also practiced midwifery but is regarded as an out and out charlatan. He is known as the inventor of the "Celebrated Anodyne Necklace recommended to the world by Dr. Chamberlen for children's teeth, women in labour etc."

The last of the male line of the Chamberlens was Hugh junior, born in 1664. He succeeded so well and became so prominent socially that after his death a large monument was erected for him in Westminster Abbey. This Hugh was

educated at Trinity College, Cambridge, receiving his M.D. there in 1689. He was popular as an obstetrician, was a Fellow of the College of Physicians, and was three times elected as censor, a position which would have surprised some of his ancestors. By comparison Hugh junior's life was calm and uneventful, but he too had friends in high places. Among these was John Suffield, Duke of Buckingham, and his Duchess. During the latter part of his life Hugh lived at Buckingham House and it was there that he died. His cenotaph in the Abbey "consists of an inscribed basement, a sarcophagus, several figures, a pyramid, and a circular pediment (with mantling) rising from pilasters of the Doric Order."

One other grandson of Peter III deserves attention, Sir Chamberlen Walker, an Irish obstetrician who was the son of Hugh's daughter Elizabeth and Colonel William Walker of Ireland. He is alleged to have invented the so-called English lock of the forceps. This is unlikely, but if he did indeed devise this addition to the instrument he is worthy to stand beside any of his Chamberlen ancestors.

How we know today about the original appearance of the Chamberlen forceps makes a story which has many of the aspects of a mystery thriller. It begins at the time when Peter III purchased Woodham Mortimer Hall near Malden some time before 1638. He is known to have lived in the house and to have died there in 1683. In 1715 the estate was sold by his daughter to William Alexander, a wine merchant. One hundred years later the house was occupied by a Mr. and Mrs. Codd. In 1813 Mrs. Codd's mother, Mrs. Kemball, who was visiting, happened one day to go into a closet above the entrance porch and there noticed what appeared to be a cork or disc of wood in the floor and a similar

one nearby. Each was found to cover a screwhead and further investigation revealed a trap door with small sunken hinges. When this was raised a space five and a half feet square and twelve inches deep was discovered under the floor. According to the report:

This contained some boxes in which were two or three pairs of midwifery forceps, several coins, a medallion of Charles I or II, a miniature of the Doctor, damaged by time, a tooth wrapped in a paper written on 'My husband's last tooth,' some antique plate, a pair of lady's long yellow kid gloves, in excellent preservation; a small Testament, date 1645.

Into this picture Lady Luck certainly stepped, in the person of a friend who was called in to appraise the discovery. This was Mr. Henry Cawardine, a retired surgeon then engaged in writing a history of surgery. He recognized the instruments as midwifery forceps, and the fact was soon established that they had once belonged to Dr. Peter Chamberlen. There were four pairs of forceps, one so crude that they undoubtedly were an experimental pair, each of the others showing improvements. Through Mr. Cawardine the instruments were presented to the Medical and Chirurgical Society of London, now the Royal Society of Medicine.

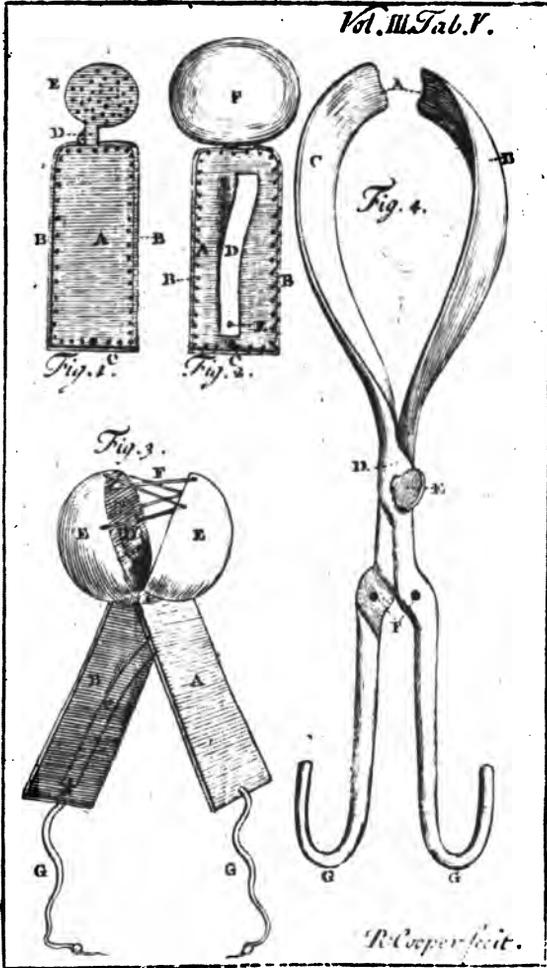
That the Chamberlens' secret should eventually become known was inevitable, the wonder being that it was kept so long. The custom which made the secret possible at all was the requirement that in delivery the man-midwife perform all his manipulations under a sheet, the ends of which were tied around his neck. He was thus working blindly with only a sense of touch to guide him, but he was also working secretly, for no one in the room could see what he was doing.

All this was an appeasment to the sense of modesty which had been defied when men were allowed in the lying-in chamber. Under-the-sheet manipulations were carried into the 18th century and beyond. The great William Smellie operated in this fashion, giving specific directions in his writings for the forceps application in these circumstances.

The van Roonhuysen of Holland, to whom Hugh senior sold the secret of the forceps in the first years of the 18th century, is said in turn to have shared it with five other men, all members of a medical examining board in Amsterdam. This group is supposed to have sold the secret to examination candidates who could pay the price. A John Peter Rathlaw, who had studied in London and wished to practice in Amsterdam, even made the charge that his license was withheld, though he had passed the necessary examination, because he would not buy the board's instrument. Possibly as revenge he is said to have got all the information he could from a fellow physician who had seen van Roonhuysen's forceps and then published in a book (1747) the statement that two levers joined by a hinge could be applied to the child's head and used as a forceps for extraction.

Meanwhile the principle of the forceps was becoming known. Paul de Windt, one of those who shared the secret with van Roonshuysen, went to Paris in 1734. He has stated that the obstetrician Gregoire showed him "two large spoons which could be coupled by means of a transverse cross-hook." He also says:

I lived in the house with N. Dusée another well known obstetrician who showed me and my fellow traveller, Mr. J. Boswell, now a Doctor of Medicine at Edinburgh another instrument for the same purpose, which he declared to us was his own in-



Courtesy of the Yale Medical Library

OBSTETRICAL FORCEPS (FIG. 4)

This is the instrument presented to the Medical Society by Alexander Butter in 1733. From *Edinburgh Medical Essays*, Volume III, Fourth Edition, 1752.

vention. It was the same forceps a sample of which was obtained from him by Mr. Alexander Butter and represented in the third volume of the *Medical Essays of Edinburgh*.

Dusée never published the invention himself. It was given to the world by his Scottish pupil Alexander Butter, who had first demonstrated it to a medical society in Edinburgh in 1733.

Walter Radcliffe, writing in 1947, calls the sale of the forceps in Holland the Dutch Mystery and proposes that it was the idea rather than the actual instrument which was sold. He contends that the great secret was given to the world by two English doctors from a rural part of Essex, Edmund Chapman and Walter Giffard. He says that it was the former who published the first account of the Chamberlen forceps. However, Partridge in his comprehensive essay declares: "It is clear that Giffard was the altruistic and honorable physician who should receive full credit for introducing the forceps into common use in England." Edmund Chapman published his *Treatise on the Improvement of Midwifery etc.* in 1733 and in the next year Giffard's book appeared, being edited by Edward Hody, a Fellow of the Royal Society. Giffard called the forceps his "Extractor," and from him comes the earliest record of the actual use of the forceps. This appears under Case XIV of April 6, 1726.

The second page of Giffard's work is a plate representing: "Mr. Giffard's Extractor" and also the "Extractor as improved by Mr. Freke, Surgeon to St. Bartholomew's Hospital." The handles of the latter were made to fold up. Something of Freke's appearance has come down to us in Hogarth's drawing "The Reward of Cruelty," where he is shown presiding over a dissection.

C A S E S
I N
M I D W I F R Y .

Written by the late
Mr. WILLIAM GIFFARD,
Surgeon and Man-midwife.

Revis'd and Publish'd
By **EDWARD HODT, M. D.**
and Fellow of the *Royal-Society.*



L O N D O N : .

Printed for **B. MOTTE**, at the *Middle-Temple-Gate*; and **T. WOTTON**, at the *Lycen's-Head* and *Three Daggers. Fleet-Street.* 1734.

Courtesy of the Yale Medical Library

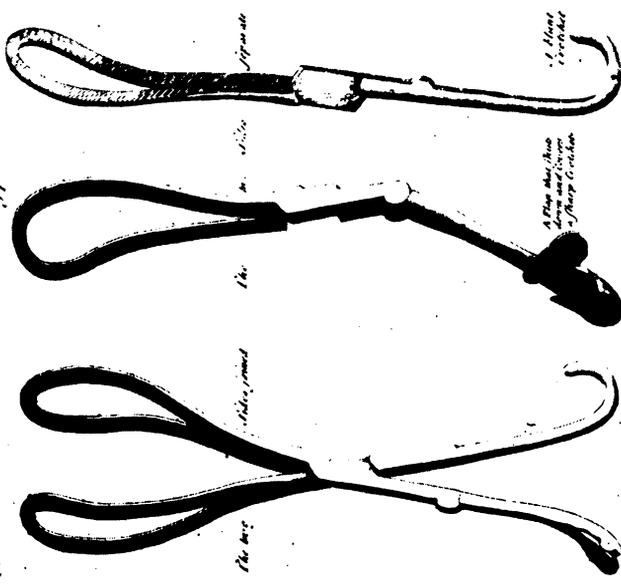
TITLE PAGE, WILLIAM GIFFARD'S *Cases in Midwifry*

Another Essex doctor who played a prominent part in the general introduction of the forceps was Benjamin Pugh. He is credited by Radcliffe with being the first to construct an instrument with the so-called pelvic curve, that is, a curve in the blades extending upwards from the handles in conformity with the contour of the sacrum, which forms the posterior part of the mother's pelvis. In 1751 Andre Levret of Paris produced the same thing and apparently William Smellie of London did it independently the year following.

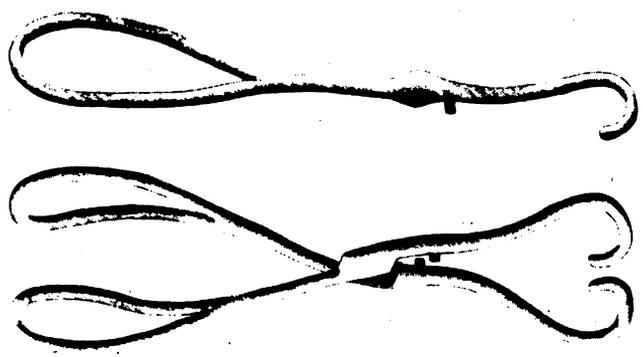
It is obvious why so useful an instrument as the forceps should occupy such a prominent place in the development of modern obstetrics. Its history, from the crude wrought-iron instruments of the Chamberlens to the finely balanced slender forms used today, is the subject of a voluminous literature in textbooks and in separate treatises. One of the most important reference books is that of Kedarnath Das of India, which runs to 903 pages and has 878 illustrations.

In reviewing the long history of the introduction of the forceps we should probably conform to the opinions of others and judge the Chamberlens by the customs of their times. In the 17th and 18th centuries there are plenty of instances in which remedies and instruments were held secret by those who were considered reputable doctors. What could be more reprehensible than the actions of a Dutch medical examining board in withholding the secret for themselves? In their own day the Chamberlens without doubt were highly skilled obstetricians. They were also successful doctors, some of them having what is reckoned as genius. A certain thing called luck was also sometimes on their side as it was with William and Genevieve Chamberlen on St. Bartholomew's Day, August 24, 1572.

*The Extractor as improved by Mr. Freke
Surgeon to St. Bartholomew's Hospital.*



Mr Giffard's Extractor.



Courtesy of the Yale Medical Library

GIFFARD'S EXTRACTOR AND THE ONE "IMPROVED BY" MR. FREKE
From Giffard's *Cases in Midwifery*

The two obstetrical operations most frequently performed today are the forceps operation and the cesarean section. Of the two the former is done far more often than the latter. The great majority of forceps operations are regarded by obstetricians as simple procedures not requiring any unusual strength or great technical skill to accomplish. One of the great teachers of a previous generation, Joseph B. DeLee, used to tell his students over and over that it was not force but art, *non vi sed arte*, that was essential in all forceps operations.

Before the development of safe modern techniques in the cesarean operation the forceps operation was more common than it is now, being the chief recourse for the obstetrician in many types of difficult labor. Today the cesarean operation is often not only safer for both mother and child than the difficult forceps operation but it is actually less traumatic. Most forceps today are those designated as *low forceps*, that is, done at a late stage of labor when the baby's head is low in the mother's pelvis, where it has been advanced by the mother's expulsive efforts. It is a simple operation to do and it is a simple one to understand if we consider the thin curved blades of the forceps as cupping the baby's head like artificial hands and gently drawing it into the world. Other forceps operations are not so simple and require a high degree of technical skill, especially when the head is in malposition in the mother's pelvis, but even here Dr. DeLee's dictum is pertinent. Such cases are relatively rare, however, and in the great majority of instances the forceps are used chiefly to shorten unduly prolonged labor or to reduce pain for the mother or to prevent trauma to both mother and baby. The obstetrical forceps remains the most beneficent surgical instrument ever devised.

CHAPTER SIX

THE 18TH CENTURY, THE GREAT TEACHERS

The 18th century saw obstetrics established on a plane with other medical subjects. In both Europe and America it came to be more and more included in the practice of physicians. The great teachers of the period established a preceptorial tradition which passed from master to master down to our own day. Those who were chiefly responsible for this impulse we recognize as men of heroic stature whose ideas and writings are reflected in the triumphs of modern obstetrics. The greatest of these figures was William Smellie, who has been called the Master of British Midwifery. He was this and more, for no obstetrical author ancient or modern established so many principles of obstetrical science. An idea of his interesting career may be gained by the mention of some of his friends: William Hunter, Tobias Smollett, William Cullen, and James Douglas. His, also, was the London of Samuel Johnson, Joshua Reynolds, Oliver Goldsmith, and Laurence Sterne.

William Smellie was born in Lanark, Lanarkshire, in 1697. Four of Britain's greatest physicians were born in this county, William and John Hunter, William Smellie, and William Cullen. Smellie studied medicine in Glasgow and began to practice in Lanark in 1720. He remained here for nineteen years, building up a considerable obstetrical prac-



W^m Smellie?

DR. WILLIAM SMELLIE, 1697-1763
The original portrait is said to have been painted by Dr. Smellie.
From H. R. Spencer: *History of British Midwifery*

tice along with that of general medicine. His close friendship with the author Tobias Smollett is said to be reflected in Dr. S. and Mrs. S. in *Peregrine Pickle* and *Memoirs of a Lady of Fashion*. Combined with Smellie's skill as a physician was an exceptional talent in drawing and painting and a great love of music. An excellent self-portrait is in the Royal College of Surgeons in Edinburgh.

Smellie became aware of the obstetrical forceps from Butter's diagram in the Edinburgh *Medical Essays*. He immediately recognized the great value of this innovation and about this same time began to sense the limitations of practicing obstetrics at Lanark. He has recorded something of this in the following:

In order to avoid this loss of children, which gave me great uneasiness, I procured a pair of French forceps, according to a draught published in the *Medical Essays* by Mr. Butter; but found them so long and so ill-contrived that they by no means answered the purposes for which they were intended. I afterward perused the treatises of Chapman and Giffard who had frequently saved children by a contrivance of this kind; and actually made a journey to London in order to acquire further information on this subject. Here I saw nothing was to be learned; and . . . I proceeded to Paris, where courses on midwifery were given by Gregoire. There likewise I was very much disappointed in my expectation.

Smellie did, however, gather an idea in Paris which he subsequently put into useful practice in his teaching. This was the obstetrical machine or mannikin. In his own words he conceived the idea of forming mannikins "which should so exactly imitate real women and children as to

exhibit to the learner all the difficulties that may happen in midwifery; such I actually contrived and made by dint of uncommon labour and application.”

Even before coming to London Smellie's great love for obstetrics is seen in the extraordinary records of his practice in and around Lanark. It was here, where he seldom had recourse to outside assistance, that his self confidence and high technical skill were built up. In 1738, relinquishing his practice in Lanark, he took the highroad to England, dubbed ironically by Samuel Johnson “the finest prospect in Scotland,” and settled in London.

Two years later, in November, 1740, he received into his house in London, probably as a boarder, his fellow countryman William Hunter. It was a rich experience for that young medical student to be in close contact with an enthusiast like Smellie. Hunter remained to practice in London, although he was expected to return to Scotland and become a partner of his preceptor, William Cullen.

Smellie began to teach in 1741. His course of lectures was short, with demonstrations on the mannikin and attendance with students on poor women for delivery in their homes, there being no maternity hospitals in the city at that time. In 1739 Sir Richard Manningham had established lying-in wards in a house next to his own, but not until 1747 were such wards opened in Middlesex Hospital. Smellie at no time in his life attained to a staff position in any of the lying-in hospitals in London. He may not have had the right contacts for such preferment and his success as a teacher no doubt made him unpopular in some high professional circles. That there was jealousy on the part of some of his fellow practitioners is known, and it is certain that their feeling was shared by certain influential midwives. These

women, aware that they were losing the battle in their fight to suppress man-midwifery, aimed their heaviest artillery at the man who was teaching scores of doctors each year the soundest and best obstetrics then known anywhere.

Smellie lived in the golden age of the pamphleteer, who flourished then in Britain and our own country as never before. Here most of this lampooning was political, but there it was extended to the learned professions, the medical in particular. The gentler side of this art is to be seen in Laurence Sterne's *Tristram Shandy*, where theology, medicine and warfare all come in for a full share of comment. Some of the broadsides aimed at individuals, such as those directed at Smellie, were vituperative to a degree hardly to be surpassed. An example is seen in a book by a Mrs. Nihell, *Professed Midwife*, published in 1760 and dedicated "To all Fathers and Mothers, and likely soon to be either." She referred to Smellie's large hands as: "the delicate fist of a great horse god-mother of a he-midwife, however softened his figure might be, his pocket nightgown being of flowered calico, or his cap of office tied with pink and silver ribbon." This last was a reference to Smellie's adoption of a "loose washing nightgown" for delivering, not too different from the doctor's gown worn today. A member of his own profession, William Douglas, referred to Smellie's "monstrous hands . . . fit only to hold horses by the nose as they are shod by the farrier."

Smellie's latest biographer, R. W. Johnstone, says:

It is regrettable that a number of writers who have touched upon Smellie's life in their addresses and articles have picked out from these scurrilous lampoons what seemed to them pithy and eminently quotable phrases. How many readers remember that Smellie was said to have abnor-

THE THIRD TABLE

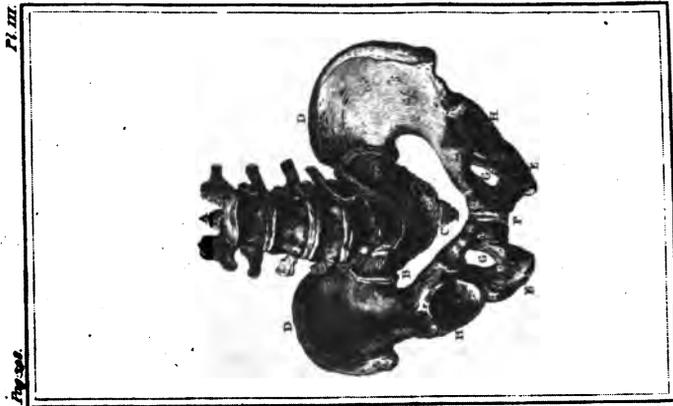
Exhibits a Front-View of a distorted *Pelvis*.

- A The five *Vertebrae* of the Loins,
 B The *Os Sacrum*,
 C The *Os Coccygi*,
 D.D The *Ossa Iliaca*,
 E.E The *Ossa Ischiaca*,
 F The *Ossa Pubis*,
 G.G The *Feramina Nigra*,
 H.H The *Acetabula*.

From this Plate may appear the great danger incident to both Mother and Child when the *Pelvis* is distorted in this manner; it being only two inches and an half at the Brim from the posterior to the anterior part, and the same distance between the inferior parts of each *Os Ischiaca*. *Vide* Tab. XXVII. where the *Pelvis* is one quarter of an inch narrower at the Brim than this, but sufficiently wide below. Various are the forms of distorted Basins, but the last mentioned is the most common. It is a great happiness however in practice that they are seldom so narrow, though there are instances where they have been much more so. The danger in all such cases must increase or diminish according to the degree of distortion of the *Pelvis*, and size of the Child's head.

Vide Vol. I. Lib. 1. Chap. I. Sect. 4. 5. and Vol. II. Coll. 1. No. 3. 4. 5. *Alto Coll.* at. 27. and 29.

THE



Published by W. Smellie, T. Child, & C. Co., Jan. 1. 1779.

FROM WILLIAM SMELLIE'S, *A Treatise on the Theory and Practice of Midwifery*, LONDON, 1779.

mally big hands, but can recall little about his great place in the history of obstetrics?

The teaching and practice of William Smellie is best seen in his *Treatise on the Theory and Practice of Midwifery*, the first volume of which was published in 1751-52. The second and third volumes contain case-records, the third not appearing until 1764, nearly a year after his death. Not the least interesting fact about the treatise is that the revision was made by his one-time pupil and friend, Tobias Smollett. In his preface Smellie declares:

Neither did I pretend to teach midwifery till after I had practiced it successfully for a long time in the country; and the observations I now publish are the fruits not only of that opportunity, but more immediately of my practice in London during ten years, in which I have given upward of 280 courses of midwifery, for the instruction of more than 900 pupils, exclusive of female students; and in that series of courses 1050 poor women have been delivered in the presence of those who attended me; and supported during their lying-in by the stated collections of my pupils; over and above those difficult cases to which we were often called by midwives, for the relief of the indigent.

Smellie's great book shows him to be an original thinker as well as an adept obstetrician. Its most outstanding feature is his teaching of the mechanics of labor, in which he laid the keystone of scientific obstetrics. His understanding was no accident, for in his case books which he kept for thirty years he shows himself a diligent student of nature. It was in the lying-in chamber that Smellie found the secret of the labor mechanism, namely, that the longest diameter of the fetal head would adapt itself to the longest diameter of the pelvic canal and that throughout the whole progress

of labor this relationship normally is maintained. In recent years these important findings have been substantiated again and again by x-ray studies made during labor.

Smellie was also a pioneer in pointing out that the fetus was but a passive agent during the course of labor, changing the theory then current that a dead child was born with more difficulty than a live one. He also was the first to state that an eighth month child had more chance of survival than one at the seventh month, a reversal of the superstition sometimes still held by ignorant people today.

Smellie showed that the placenta could be attached to any part of the inner uterus, exploding the idea that it was always attached to the upper pole. A notable achievement was his modification of the obstetrical forceps. He designed a short, straight forceps and a longer, curved instrument for use when the head became arrested in the upper part of the mother's pelvis. Most authorities agree that it was Smellie who designed the ingenious so-called English lock of the forceps. In a letter he wrote to a friend he declares, "About three years ago I contrived a more simple method of fixing the steel forceps by locking them into one another, by means of which they have all the advantages of the former kinds without the inconvenience." It is to Smellie's great credit also that he was the first obstetric teacher to lay down safe rules for the use of the forceps. Rules formulated in 1751 are practically those which are taught today.

As a dedicated man William Smellie is best seen in his advice to the physician who elects to practice obstetrics. Of his necessary qualifications, he writes:

He will assist the poor as well as the rich, behaving always with charity and compassion. He ought to act and speak with the utmost delicacy of decorum,

and never violate the trust imposed in him, so as to harbor the least immoral or indecent design; but demean himself in all respects suitable to the dignity of his profession.

Smellie retired from the London scene in 1759 at the age of sixty-two and with his wife went back to Lanark to spend the four remaining years of his life. Not much is known of his life there, but no doubt his love of music — he played the flute — and his love of art meant much to him at this time. His practice and teaching in London were taken over by his assistant, Dr. John Harvie, who married a niece of Mrs. Smellie. His library, which he left to the town of Lanark, is still preserved there, a witness to his fine literary tastes.

It is not difficult to assess William Smellie as the Master of British Midwifery and more. Neither is it difficult to sense his devotion to medicine if we but read his own words. In them one sees him hour after hour in the lying-in chamber, encouraging his patient by word and deed, studying the forces of nature, patiently teaching students whose initial efforts were no doubt clumsy and often stupid. Under these conditions, in this environment, when he put on his calico nightgown as an aid in his purpose to save two lives, humor has little place in the situation. Smellie's enemies used against him the same sort of scurrility that was used a century later against Abraham Lincoln, whose foes did not like his looks either. The comparison is a likely one, for the physical aspects of each offered an easy target. Both made contributions to human welfare of highest significance and both had that essential of greatness that outwardly ignores the sniping of inferiors while pursuing a great ideal. Smellie, also, had "malice toward none."

Historically by the side of William Smellie at the head of British obstetrics was his one-time boarder William Hunter, and no two men could have differed more in temperament, manners, and appearance. Hunter, too, came to renown and great influence as a teacher. He and his brother John so furthered the establishment of scientific medicine, on its only sure basis—*anatomy*—that their time has been referred to as the Era of the Hunters.

William Hunter was born at Long Calderwood, Lanark, in 1718. At thirteen he went to Glasgow University, remained there five years and then turned to medicine. The next three years, which he later called “the happiest years of my life,” he spent with William Cullen.

In 1740, armed with a letter from Cullen, he spent the winter in the house of William Smellie in London, after which he went to live with James Douglas while attending as a student at St. George’s Hospital.

Hunter began his medical career as an anatomist, practicing surgery along with teaching. Later he took a medical degree and eventually devoted himself chiefly to obstetrics. As an anatomist his name is among the greatest, for as lecturer, demonstrator, and research worker, none has surpassed him. The Hunterian Museum in Glasgow stands today as one of his chief memorials, and many of his specimens which are to be seen there are marvelous to behold.

When William Hunter turned his attention to obstetrics, his great personal charm and abundant energy soon brought him into high favor. Accordingly: “The aristocracy were at his feet and the King was his friend.” Honors were heaped upon him. He became Physician Extraordinary of the Queen and, as he wrote to Cullen, he had “the sole direction of her Majesty’s health as a child-bearing lady.” Among his in-

timate friends were Hume the philosopher, Gibbon the historian, the Earl of Chatham, the Earl of Rockingham, and Lords North, Bute and Newborough.

Among his great contributions to anatomy and physiology was his work on the lymphatic system, said to rank in importance with the discovery of the circulation of the blood. His crowning achievement after thirty years of study was *The Anatomy of the Human Gravid Uterus Exhibited in Figures*. It is for this work that William Hunter has been called the "founder of scientific obstetrics." His fame as an obstetrician came chiefly through his anatomical research applied to obstetrical teachings, not through his clinical skill. This famous work, published in 1774, remains today a masterpiece of exposition and delineation. Its magnificent large-scale illustrations cannot be fully appreciated unless viewed in the original text. In this work he was aided in dissection by his equally famous brother John. It is to William, however, that we owe our knowledge of the true circulation of the human placenta. He it was who first likened the fetal portion to a plant with its roots buried in the tissues and fluids of the mother. He discovered and named the decidua or lining of the pregnant uterus.

Hunter praised the forceps of Smellie, although in practice he seldom used them, preferring to wait for nature and even carrying this conservatism at times to an unwarranted degree. He never married, had no family responsibilities, and his chief ambition was to succeed as a teacher of anatomy. The historian of British Obstetrics, H. R. Spencer, says of him: "The fact is that William Hunter was a great, perhaps the greatest anatomical teacher, and it is as a teacher and a breeder of anatomists—to use his own words—that he excelled."

With these two masters of obstetrics, fellow Scots, practicing and teaching at the same time in London, it seems strange that there has not been preserved more evidence of their contact with each other. The dissimilarity of their personalities was so great that an intimate friendship between them seems not likely. Smellie was older by twenty-one years, loved his home life, worked constantly at his practice, and was a good deal of a rough diamond. Hunter was the opposite: charming and polished in manner, meticulous in dress, of a contentious mind and not prone to give praise to others. But while there is little evidence of intimacy between them, Smellie's biographer Johnstone says that when they did meet it was on quite good terms. What interests the historian is the difference in the pathways of their climb to the top. One thing they possessed in common was what Smellie called "dint of uncommon labour and application." It is the pride of all obstetricians that no other field of medicine can outmatch these two, William Smellie and William Hunter.

In the 18th century there were other stars in the galaxy, though of lesser magnitude. Among these was Sir Fielding Ould of Dublin, who has come down to us in a happy jingle current when his knighthood was conferred:

Sir Fielding Ould is made a knight,
He should have been a lord by right;
For then each lady's prayer would be—
Oh Lord, good Lord, deliver me!

Ould is to be remembered more, however, for his original understanding of the mechanics of labor, which ranks with that of Smellie. As the second Master of the famous Rotunda Lying-in Hospital he was in a strategic position to influence the development of scientific obstetrics in Ireland.

Before his appointment as Master he published in 1742 his *Treatise on Midwifery*, which was regarded for a generation as one of the best in the language. Fielding Ould was born in Galway in 1710. He studied in Paris for two years, probably under Gregoire, and settled in Dublin about 1736 or 1737. At that time in order to obtain a medical degree the applicant had to be examined by the College of Physicians. In his case the College refused to do this on the ground that the practice of midwifery was undignified in the practice of medicine. In 1761 Trinity College went ahead on its own and conferred the degree of M.D. upon him. The College of Physicians took great exception to this, stating: "Your College [Trinity] has thought proper to grant a degree in our Faculty to a person who had no academic education, and whom you know to be disqualified by his occupation for a Licence to practice our profession." Thus it was that Fielding Ould became the innocent cause of a quarrel between these academic bodies, no doubt hastening the recognition of midwives by the College of Physicians. This state of affairs brought forth more rhyme, this time applied to a Dr. Sproul, an army surgeon of prominence.

The College him a Fellow would announce,
Condition this, to Midwifery renounce;
Renounce but sooner he would his Right hand
Than from the service of the Fair disband.
Why may not any Doctor that would chuse
For man's relief his total knowledge use,
Or does one portion of Apollo's Trade
More than the rest his votaries degrade?

Ould anticipated modern obstetrical practice in recommending incision of the posterior vaginal wall (episiotomy) when its rigidity prevented the fetal head from being born.

He showed deep insight into clinical obstetrics by recommending, in cases of prolonged labor, that if the spirits be much exhausted and the pains grow very short and of little or no advantage, then an opiate is of surprising service. Sir Fielding Ould continued to practice until the age of seventy-nine and died of apoplexy shortly after delivering a patient.

After William Hunter died in 1783 the number one position in obstetrical practice in London went to Thomas Denman, then fifty years old. To him more than to any other is given credit for the adoption of the operation of induction of premature labor in women with small or deformed pelves. His *Introduction to the Practice of Midwifery*, the first volume of which appeared in 1794, went through seven editions, the third being called by Spencer the most splendid work on midwifery in the English language: "whether regarded from the point of view of the format, paper, printing, and illustrations of the work; the learning and knowledge that it exhibits; or the ordered lucid and judicial manner in which that knowledge is presented."

In the conduct of labor Denman was a great believer in studying and trusting nature's efforts, as were Smellie and Hunter before him. "All the errors of practice," he writes: "do not proceed from ignorance of the art. Some of them may justly be imputed to our entertaining too high an opinion of the art, or too much confidence in our own dexterity, or too little dependence on the natural efforts and resources of the constitution." This advice he printed in italics, an emphasis not out of place today.

Thomas Denman was born at Bakewell in 1733 and came to London at the age of twenty-one to take two courses in anatomical lectures at St. George's Hospital. His funds

then being depleted he passed examinations as a ship surgeon and for the next nine years supported himself in various of His Majesty's ships. He set up practice in London in 1764 and in 1770 was appointed Physician Man-midwife to the Middlesex Hospital, beginning to lecture in midwifery the next year. From that time on his affairs flourished, his magnum opus appearing when he was sixty-one. Denman practiced far into old age and lived until 1815; at that time "his hair was perfectly white, his complexion fresh and vigorous, his eye, which was blue, continued remarkably clear and bright, his hearing was unimpaired, and his teeth remained entire to the very last. Such was he in his eighty-second year." It was in Denman's time that the great tradition of obstetrical teaching in England became established and it was during this time that obstetrical teaching in our own country made considerable progress, chiefly due to the efforts of William Shippen Jr. of Philadelphia and Samuel Bard of New York.

Shippen was the first lecturer on obstetrics in this country and the first man to establish a hospital for such instruction. His father, Dr. William Shippen, was a leader in medicine and the first physician to the Pennsylvania Hospital. He was also a member of the Continental Congress. William Shippen Jr. was born in Philadelphia in 1736. He attended the Reverend Samuel Finley's Academy at Nottingham and entered the College of New Jersey (Princeton) where he graduated in 1754. He studied medicine in Philadelphia until 1758 when he went abroad to complete his education. William Shippen Jr. was one of the fortunates born in time and place, for no American medical student of that day had a richer experience or came into finer contact with the great and near-great abroad. His first res-



WILLIAM SHIPPEN, 1736-1808
From a portrait in the College of Physicians, Philadelphia

idence in London was in the family of John Hunter, at that time assisting his brother William at the Anatomical Museum. He became friendly with Sir John Pringle and Dr. Fothergill. The latter was the leading physician in London, a Quaker, and much interested in the Pennsylvania Colony and the newly established Pennsylvania Hospital. At the expense of 200 guineas Fothergill employed the artist Rensdyck, the same who did the famous illustrations for William Hunter, to execute drawings of anatomical structures, and these were later presented through Shippen to the Pennsylvania Hospital, where they still may be seen.

William Shippen had a particular interest in midwifery and attended lectures given by Colin Mackenzie, who had been a pupil of Smellie. He received his medical degree from Edinburgh and while studying there came under the instruction of the illustrious Cullen. After Edinburgh Shippen resided for a time in France, where he came in contact with other notables including that genius of literary obstetrics, Laurence Sterne. When he returned to London, Sterne gave him a letter of introduction to the actor David Garrick. He apparently was getting around, for shortly after coming to London this time he became engaged to Alice Lee, daughter of Colonel Thomas Lee, the Acting Governor of Virginia. This lady was at that time living in London with her uncle Philip Ludwell III. Among the circle of friends found in this household were Fanny Burney, Dr. Samuel Johnson, James Boswell, John Paradise and his own benefactor John Hunter. William Shippen Jr. and Alice Lee were married at St. Mary Le Strand, Middlesex, on April 3, 1762, and a few days later sailed for America.

In November of that year Shippen announced in a

newspaper his intention of giving a course of anatomical lectures for young gentlemen engaged in the study of physic where circumstances did not permit their attending the anatomical schools of Europe. To be included in the course were "a few plain general directions in the study and practice of midwifery." Three years later in 1765 he began the first systematic lectures in obstetrics which were given in this country, and in this connection he established a lying-in hospital which provided "convenient lodgings for a few poor women under the care of a sober, honest matron well acquainted with lying-in women." He informed his prospective pupils that he would "be able to present each one of you with one natural labor at least, and have provided a machine by which I can demonstrate all kinds of laborious and preternatural labors, and so give every necessary direction to enable you to manage all cases with the greatest safety to mother and child."

On May 3, 1765, William Shippen was elected professor of anatomy and surgery at the newly established medical school at the College of Philadelphia. Later he occupied the chair of anatomy, surgery, and midwifery at the University of Pennsylvania. He had a distinguished career in the Revolution. He was Director General of Hospitals from 1777 to 1781, when he resigned to resume his teaching and practice. He remains eminent in the establishment of anatomical teaching and in the development of military medicine, but chiefly he is the great pioneer in American obstetrics.

The same year that Shippen began his systematic lectures in obstetrics (1765) another important figure in American obstetrics received his degree at Edinburgh. This was Samuel Bard of New York, who wrote the first work

published in this country on obstetrics, *A Compendium of the theory and practice of Midwifery*. At the time of publication (1807) the author was sixty-five years old and president of the College of Physicians and Surgeons in New York, an institution in which he spent the greater part of a lifetime, having been chosen at the age of twenty-eight to occupy the first chair of theory and practice of physic.

Like William Shippen, Samuel Bard was the son of an illustrious father. John Bard was a famous New York physician, a friend of Franklin and Washington, and the latter's personal physician. Samuel Bard was born in Philadelphia April 1, 1742. When he was four his family moved to New York. At fourteen he entered King's College and while pursuing classical studies there, studied medicine with his father. At the end of his college course it was decided that he should go to Edinburgh for his medical degree. In September, 1761, he embarked from New York, only to be captured three weeks later by a French privateer. England and France were then at war and as a prisoner of war he was confined for five months in a castle at Bayonne. Fortunately his father's friend Franklin, who was in London at the time, was able to obtain his release.

Bard at once proceeded to London where, at the recommendation of Dr. John Fothergill, he went to St. Thomas's Hospital as assistant to Alexander Russell. Six months later he went to Edinburgh where Cullen in particular delighted him. He declared that he "could listen to him for three hours instead of one." Bard graduated from Edinburgh in 1765 and returned to London for another ten months before sailing for America. His education abroad had cost his father over a thousand pounds.

While in Europe Bard had written to his father about

A
COMPENDIUM
OF THE THEORY AND PRACTICE
OF
MIDWIFERY,
Containing
PRACTICAL INSTRUCTIONS FOR THE MANAGEMENT OF
WOMEN
DURING PREGNANCY, IN LABOUR, AND IN CHILD-BED;
Calculated
To correct the Errors, and to improve the Practice, of
MIDWIVES;
As well as to serve as an Introduction to the
STUDY OF THIS ART,
For
STUDENTS AND YOUNG PRACTITIONERS.

—*—
By *SAMUEL BARD, M. D.*
—*—

NEW-YORK:
PRINTED AND SOLD BY COLLINS AND PERKINS,
NO. 189, PEARL-STREET.

—
1807.

Courtesy of the Yale Medical Library

THE FIRST AMERICAN TEXTBOOK IN OBSTETRICS
Title page of Samuel Bard's *Compendium of the Theory and
Practice of Midwifery*

the establishment of a medical school in New York. Within a year after his return an organization was effected and united to King's College. J. W. Francis says:

Bard is most closely associated with the first medical school of the colonies, for though Philadelphia boasts an origin some two or three years earlier it was in the New York School, King's College, that the first entire faculty of medicine was created, so that first association, for the first time in this country, established an independent Professor of Obstetrics, thus making up for the first time what is now universal in all the professorships of the regularly organized schools.

When the trustees of Columbia annexed the faculty of physic in 1782 Bard was appointed Dean of the Faculty. The New York Library and the New York Dispensary were established chiefly through his efforts. In 1795 he relinquished his practice in the city and moved to Hyde Park, New York. Here he became interested in agricultural pursuits and when David Humphreys introduced merino sheep into the country Bard became interested and wrote a book, on the subject called *The Sheperd's Guide*.

Bard's *Compendium of Midwifery*, which appeared first in 1807, was written from his country home. The excellence of this small volume is seen in the soundness of his observations today. He writes, "There is greater safety in this branch of medicine from modest unassuming ignorance, than from a meddling presumption which frequently accompanies a little learning." When a new edition was contemplated some of his friends solicited him to include a chapter on the use of the forceps, but he decided against this on the ground that the book was designed to "teach the progress and management of natural labour . . . and I will venture to assert that the better

the rules here laid down are understood, and the more steadily they are practised; the less frequently will the necessity of applying to instruments occur." Pelvic deformities are recognized in this work and directions given for their diagnosis through certain pelvic measurements. His recognition of the part that childhood rickets can play in the formation of deformed pelves is extraordinary for his day. He writes:

Nor is it only by injuring the shape of the bones that mismanagement in childhood unfits women for easy child-bearing, but by preventing firmness and vigour in general, and occasioning a weak, feeble, and irritable habit. A sedentary life and luxurious education are the chief cause of all the evils which women suffer during pregnancy and labor. Keep children therefore out of doors, in constant exercise; allow them full, but plain and simple diet; and when grown up to young women, let them live more agreeably to nature, let them avoid late hours and crowded rooms, indulge in soft beds, and luxurious diet; let them walk, ride, and dance.

In this observation Samuel Bard was not only far ahead of his time but somewhat in advance of our own. Today x-ray studies of pelvic changes in adolescence have proved the soundness of his observations, but all too little attention is paid to the subject.

Samuel Bard died in 1821, his death occurring within twenty-four hours of that of his wife, with whom he had lived for fifty-six years. It is fitting that Columbia University should preserve his name in one of its important buildings. He is among the truly greats of that institution.

Jean Louis Baudelocque, one of the important French obstetricians in the 18th century, was called Le Grande Bau-

delocque to distinguish him from two other eminent Paris obstetricians of that family name. He was born at Heilly in 1746 and received his earliest instruction in medicine from his father, a distinguished surgeon of Amiens. He also studied in Paris, afterward being admitted to the Royal College of Surgeons. He was at one time head of the Department of Midwifery at the Medical School of Paris and ably carried out the great teaching tradition established by Mauriceau and Levret.

Great credit must be given to Baudelocque for contributing a more exact knowledge of the dimensions of the pelvis in the living woman. He also added to the existing knowledge of the movements of the baby in the process of birth. Baudelocque had important and continued influence on American obstetrics through a translation of his *Midwifery*, published in Philadelphia in 1823 with notes, by William P. Dewees, Professor of Obstetrics at the University of Pennsylvania. He is known today by obstetricians everywhere through *Baudelocque's Diameter*, an external pelvic measurement.

Historians seem to be agreed that an important influence in 18th century British obstetrics was John Burton of York. He is without doubt the best known obstetrician in the literary world, for he was the prototype of Dr. Slop in Laurence Sterne's *Tristram Shandy*. Few doctors would choose this kind of immortality and in Burton's case it came through his own efforts in Yorkshire politics. Because of his prominence there he was subjected to religious and political persecution "and to the malignant enmity of Jacques Sterne and the mordant satire of his nephew." (Spencer). At one time Burton was arrested and imprisoned on suspicion of being in sympathy with the followers of Bonnie Prince Charlie.

John Burton was born in Colchester in 1710. He re-

ceived his M.D. at Cambridge in 1733 and also studied under Boerhaave at Leyden and under Gregoire at Paris, after which he settled in York, England. In 1740 he founded the York Hospital and was elected its first physician. He had a wide reputation as an able obstetrician and in 1751 he published his *Essay towards a Complete New System of Midwifery*. This work, while more erudite than any of its British predecessors, did not meet with the favorable response accorded Smellie's book, which appeared shortly afterward. This probably rankled in Burton's mind, for three years later he expressed his not uncertain opinion in *A Letter to William Smellie, M.D.*, a document of 233 pages octavo which attempts to smear Smellie and also the reviewer of Burton's own books, whom he designates as "your echo." As an 18th century controversialist Burton ran true to form, Smellie adding to his exasperation by taking no notice of him whatever.

Those familiar with *Tristram Shandy* will be interested to know that Burton's forceps can be viewed today at the library of the New York Medical Society (England) together with a note which states that Burton was the original of Dr. Slop and also that "The spectator is invited to believe that these are the identical instruments with which the great Tristram was ushered into the world, but not without detriment to the bridge of his most illustrious nose." These forceps are of the Dusée type and are not the forceps which Burton devised, "ingenious but very unservicable . . . working like a lobster's claw."

H. R. Spencer's concluding statement about Burton in his *History of British Midwifery* smooths the picture of him considerably:

For his public philanthropic work in York, for the

industry and learning evident in all his works, John Burton is worthy of honour. By bringing the knowledge of Midwifery before the profession in a work more full of learning than that of any of his British predecessors, even if it exhibited little originality or practical acumen, and especially by his splendid work, "Monasticon Eboracense," Burton has secured a perennial monument, and as Dr. Slop in "Tristram Shandy" he will survive as long as a love of literature lasts.



FROM *La Commare* (1642) BY SCIPIONE MERCURIO
From Thoms: *Classical Contributions to Obstetrics and Gynecology*

CHAPTER SEVEN

CESAREAN SECTION, THE GREATEST OPERATION

Cesarean section is not only one of the oldest operations in medical history; many have considered it the greatest in that it is the only one which involves two lives. The operation itself is not difficult to understand. Briefly, it is the opening of the abdomen by a midline incision, usually below the navel, four to six inches in length, large enough to allow the passage of a normal-sized infant. When this abdominal incision is made and the bleeding controlled, as is done in a matter of a few minutes, a second incision is made in the uterus, the muscular sac which contains the infant and which occupies most of the abdomen. When the uterus is incised a quantity of fluid, the "waters," escape. The child is grasped by the feet and delivered feet first with the head following after. The umbilical cord is now cut and the placenta is in essence scooped out through the incision. The final step is the suturing or sewing together of the edges of the two incisions, the stitches being placed in layers. The suturing is the most time-consuming part of the operation, but even so it is only a matter of minutes. When the abdominal incision is closed, dressings are applied and the operation is over.

Over the long years the development of this truly life-saving operation has often been the center of bitter

controversy. Indeed, it is only within the present century that it has changed from an emergency or last resort procedure, usually attended with failure, to the carefully planned and successful operation that we know today. This advance came along with other great improvements in surgery which followed the discovery of anesthesia and the work of Pasteur and Lister on the cause and prevention of infection.

The origin of the name is still obscure and probably never will be completely settled. The popular notion is that Julius Caesar was born into the world by this means, but we know that his mother was alive in his adult years and it does not seem likely that she would have survived any such birth experience. Another possibility is that the term is derived from the Latin verb *caedere*, meaning "to cut." A more plausible explanation than either of these is that the name comes from the Lex Regia of Numa Pompilius (715 B.C.), in which it was forbidden to bury a pregnant woman without first removing the child from her abdomen so that they might be buried independently. Under the rule of the emperors the Lex Regia became the Lex Caesarea. The transfer of this name to that of the operation seems a natural sequence inasmuch as in a few of these postmortem operations the child was undoubtedly born alive. At a much later date the postmortem cesarean section to try and save the child became a regular procedure when the mother died in labor. Among the ancient Hindus the postmortem operation was performed whenever after the death of the mother any signs of fetal movements were detectable.

That the operation was known in very ancient times is indicated by its use among primitive people today. A notable example was witnessed in 1879 in Uganda by Robert W. Felkin, an anthropologist. Five years after this he re-

ported his experience before the Edinburgh Obstetrical Society. The operation was done in Katura by a native on a twenty year old woman in her first pregnancy. She was first given banana wine to a stage of semi-intoxication and then fixed to a crude bed by bands of cloth over the thighs and thorax, the ankles being held by an assistant. The operator washed his own hands and the woman's abdomen with banana wine, and after the incision was made the bleeding was controlled by cauterization with a hot iron. The wound was brought together with thin iron pins and dressed with an herb paste, and a firm cloth binder was placed around the abdomen. By the eleventh day the wound was healed perfectly and the mother had made an excellent recovery.

Turning to a more bizarre aspect of successful cesarean section before the modern era, the record shows that there are a number of authenticated cases where women far advanced in pregnancy have been gored by the horns of bulls or cows in such a way that the child escaped through the wound and both mother and child survived.

According to some the first recorded instance of cesarean section performed on a living woman occurred in 1500 when Jacob Nufer, a sow gelder of Sigerhausen, Switzerland did the operation on his wife, who was unable to deliver herself in labor. Thirteen midwives are said to have been called in as well as some local surgeons who were lithotomists, or cutters for stone, usually stone in the bladder. When no help from this galaxy of talent was forthcoming, the husband applied to the mayor for permission to take matters into his own hands. This was granted and Nufer did the operation with a razor. The wife made a good recovery and later gave birth naturally to five other children.

One of the first references to cesarean section in medical books is that made by Jacques Guillemeau, surgeon to Henry IV and also a celebrated obstetrician. In his book, *Child-birth or the Happy Delivery of Women*, (1598) he devotes a chapter to cesarean section. He would not counsel anyone to do the operation and cited five instances, all done by experienced surgeons, in none of which the mother survived. But, in 1604 Scipio Mercurio, a surgeon of Padua, published a work called *La Commare Riccogliatrice*, in which he maintained that cesarean section should never be neglected in cases where delivery is otherwise impossible. He wrote, "When the foetus is extraordinarily strong, the passage narrow, the pubic bone flat, it is more than necessary to perform this operation because there is no other way out." Mercurio was the first to introduce the operation into Italy and the first to publish an illustration of the operation.

The first authenticated case of cesarean section intentionally performed was done April 21, 1618, by Trautmann of Wittenburg. This was recorded by an eye witness, Professor Sennert of that University. He wrote, "The gracious help of God was first of all implored — in addition to the Surgeon there were present the Archdeacon, two midwives, and several other honorable women." The operation was done because the woman had a large hernia which contained the pregnant uterus, making natural birth impossible. The mother died of infection twenty-five days after the operation, but the child survived.

The first successful operation in Great Britain was done in 1738 by a midwife who used a razor for the incision and sewed up the wound with silk using a tailor's needle. The mother made a good recovery and was able to walk a mile on the twenty-seventh day. The first British obstetrician to

write in favor of cesarean section was our old friend John Burton of York, Smellie's antagonist. In his book (1751) he went into more detail concerning the operation than did his predecessors, and he mentions several conditions under which delivery by the natural passages is impossible. In all these cases, he writes, "instruments are of no value and the only means we have of saving the mother is by cesarean section." And again, "to neglect to save a person when it is in your power to do so is accessory to his death and to decline the operation in this case is to be accessory to the death of two persons."

The impact of Burton's book was not to be compared with that of Smellie's great work published the following year. In it the Master of British obstetrics gave sound views for the performance of the operation. He warns, however:

If the woman is weak, exhausted from fruitless labor, violent floodings or any other evacuations which render her recovery doubtful, even if she were delivered in the natural way; in these circumstances it would be rashness and presumption to attempt an operation of this kind which ought to be delayed until the woman expires and then immediately performed with a view of saving the child.

At this time also, other leaders in obstetrical thought strongly opposed the operation on any grounds, as, Benjamin Pugh, in his treatise of 1754, where he said that he thought it was "very extraordinary indeed, and seems I think, to be sporting with lives."

James Barlow of Blackburn was the first British surgeon to perform an operation in which the mother recovered. This was on November 26, 1793. The patient was Jane Foster, aged about forty. On the tenth day after the operation, "She

ventured out of bed, on the 17th she began to attend to her domestic employment from which time until the present (September 23rd 1796), an interval of nearly three years, she has continued in health, menstruated with regularity, but has never been pregnant.”

Few subjects in medical history have created more bitterness and animosity than the quarrel between Cesareanists and Anticesareanists. One of the most intensive of these quarrels is that between Dr. John Hull and Mr. W. Simmons of Manchester, the notorious Hull-Simmons Controversy. In 1793 Simmons published a work entitled *Reflections on the Propriety of Performing the Cesarean Operation*. He commented upon the universal fatality of the cesarean section in England and cast doubts on French reports of success, saying, “I hope no Englishman will attempt to regulate his practice in this operation from foreign accounts of success, for I should pity his patients, without envying his credulity.” He concluded that the operation “can never be justified during the patient’s life and stands recorded only to disgrace the art.” This publication was attacked by Hull in a letter accusing Simmons of deliberate inconsistencies. The matter soon became a medical free-for-all in which many physicians were involved. It is not difficult to see something of both sides, for up to the end of the 18th century only two mothers had survived in nineteen recorded English operations.

The situation was but little better in the United States where early performances of cesarean section remain in obscurity. Even up to 1878 out of eighty operations forty-one had been fatal to the mother, a circumstance so bad that the reporter of the series, Dr. Harris, declared the operation was more successful when performed by the patient herself or

when the abdomen was ripped open by an infuriated bull.

In 1882 a revolution in technical procedure took place. A German surgeon named Max Sanger recommended the employment of uterine sutures to sew up the uterine incision as snugly as possible so that the uterine discharges could not leak into the abdominal cavity. In addition dilute carbolic acid was used in various ways as an antiseptic, and blood loss was checked by hemostatic forceps, much as it is today. In Germany these innovations were attended with remarkable success. In thirty-three operations up to March, 1887, twenty-nine mothers and thirty-two children were saved. In 1886 at a meeting of the British Medical Association, W.T. Lusk of New York spoke on the new technique and reported nineteen recoveries in twenty-six cases, the seven fatal operations having been done under hopeless circumstances.

It is not the purpose here to describe technical advances which have resulted in the present perfection of cesarean section, but some important landmarks need mention. They have been antiseptics first, followed by aseptic techniques, improvements in anesthesia, and better hospital and nursing care. Added to these in recent years has been the use of the new antibiotic drugs to prevent and combat infection. Today cesarean section is one of the safest of abdominal operations, though there are limitations. The results can never be perfect if there has been neglect in prenatal supervision either by the doctor or by the patient herself, or if the operation is performed so late in labor that the patient has lost too much blood or is too exhausted, or if infection is present which does not respond to antibiotic therapy. Any of these things can and occasionally do happen. If cesarean fails under such circumstances it is usually no

fault of the operation or of the operator. But no matter where the blame, the operation should be performed even in desperate circumstances.

All abdominal operations carry a minimal risk even in the most favorable circumstances, as every surgeon acknowledges. Because of this every cesarean section should have definite indications for its performance. This means that no woman should be allowed to choose abdominal delivery for reasons of her own. Cesarean section is one of the safest surgical operations today when it is performed on women who have had adequate supervision and many institutions have reported series running into the hundreds without a single maternal death.

CHAPTER EIGHT

THE FIGHT FOR OBSTETRIC ANESTHESIA

Queen Victoria was delivered of Prince Leopold, her eighth child, on April 7, 1853. Her obstetrician was Sir James Clark, M.D., and Dr. John Snow was also there as anesthetist. The event has historical significance because Her Majesty was the first queen to receive the benefits of anesthesia in childbirth. Chloroform was administered, the inhalation lasting fifty-three minutes. It was given intermittently over this time and induced what is known as "obstetrical analgesia," that is, relief of pain while consciousness remained. The Queen expressed herself as pleased with the effect.

Sir James sensed the importance of the event in encouraging the use of anesthesia for childbirth. He wrote shortly afterward to Prof. James Y. Simpson of Edinburgh, discoverer of the anesthetic properties of chloroform, "I know this information will please you and I have little doubt it will lead to a more general use of chloroform in midwifery practice in this quarter than has hitherto prevailed."

The first application of inhalation anesthesia to childbirth was made by Simpson on January 19, 1847, and announced two months later in a paper on the *Inhalation of Sulphuric Ether in the Practice of Midwifery*. It is an interesting historical fact that less than three months after Simpson's first use of it Dr. Nathan C. Keep, a Boston dentist



SIR JAMES YOUNG SIMPSON, 1811-1870
From a bust in St. Andrew Chapel, Westminster Abbey
Photograph by the Author

who had been using ether in his practice for some time, administered it in a case of labor.

Simpson immediately began to seek for another type of anesthetic which would not have the irritant qualities of ether. He consulted chemists about drugs known mostly as laboratory curiosities which he and his assistants might use for experiment. The suggestion to try chloroform came from a Mr. Waldie in Liverpool. The record tells us that late in the evening on November 4, 1847, Simpson, with two friends, Drs. Keith and Duncan and others, sat in his dining room at 52 Queen Street. Having inhaled several substances without effect Simpson decided to try a liquid which was much heavier than the others, namely, chloroform. Laing Gordon writes:

With each tumbler newly charged, the inhalers resumed their vocation. Immediately an unwonted hilarity seized the party—they became bright-eyed, very happy and very loquacious — expiating on the delicious aroma of the new fluid . . . But suddenly there was a talk of sounds being heard like those of a cotton mill louder and louder; a moment more then all was quiet — and then crash! On wakening, Dr. Simpson's first perception was mental, 'This is far stronger and better than ether', said he to himself. His second was to note that he was prostrate on the floor, and that among the friends about him there was both confusion and alarm.

Simpson made an immediate trial of chloroform on his patients and by November 10 had already used it several times. On the fifteenth he stated that he had given chloroform to about fifty individuals without the slightest bad result, some of the subjects being surgical cases. Although he was convinced that chloroform was the ideal anesthetic and fought for its use over that of ether, his real fight was with those

who objected to anesthesia itself. There were many who opposed it on medical grounds, stating that it increased the mortality of surgical procedures and also the incidence of hemorrhage, convulsions, pneumonia, paralysis and even mental derangement.

Many professional opponents of anesthesia were especially set against its use in childbirth. Pain in childbirth, they maintained, was "a desirable, salutary, and conservative manifestation of life force." In the forefront of the American opposition was Dr. Charles D. Meigs of Philadelphia, also known as Holmes' chief antagonist in the puerperal fever controversy. He seems to have had a propensity for getting on the wrong side of medical controversies, a fact which has greatly obscured his true eminence as a teacher of obstetrics. Simpson addressed himself principally to Meigs and said:

I do believe that if imperfectly and incautiously given and in some rare 'idiosyncrasies', ether or chloroform may prove injurious or even fatal just as opium and calomel and every other powerful remedy and strong drug will reasonably do. Drinking cold water itself will sometimes produce death.

Such drugs as mercury and quinine, he continued, had met with stubborn resistance before their virtues were generally accepted; and opponents of vaccination had long claimed that it was a violation of religion, smallpox being plainly ordained by heaven. A leading Dublin obstetrician wrote: "the feeling was very strong against its use in ordinary cases, merely to avert the ordinary amount of pain, which the Almighty had seen fit — and most wisely, no doubt — to allot to natural labour; and in this feeling he [the writer] most heartily concurred." Simpson adroitly parodied this letter:

I do not believe that anyone in Dublin has yet used a carriage in locomotion; the feeling is very strong against its use in ordinary progression, merely to avert the ordinary amount of fatigue which the Almighty has seen fit — and most wisely no doubt — to natural walking; and in this feeling I heartily and entirely concur.

Simpson demonstrated what is well known today, that the proper use of anesthesia and anesthetic agents often shortens labor by diminishing excessive pain, and speeds recovery. His use of statistics to prove his thesis greatly aided his struggle against members of his own profession, but this sort of evidence was of little value in countering religious objections to the use of anesthesia in childbirth.

However foolish these objections may seem to us today, they were powerfully urged at the time by clergy and laity alike. It is pleasant to record, however, that Thomas Chalmers, the great Scottish divine, declared the question of anesthesia had no theological aspect and advised Simpson to take no notice of “small theologians” who opposed its use. The principal basis of the religious argument was the primeval curse upon woman in Genesis 3:16, which says in part, “Unto the women he said . . . in sorrow thou shalt bring forth children.” Simpson countered this with reference to the original Hebrew text, saying that the word “sorrow” was the same one applied to man, *viz*, “in sorrow thou shalt eat of it all the days of thy life.” *i.e.*, labor, toil, physical exertion. He also pointed out that in other parts of the Bible an entirely different Hebrew word was used to express pain in childbirth.

Simpson’s most telling argument from the Bible was Genesis 2:21: “And the Lord God caused a deep sleep to

fall upon Adam; and he slept; and He took one of his ribs and closed up the flesh instead thereof." Most of the theologians with whom he had to deal found that Simpson's knowledge of Holy Writ was greater than their own.

Thus it was that Simpson must have felt his victory was really complete when in April, 1853, he received Sir James Clark's letter informing him of the Queen's satisfaction with her use of chloroform. The bestowal of a baronetcy upon him in 1866 was the first honor of its kind ever conferred upon a doctor or even a professor in Scotland. One of the literary wits of the day came forward with the suggestion his coat of arms should carry the image of a newborn baby and bear the motto, "Does your mother know you're out?" — a quip which Sir James was probably among the first to enjoy.

Sir James Young Simpson remains today one of the great men in modern medicine. He started life as one of seven sons of a village baker in Bathgate, Scotland, in 1811. He received his M.D. in 1832 from the University of Edinburgh and in 1839 he was appointed to the chair of midwifery at the age of twenty-nine. He has been referred to as the Father of Gynecology for his pioneer work in that specialty. He was also noted as an antiquarian and wrote three volumes on historical subjects. One authority says of him: "By his achievements and mental power he claims the association in medical science with Harvey, Jenner and Lister." His bust in Westminster Abbey acclaims him as the man "To whose genius and benevolence the world owes the blessings derived from the use of chloroform for the relief of suffering. *Laus Deo.*"

The story of the fight for anesthesia in our own country is no less inspiring, for the struggle was equally intense.

Here, too, it was characterized by unintelligence, bigotry, and religious intolerance. What Simpson did for Britain, Dr. Walter Channing of Boston did for America.

Walter Channing was one of three illustrious brothers. His elder brother William Ellery Channing is famous as a clergyman, author, and philanthropist and a founder of the Unitarian movement. His younger brother, Edward T. Channing, was professor of rhetoric at Harvard for thirty-two years. Walter Channing received his M.D. from Pennsylvania in 1809 and in 1818 was given a full professorship at Harvard in obstetrics and medical jurisprudence, a position which he held until 1854. In 1816 he was made the first dean of the Harvard Medical School.

Shortly after ether was introduced at the Massachusetts General Hospital he became interested in its application to childbirth, and it was through his influence more than any other that its use became known in this country. As in Britain, not only the clergy and laity but many members of the medical profession as well were unyielding in their attitude toward any such innovation. Channing's greatest contribution was his *Treatise on Etherization in Childbirth*, published at Boston, 1848. In its preparation he circularized many physicians, so that in addition to his argument he was able to present the results of anesthesia in 581 cases of childbirth.

The same religious opposition that Simpson faced abroad was equally determined here. Channing's essential argument in meeting these opponents was that the application of agents of nature for the relief of pain was also the use of God-given means by God-given powers. His old teacher, Dr. Benjamin Rush of Philadelphia, had believed that "pain does not accompany childbirth as an immutable decree of heaven,"



Courtesy of Mr. Walter Channing, Boston, Massachusetts

WALTER CHANNING, 1786-1876
Portrait by Ames

and expressed the hope "that a medicine would be discovered that should suspend sensibility altogether, and leave irritability or the power of motion, unimpaired, and thereby destroy labor pains altogether."

Professor Meigs was much more urbane to Channing in the argument over anesthesia than he was to Holmes in the puerperal fever controversy. In a letter dated April 26, 1848, he wrote: "It is so clear that you have many distinguished names to sustain the practice now common in Boston, that I could almost feel ashamed not to be on your side also . . . We both seek the truth, I hope that you may find and establish it." Channing did indeed live to see most of his pioneering efforts become established.

Another book of which Channing was the author must be mentioned. This is his *Physician's Vacation*, a fine account of European travel a century ago and a splendid portrayal of Dr. James Simpson, at whose home Channing stayed while in Edinburgh. On one occasion these two took a trip through the Scottish lake region where Simpson made some professional calls. Channing was sixty-six at the time, while Simpson was but forty-five. However, they were kindred spirits in many ways; both had an abiding sense of humor, and they loved amateur theatricals and house parties. Channing was greatly impressed with Simpson's archeological and antiquarian knowledge. He was also amazed at the amount of professional work that Simpson accomplished, patients coming to him literally from all over the world. Channing himself was noted for his knowledge of Biblical literature and Shakespeare. On one occasion he read the part of Macbeth in public, with Fanny Kemble reading that of Lady Macbeth. He had one son, William Ellery, who became an editor and wrote a life of Thoreau, with whom he was an intimate.



N. C. Keep

NATHAN COOLEY KEEP, 1800-1875

From R. L. Hapgood: *History of Harvard Dental School*, Boston 1930

Before leaving these principal personalities in the fight for anesthesia we return to Dr. N. C. Keep, who recorded the first ether administration in childbirth in the United States. He was a physician as well as a dentist and received an M.D. from Harvard in 1827. To him the Harvard Dental School owes its existence. He was the first Dean of the Dental School Faculty and is remembered as one of the great pioneers in American dentistry. He has a less academic claim to remembrance as the chief witness in a famous murder trial. It was upon Keep's testimony that Professor Webster of Harvard was convicted of a murder of his colleague, Professor Parkman. After the murderer had killed his victim he burned the body in a furnace. The only thing that withstood the flames was a set of porcelain teeth. Some years before, Dr. Keep had made a set for Parkman, and when the molds for them were produced in court they proved the ultimate dramatic evidence which convicted Webster.

In the field of anesthesia the poet-physician Holmes also has claim to fame. It was he who coined the word "anesthesia" meaning "without feeling," from the Greek. The word "analgesia" also comes from the Greek; it means "without pain." In its ordinary usage, general anesthesia implies loss of consciousness. The term "analgesia" is used to express loss or abatement of pain with consciousness retained. An example is seen in gas-oxygen analgesia, which is the result of giving this gas intermittently in labor, relieving pain with consciousness largely remaining. If given continuously, anesthesia results; the patient is put to sleep. On the other hand we do speak of local anesthesia, where consciousness is unaffected.

There is no ideal drug for the relief of pain in child-

birth. This is because of the varied demands in different phases of labor. It is therefore useful to employ different drugs, often in combination. Such medications are given in different ways, by mouth, by hypodermic injection, by rectum, by injection into the tissues, by inhalation and intravenously.

The important drugs used in childbirth are not unfamiliar to most people. Among the sedatives are Nembutol, Seconol, Sodium amytal, Phenobarbital, which may be used alone or in combination with other drugs. Opiates are often used, particularly Demoral, which has a morphine-like action and is being used more and more in its place.

An important category of drugs is that of amnesic drugs. These are used to produce amnesia, or loss of memory. Scopalomine is the best example and it is usually given in combination. As we have mentioned above, the most widely used analgesic given by inhalation is nitrous oxide gas, which is also used for anesthesia. Ether, ethylene, cyclopropane are all gases and chiefly used for general anesthesia. Local or regional anesthesia represented by procaine (novocaine) is used to inject into the tissues of the birth canal, in this way blocking certain nerves that supply the region. Another method of producing regional anesthesia in childbirth is by injecting an anesthetic solution into the bony spaces at the lower end of the spine. This is called caudal anesthesia.

There are other drugs and other methods of administration, but from what has been said it can be seen that the obstetrician and the anesthetist are well supplied with measures to abolish or relieve pain in childbirth. The success of such medications depends not only upon the dexterity of administration but upon the evaluation of the individual needs of the woman in labor, of her attitude toward the

event, of her susceptibility to pain, of the stage and progress of her labor and also the condition of the baby.

It can be said with certainty that with modern medical and nursing training and modern hospital equipment at her disposal any woman who is anticipating the pain of labor with fear and trepidation is indulging in foolish and harmful thinking. (No accredited obstetrician today accepts the idea that prolonged or excessive pain serves any useful purpose.) The woman who is anticipating childbirth, who is taking the opportunity through classes or reading to inform herself about it and who has confidence in her doctor, who is not afraid to ask questions or make her wants known, has no need to cross any pain-bridges until they are met. The chances are greatly in her favor that when she comes to them they will be little ones and not too difficult to traverse.

SOME
15
GOOD?

CHAPTER NINE

THE CONQUEST OF CHILDBIRTH FEVER

In all medical history there is no more dramatic episode than that which occurred at the Academie de Medicine in Paris in March, 1879, during a discussion of the cause of puerperal, or childbed, fever. At the time, one of the speakers, Hervieux, was contrasting epidemic puerperal fever, which he called a miasm, with "microorganisms which are widely distributed in nature and which after all, appear fairly inoffensive since we constantly live in their midst without being thereby disturbed." Seated in the audience was the chemist, Louis Pasteur, who being irritated by the word "miasma" interrupted the speaker saying, "None of these things cause the epidemic, it is the nursing and medical staff who carry the microbe from an infected woman to a healthy one." Hervieux replied that he feared any such microbe would never be found, at which Pasteur went to the blackboard and drew a line of small dots saying: "There, that is what it is like." These tiny marks were the first public demonstration of the bacterial cause of puerperal fever. For Pasteur it was the beginning of a fight which was to be long and bitter, and he was to say again and again: "I shall force them to see; they will have to see." The eventuality we know.

Childbirth fever or puerperal infection is a disease of antiquity. The earliest of the medical writers were familiar

with it and described the symptoms unmistakably. The great Hippocrates, four centuries before Christ, wrote excellent case reports and thought the disease was due to a damming back of the uterine discharges following childbirth. To a considerable extent he was right, for when these discharges do not have free drainage infection is more apt to gain a foothold.

The epidemic nature or spread of the infection was not mentioned by the early writers, but when maternity hospitals came into being its horrifying potentialities became manifest. At one time in one Paris hospital seven out of ten women died before the epidemic subsided. This is understandable today when we learn that infected and healthy women were often put together in the same bed. In London, Dublin, Edinburgh, Vienna there were times when the story was similar, and on occasion even worse. Hospitals were sometimes forced to close their doors before such an epidemic could be stopped.

Puerperal infection is usually caused by an organism known as the streptococcus, a tiny bacterium which forms itself into lines or chains as shown by Pasteur. This organism is widespread in nature, being found on the skin and in the alimentary tract of healthy persons. Because of this, infection can occur without necessarily being carried from a sick woman to a healthy one. The prevention of puerperal infection calls for scrupulous cleanliness, that is, the use of strict surgical techniques during childbirth and in the after-period. Today in hospital practice when puerperal infection occurs, which is rarely, its control and cure is practically assured by the use of modern antibiotic drugs.

The conquest of puerperal fever is one of the great triumphs of scientific medicine. The story is chiefly centered

about four individuals, who rightly belong beside the great Pasteur in the struggle. These are Charles White of Manchester, England, Alexander Gordon of Aberdeen, our own Oliver Wendell Holmes, and Ignaz Philipp Semmelweis of Vienna. The first of these, Charles White, was born in Manchester in 1728, the son of Dr. Thomas White, a general practitioner and man-midwife or obstetrician who is said to have performed the first cesarean section in the North of England. Charles studied with his father and then took a course in anatomy in London under the great William Hunter. John Hunter, William's brother, with whom he formed a life-long friendship, was a classmate. On returning home he was instrumental in founding Manchester Royal Infirmary and the Lying-in Charity, now St. Mary's Hospital. Charles White, as he emerges through his writings, appears today a doctor's ideal in obstetrics. His brilliant reasoning and deep understanding of the woman in childbirth come to us with a freshness reminiscent of the sunshine, fresh air and cleanliness which he insisted upon in his own maternity ward. His book, which was to have such wide influence, was published in 1773 and was called *A Treatise on the Management of Pregnant and Lying-in Women*. Through its descriptions it gives a remarkable picture of what was going on at that time in the care of women in childbirth and also of the striking changes that he brought about. These were some of the conditions with which he had to deal:

If the woman's pains are not strong enough, her friends are generally pouring into her large quantities of strong liquors, mixed with warm water, and if her pains are very strong, the same kind of remedy is made use of to support her. As soon as she is delivered, if she is a person in affluent cir-

cumstances, she is covered up close in bed with additional cloaths, the curtains are drawn round the bed, and pinned together, every crevice in the windows and door is stopped close, not excepting the keyhole, the windows are guarded not only with shutters and curtains, but even with blankets, the more effectually to exclude the fresh air, and the good woman is not suffered to put her arm, or even her nose out of bed for fear of catching cold. She is constantly supplied out of the spout of a tea-pot with large quantities of warm liquors, to keep up perspiration and sweat, and her whole diet consists of them. She is confined to a horizontal posture for many days together, whereby both the stools and the lochia are prevented from having free exit.

To combat this state of affairs Charles White insisted on general cleanliness and airiness of the room and isolation of the patient when infected. Most of all he demonstrated the importance of uterine drainage, making the patient sit up in bed early after delivery and get up and around on the second or third day at the latest. Out of his extensive experience he was able to say that while cases of puerperal fever had occurred among his patients, he never lost a single woman from this disease. His recommendations, 'most of which were distinct innovations, are seen partially in the following:

Her lying-in chamber is to be in every respect as sweet, as clean, and as free from any disagreeable smell as any other part of the house . . . The room is to be brushed every day, and the carpets to be taken out to be cleaned and aired . . . The patient is to be often supplied with clean linen, and clean well-aired sheets are to be laid upon the bed . . . The windows are to be opened . . . no board or

other contrivance to block up the chimney, the curtains not to be closely drawn . . . In hospitals, if separate apartments cannot be allowed to every patient, at least as soon as the fever has seized one she ought immediately to be moved to another room, not only for her immediate safety, but that of other patients, or it would be still better if every woman were delivered in a separate ward and was to remain there a week or ten days until all danger of this fever is over. The diet is to be simple, the bowels to be kept open and alcohol is to be eschewed. Whenever a patient has recovered from this fever and is removed to another room, the bedding and curtains should be washed, the floor and woodwork should be cleansed with vinegar, and it would add to the salubrity of the apartment if it were stoved with brimstone [*i.e.* fumigated with sulphur].

This was a whole century before the real cause of puerperal fever was known and before the science of bacteriology was even imagined. Charles White had important influence in his day and beyond, despite limited means of communication. One of the men on whom this influence worked was Robert Collins, the Master of the Rotunda Hospital in Dublin from 1826 to 1833. Collins adopted White's methods, which included scrubbing the floor with chloride of lime solution and exposing blankets, quilts and linen to chlorine gas over a twenty-four hour period. Of 10,785 patients delivered only fifty-eight died, all from other causes than puerperal fever.

In an obituary memoir of White, who died in 1813, Dr. Thomas Henry recognized the importance of his great book: Perhaps, indeed, few medical books have been productive of more reform in practice, or of more

comfort and safety to the subjects for whose benefit it was intended. Nature was restored to the free exercise of her operations, and officious ignorance was prevented from converting into fatal disease what was benevolently and wisely designed to be a process scarcely ever attended with danger.

These are truly wise words, but only within our time are they beginning to be generally appreciated. White, Gordon, Holmes, Semmelweis, all gave to the world the great truths about the dread disease puerperal infection, but in no instance were their words taken serious by the medical world until years after they had been uttered.

Charles White's career in medicine was essentially a happy one. Not only was he able to see the immediate results of his reforms, but he was rightly acclaimed as one of the foremost surgeons in his day. Unfortunately there was no such happy ending for the next man on our list, Alexander Gordon of Aberdeen, who must be honored as the first to demonstrate clearly the infective nature of puerperal fever. Gordon was born in 1752 in a small parish not far from Aberdeen. He took the degree of Master of Arts from Marischal College, Aberdeen, and graduated in medicine at the University of Edinburgh. He served for a time as a surgeon's mate in the Royal Navy. Three years later he became a resident pupil at the Lying-in Hospital, Store Street, London, later becoming a student at the Middlesex Lying-in Dispensary. In London he attended lectures by the leaders of that day on midwifery and surgery, and he was a highly qualified obstetrician when he returned to Aberdeen and was appointed physician to the dispensary which had been founded "for the purpose of attending in their own homes such patients as could not be admitted to the infirmary."

Gordon published his famous *Treatise on the Epidemic Puerperal Fever* in 1795. In the preface he opens his heart as he writes:

The benevolent reader must observe, with displeasure, the ungenerous treatment which I met with from that very sex whose sufferings I was at so much pain to relieve; for, while I was using my best endeavors to mitigate the calamities of many miserable sufferers, several others were very busy traducing my character, who, prompted by prejudice, very uncandidly proclaimed the deaths, and concealed the cures, on purpose to raise an odium against my practice.

The definite infectiousness of puerperal fever finds itself strikingly put forth in one paragraph of his book which later greatly impressed O. W. Holmes.

By observation, Gordon writes:

I plainly perceived the channel by which it was propagated and I arrived at that certainty in the matter, that I could venture to foretell what women would be affected by the disease, upon hearing by what midwife they were to be delivered or by what nurse they were to be attended during their lying-in; and in almost every instance my prediction was verified.

With the fortitude befitting a countryman of John Knox he writes: "the midwife who delivered Mrs. K— carried the infection to No. 55 in Nigg, a country parish not far from Aberdeen from whom it spread through the whole parish." It is small wonder that Alexander Gordon was not popular with the midwife sorority.

Let us make no mistake about the soundness and importance of Gordon's observations and conclusions. He not

only carefully noted the spread of the disease; he went further and described accurately the anatomical changes in the victim and gave rules for preventing it. One paragraph alone in the *Treatise* immortalizes him:

And if in the dissection of a putrid body a surgeon scratch his finger, the part festers, that is inflames and suppurates; and if a fever should be the consequence, it is inflammatory in the beginning and only ultimately putrid . . . In like manner if putrid material be applied to the uterus, it inflames that organ and the contiguous viscera; that is, it gives rise to the puerperal fever, which is ushered in with a cold stage and succeeded with a very rapid pulse and acute pains in the abdomen.

Regarding prophylaxis Gordon writes:

The same means ought to be practiced for preventing the infection of puerperal fever. The patient's apparel and bed-clothes ought either to be burnt or thoroughly purified; and the nurses and physicians who have attended patients affected with puerperal fever ought carefully to wash themselves and get their apparel properly fumigated before it be put on again.

Like Holmes, Semmelweis, and Pasteur, all of whom came after, he knew the truth that could save countless lives, but like them also he received for his pains chiefly abuse and calumny. Not long after the publication of the *Treatise*, Gordon was called again to active duty in the Navy. It was probably a welcome assignment. After nearly four years he became ill and was invalided home. He died of pulmonary tuberculosis in October, 1799, at the age of forty-seven.

The next chapter in this story has a more pleasant ending, for Oliver Wendell Holmes lived long enough to see



Courtesy of Houghton, Mifflin Company

OLIVER WENDELL HOLMES in 1850

From *Life and Letters of O. W. Holmes*, J. T. Morse, Boston, 1896

most of the things he and the others fought for become established.

Oliver Wendell Holmes was born in Cambridge in 1809. He graduated from Harvard in 1829 and spent a year studying law before entering the Harvard Medical School. He took time out to spend three years of study at Paris and Edinburgh and returned to take his medical degree in 1836. He began to practice in Boston the same year. Two years later he was appointed professor of anatomy at Dartmouth and later delivered lectures at the Berkshire Medical Institution at Pittsfield. In 1847 he became the first Parkman Professor of Anatomy and Physiology at Harvard, a position which he held for the next thirty-five years. Holmes' deep interest in puerperal fever probably began about 1840 at a medical discussion in Boston concerning the death of a colleague who had made a postmortem examination of a puerperal fever victim and who himself had become infected and died a week later. In the meantime, this unfortunate doctor had attended several women in confinement, all of whom were attacked by puerperal fever. This distressing circumstance stimulated Holmes to investigate all the evidence he could gather about puerperal fever. By letter and word he sought out the facts in local cases which pointed to the spread of the disease, reasoning that if the disease prevailed in a single locality it must be due to a local cause. He argued against the element of chance, saying: "It is not chance that accounts for a single practitioner having sixteen fatal cases in a single month . . . There is therefore some relation of cause and effect between the physician's presence and the patient's disease."

Holmes first published his observations in a somewhat obscure publication, *The New England Quarterly Journal of*

Medicine and Surgery, and not much attention was paid to it. This was in April, 1843. A decade later, being more convinced than ever that he was right, he republished his essay, emphasizing his warning that a doctor stay away from maternity patients if he finds a patient attacked by the disease until it has been proved that some other source of the infection has been found. Holmes did not base his argument solely upon his own findings, but quoted the experience of White, Gordon and others who believed in the contagiousness of puerperal fever. However, high authorities in the American obstetrical world not only opposed Holmes but ridiculed him. The most famous of his opponents were Professors Meigs and Hodge of Philadelphia, both leaders in that day. Meigs stated that he preferred to attribute the deaths to accident or Providence, and Hodge begged his students to divest their minds of the dread that they could ever carry the horrible virus.

The extraordinary treatment of Holmes by these two men gives added charm to the utterances which accompanied his essay in 1855. His appeal for consideration is touching as he writes:

I take no offense, and attempt no retort; no man makes a quarrel with me over the counterpane that covers mother with her newborn infant at her breast. There is no epithet in the vocabulary of slight and sarcasm that reaches my personal sensibilities in such a controversy . . . The teachings of the two professors in the great schools of Philadelphia are sure to be listened to not only by their immediate pupils but by the profession at large. I am too much in earnest for either humility or vanity, but I do entreat those who hold the keys of life and death to listen to me also for this once.

It is interesting to note that the reception of the original essay was favorable in Europe as early as 1844. Sir William Osler once asked Holmes whether he had derived the greater satisfaction from the essay on puerperal fever, or the poem, "The Chambered Nautilus." The reply was, "There is more selfish pleasure to be had out of the poem, perhaps a nobler satisfaction from the life-saving labor." Later Holmes wrote to Osler:

But I think I shouted my warning louder and longer than any of them, and I am pleased to remember that I took my ground on the existing evidence before the little army of microbes was marched up to support my position. I defended my position with new facts and arguments and not without rhetorical fervor at which after looking down for half a century I might smile if I did not remember how intently and with what good reason my feelings were kindled into the heated atmosphere of superlatives.

At eighty years of age Holmes still could use his literary talent to superb effect. His essay on puerperal fever remains the finest and most important monograph ever written by an American doctor. It is with proper appraisal that Holmes has been called "the most successful combination which the world has ever seen of the physician and the man of letters."

"In the history of midwifery there is a dark page and it is headed, 'Semmelweis.'" This was written by a contemporary of Ignaz Philipp Semmelweis, who, like many other great benefactors of mankind, did not live to see his work accepted. Although his story is a somber one it is also inspiring, for it tells of one whose whole life was devoted to the search for truth.

Called the Immortal Magyar, Semmelweis was born in

Budapest July 1, 1818, the son of a prosperous shopkeeper. He spent two years at the University of Pesth, and at nineteen went to Vienna to study law. He was dissatisfied with this and changed to medicine, taking his M.D. degree in 1844. The same year he took an assistantship in the Lying-in Hospital and was given a degree of Master of Midwifery.

Just before Semmelweis's time the Lying-in Hospital was divided into the First and Second Clinics, one for medical students and one for midwives. The second year after graduation Semmelweis became full assistant to Professor Klein, the chief of the hospital. At that time the maternal mortality in the First Clinic was always about four times that of the Second. The opportunity afforded Semmelweis of comparing conditions in the two clinics was an important factor in solving the problem of puerperal fever.

One of the duties of the young assistant was to visit and examine all of the new patients early in the morning and to report to his chief on his arrival in the wards.

In 1846 there were 459 deaths from puerperal fever alone in the First Clinic compared to 105 in the Second, and even this appalling figure does not tell the whole story, for often cases of puerperal fever in the First Clinic were transferred to the general hospital where the patients died, but were not recorded as dying from puerperal fever. Semmelweis was greatly impressed by these figures and spent his whole time studying the situation — in the library, in the autopsy room, and at the bedside.

The reputation of the First clinic was so bad that many heartrending scenes occurred when women found they had been assigned to that division instead of the school for midwives. Added to the horrors of the place were religious ceremonies where priests in their robes, preceded by an

attendant ringing a bell, went all through the wards to administer the sacrament to a sick woman. Semmelweis recorded, "Even to me myself it had a strange effect upon my nerves when I heard the bell hurried past my door; a sigh would escape my heart for the victim that once more was claimed by an unknown power." Semmelweis accordingly arranged with the priests to get rid of the bell and take a more direct way to the sick woman.

One group of women in the clinic interested Semmelweis, namely, the mothers of so called street-births. These were births that took place usually on the way to the hospital, in halls, doorways, and similar places. It was noted that these women were singularly free from puerperal fever. In the First Clinic, too, several women in contagious beds sickened about the same time, while in the Second the cases were always scattered.

A circumstance that greatly affected Semmelweis's thinking was the death of his colleague Kolletschka from blood poisoning which started in the puncture of a finger by a dissecting scalpel. Semmelweis was convinced from the findings in the case that this death was caused by the same disease that he knew as puerperal fever. He wrote, "Day and night the vision of Kolletschka's malady haunted me, and with ever increasing conviction I recognized the identity of the disease from which Kolletschka died with the malady I had observed to carry off so many lying-in women." At this time he also asked himself, "Did the individuals whom I have seen die from an identical disease also have cadaveric material carried into the vascular system? To this question I must answer Yes!"

Owing to the system of teaching at the hospital, professors, assistants, and students had frequent reason to come

in contact with the cadaver. Semmelweis sought means by which any such material adhering to the hands could be destroyed. About May, 1847, he began to insist on the use of chloride of lime solution as a disinfectant following the washing of the hands. The result of this simple innovation was that in the year 1848 only forty-five women died out of 3556 patients in the First Clinic, while there were forty-three deaths out of 3219 in the Second. In March and August of that year there no deaths at all in the First Clinic.

For Semmelweis this established three things. It explained his observations about street-births, it accounted for the low Second Clinic mortality where neither teachers nor pupils came in contact with the cadaver, and it fixed in his mind the hypothesis that puerperal fever was caused by any kind of decomposed animal organic matter, whether from a living person affected with the disease.

With the miraculous results that Semmelweis obtained it would appear that no further proof of his doctrine would be necessary. But, as has been said, men seldom really change their minds; they simply rearrange their prejudices. The big-wigs in the obstetrical world were not ready to accept any such radical change in thinking. Semmelweis himself acted foolishly in the matter. Thinking that his doctrine would in some way carry itself forward he did nothing about publication, although friends pleaded with him to do so. When in 1861 he finally did publish his book, it was too long and wordy and greatly in need of editorial revision. What William Sinclair said was eminently true: "If Semmelweis could have written like Holmes his *Aetologie* would have conquered Europe in twelve months."

The turning point in Semmelweis's career came in 1850 when for no very good reason he returned to Budapest. Here he took a nonpaying position as honorary senior physician at

St. Rochus Hospital, and with his reforms there reduced the maternal mortality in one year to less than one per cent. In July, 1855, he was appointed professor of Theoretical and Practical Midwifery at the University of Pesth. The very first year of his professorship the mortality in his clinic was reduced to 0.39 per cent, lower than that achieved in any clinic in the world. He now had two successful demonstrations in Budapest, but still he abstained from giving his doctrine authentic publication. Strange to say, his most severe critics and scoffers came from the very places where he might have expected acceptance, Austria and Germany. In the latter country even the great Virchow, the father of cellular pathology, believed that weather conditions had much to do with the epidemic of puerperal fever. Semmelweis's handling of Virchow is characteristic of his intense feeling at this time. He wrote in his book:

To say nothing of my students, of medical practitioners and surgeons, there are at present 823 of my pupil midwives carrying on midwifery practice in Hungary, who know better than Virchow why the majority of epidemics of puerperal fever occur in winter, who know better than Virchow what to do in order to prevent puerperal fever . . . who, more enlightened than the members of the Berlin Obstetrical Society, would laugh in derision at Virchow if he gave them a lecture on epidemic puerperal fever.

To make matters more discouraging, Semmelweis's book was almost universally ignored. The result was that he began writing open letters with scathing accusations, denouncing one man before God and the world as a murderer. In 1863-64 the initial steps of a final mental deterioration began to be manifest. His letters became even more abusive, one being addressed to all professors of obstetrics. The end came in

1865 shortly after he was admitted to a sanatorium. At that time one of his doctors noted an infected wound in the middle finger of his left hand and "as if Fate had decided to write with a pen dipped in irony," Semmelweis died from the same type of infection as did Kolletschka, in whose death he had seen revelation.

Following Semmelweis's death the doctrine made very little progress until the justification of his work came through Pasteur, who discovered the bacteria which were the primary cause of puerperal infection. The final evidence was supplied by him when he found the streptococcus in the discharges of dying women and also in the blood stream.

If we look at the situation today we find that puerperal infection, instead of being number one on the list of killers of women in childbirth, is number four; heart disease, hemorrhage, and pregnancy toxemia all are more potent. These figures on puerperal infection from one large American hospital tell the story: From 1929 to 1949 there were 46,093 live births; for the first eight and a half years there were 17,916 births with 40 maternal deaths from infection, in the last nine and a half years out of 28,177 births there were but four maternal deaths from infection. Puerperal infection is no longer feared by those who attend woman in childbirth, but it is greatly respected, and vigilance in maintaining rigid surgical cleanliness is never allowed to slacken.

Historians often have blind spots. This has been particularly true with the history of puerperal fever. Some have chosen one single hero of the fight, as has been done in the story of anesthesia, and much useless and futile argument has resulted. The five men whom we have discussed form a noble company. They owed much to one another, and medicine is proud to claim them all.

CHAPTER TEN

SOME IMPORTANT DISCOVERIES

Many of the improvements in obstetrics have come through discoveries in other fields of medicine. Advances in surgery have led directly to improvements in obstetric operations. Improvements in medical diagnosis and treatment likewise have been applied to obstetrical problems. Pregnancy can be complicated not only by conditions peculiar to itself but by unrelated accident or disease. For this reason the skills demanded of the obstetrician are greatly varied and call for knowledge and judgement to a degree unsurpassed in other medical fields.

Discoveries in medicine follow a general rule of science. In the great majority of instances they are made by those with prepared minds who make careful observations. Accidental discoveries do occur, but they are rare indeed. The important discoveries in obstetrics adhere to the general rule, for the physicians who made them were men of high professional attainments and wide experience. Such a one was Dr. John Stearns, who as a country practitioner in Waterford, New York, discovered the properties in ergot which have been of such life-saving importance for obstetrics.

The story of ergot is dramatic in itself. Ergot (*claviceps purpurea*) is a fungus growth found almost exclusively on the grain. The word is derived from the French *argot*, "the

spur of a cock," which the growing fungus somewhat resembles. As early as the close of the 17th century ergotized rye meal was identified as the cause of the pestilence known as St. Anthony's fire. But ergot even before that time had also been recognized as a therapeutic agent. A writer in 1688 mentions its use in parts of Germany to accelerate labor. In 1777 a surgeon of Lyons named Desgranges wrote about the use of spurred-rye in lingering labor.

Medical historians are agreed that the chief credit for the introduction of ergot in obstetrics belongs to the American Dr. John Stearns. Stearns showed early evidence of a brilliant intellect. He graduated from Yale College with distinguished honor in 1789, studied as an apprentice in medicine with Dr. Erastus Sergeant of Stockbridge, and spent two years in medicine at University of Pennsylvania. Shortly after this he began to practise in Waterford, New York, and soon became the leading spirit which in 1805 established the Medical Society of the State of New York. He was its first secretary. In 1809 he was elected a senator in the state legislature. In 1817 he became president of the State Medical Society, and shortly after this he removed to New York City where he became prominent as a consultant. In 1846, when the New York Academy of Medicine was organized it was Dr. John Stearns, then seventy-six years old, who became the first president.

The first of his notable contributions on ergot appeared in 1807. In a letter of January 25 he wrote to Dr. S. Ackerly:

I herewith transmit you a sample of pulvis parturienti, which I have been in the habit of using for several years, with the most complete success . . . It is a vegetable, and appears to be a spurious growth of rye. On examining a granary where rye is stored you will be able to procure a sufficient

quantity from that grain. Rye which grows in low, wet ground, yields it in greatest abundance.

As with so many other innovations in medicine the early use of ergot was marked by controversy. This was largely due to its indiscriminate use in labor. A noteworthy champion of its proper use was Dr. Oliver Prescott of Massachusetts, who in 1813 told the Massachusetts Medical Society:

The uniform operation of the ergot to restrain uterine hemorrhage, has been noticed by other physicians. It has in consequence, frequently been prescribed, a little previous to the birth of the child, or immediately after, to patients who have been accustomed to flow immoderately at such times, and it has always proved an effectual preventive.

The firm establishment of ergot as a great therapeutic agent in obstetrics was due chiefly to Stearns himself, who wrote a masterly essay in 1822 on its use, and his advice at that time is for the most part good sound practice today. His contemporary, Professor William Tully of Yale, wrote of him:

As it was reserved for the illustrious Jenner to investigate and promulgate to the world the important discovery of vaccination, so it has fallen to the lot of our countryman, Dr. Stearns, first to search into and ascertain by experiment, to reduce to scientific form and make public the powers of the Clavus, and at the same time, prescribe the true restrictions, and limitations which should always regulate its use.

Over the years since the introduction of ergot its use has saved untold thousands of women from death from

uncontrollable hemorrhage. In refined or synthetic form it is still universally used. No obstetrician would feel happy if deprived of this reliable drug or one of its derivatives.

Another name which has been compared with the famous Jenner is that of Carl Siegmund Franz Credé, who introduced the use of silver nitrate solution for the prevention and cure of gonorrhoeal infection in the eyes of the newborn, a condition often so severe as to cause blindness in its victim and so contagious that it spreads to other infants through the media of soiled hands, linens and utensils. Credé's other important contribution was his method of early delivery of the placenta which was to replace sneezing powders, emetics, kneading the abdomen, traction on the umbilical cord, and even thrusting the hand into the uterus. Credé did not claim any credit for this and taught that these other methods were dangerous and unnecessary.

By his introduction of silver nitrate solution as a prophylactic measure, he saved literally thousands of babies in his own time and since from blindness and defective vision. Prior to his time records show instances in institutions where one in ten babies was the victim of this tragic infection. Credé clearly demonstrated that the eyes of the newborn became infected from the secretions of the lower genital tract and many became so even in the absence of any visible genital secretion. In speaking of his success he wrote in 1884, "Within a period of almost three years, there occurred in 1160 children, only one or at the most two, cases of blenorrhœa" [infection].

It was at this time that he gave specific directions for carrying out the simple procedure of placing a drop of the solution in each eye of the newborn, stating:

The instillations were made by the head midwife alone, mostly without the supervision of a doctor;

only one student midwife can be useful to the extent that she delicately draws apart a little of the child's eyelids with one finger of her hand. By means of this assistance all the students are trained, and some can carry out the process all by themselves.

An equally important contribution was that of John Charles Weaver Lever, a London physician who discovered albumin in the urine of women suffering from the potentially fatal disease, pregnancy toxemia. His discovery is the basis today of the urine testing which is so important for the early recognition of this disease. In well regulated clinics and in private practice today the severe forms of pregnancy toxemia are seldom seen and when encountered more often than not they are the result of neglect on the part of the woman who is pregnant. In its severe forms pregnancy toxemia is manifested by convulsions. Accounts of the condition are found in earliest medical records.

Lever's great discovery was announced to the medical world in 1843 when he published his *Cases of Puerperal Convulsions with Remarks*. Later he was lecturer in midwifery at the celebrated Guy's Hospital, which he had entered in 1832 as a medical student at the age of twenty-one. As a London obstetrician his practice was highly successful, and he was widely known as a teacher. He died in 1859. His words written in 1843 have deep meaning today:

I further have investigated the condition of the urine in upwards of fifty women from whom the secretion has been drawn during labour . . . and the result has been that in NO cases have I detected albumin, except in those in which there have been convulsions, or in which symptoms have pre-

sented themselves, and which are readily recognized as the precursors of puerperal fits.

When the great Laennec made his epoch-making discovery of auscultation through the use of the stethoscope it was inevitable that this simple instrument would be applied to obstetrical uses. It was a friend and pupil of Laennec, Jean Alexandre Lejumeau, Viscounte de Kergaredec, who discovered the fetal heart sounds while attempting to hear the splashing noises he supposed the fetus would make in the liquor amnii or "waters." Instead of these impossible sounds he heard the fetal heart, which he recognized immediately. His training under Laennec made him appreciate the importance of his discovery, and Laennec himself in the second edition of his great work on auscultation confirmed his pupil's work. Kergaredec had a distinguished scientific and literary career. Shortly before his death in 1877 he was given the French Academy's highest degree.

As early as 1822 he appreciated the importance of his work in determining the position of the fetus in the uterus. He then wrote:

The fetus in the uterus assumes an ovoid form resulting from the anterior curvature of the trunk and the manner in which the extremities are flexed and applied to the anterior part of the body. It must be concluded from this that the back is the point through which the sound of the contractions of the fetal heart are transmitted outward most easily. Hence, when this sound is rather loud there is reason to believe that it is the posterior part of the trunk which is opposite the observer . . . it is not improbable that some time in the future it will be possible to determine the position of the fetus in the uterus with some degree of exactitude.

One of the most important techniques in obstetrical

diagnosis is abdominal palpation, by which the obstetrician can outline the position of the fetus in the uterus. Prior to 1878 the importance of a regular procedure for this purpose was not recognized. It was in this year that a French physician Adolph Pinard published his classical treatise on the subject. Pinard, who was born in 1844, was a medical student at the time of the Franco-Prussian War in 1870. Following the war he became a hospital interne and in 1875 he was teaching in the Maternity Hospital.

In 1890 Pinard succeeded to the chair of clinical obstetrics at the Faculty of Medicine and the next year was elected to the Academy. The importance of his work on abdominal palpation is shown by the fact that today no material advance over his methods has been made. Pinard lived a long and productive life which was terminated in our own time in 1934 at the age of ninety.

Pinard's essay on palpation is a medical classic. The simplicity and directness of his approach is seen in the following:

Therefore, in analyzing with care the sensations perceived, it is only with difficulty that one can mentally see the foetus in utero. That these accoucheurs accustomed to practice palpation, do recognise the various attitudes of the foetus during the latter period of pregnancy, and are able to make an exact diagnosis after the above method, can not be doubted; but at the same time, they well recognize the fact that it requires a long experience to arrive at such a result.

For these reasons I have endeavored to simplify the method, to render it rational, and make it rest entirely on the exact knowledge of the various attitudes the foetus may assume during the last month of gestation; *i.e.* the accommodation.

CHAPTER ELEVEN

THE NINETEENTH CENTURY, THE AMERICAN HERITAGE

In the early part of the 19th century the French midwives Madame Boivin and Madame La Chapelle published their important treatises on obstetrics. The latter's work presented statistical deductions from no less than forty thousand labor cases. In this period too, German obstetricians made many significant contributions to obstetrics, some of which appear elsewhere in this book. Among these men were Gustav A. Michaelis and Carl C. T. Litzmann, who made painstaking observations on pelvic and spinal deformity and their relation to labor. Their great work is authoritative today. Another was Franz Carl Naegele, whose observations in the same field were notable. Among the Britons interested in this subject was the anatomist Sir William Turner of Edinburgh. His classification of pelvis variations is basically that used today by many writers on the subject.

Another important contributor to obstetrics was John Braxton Hicks, an obstetrics teacher and practitioner of London who perfected and popularized the operation of version first introduced by Ambroise Paré. Much of Braxton Hicks' procedure was anticipated, as we shall see, by M. B. Wright of Cincinnati. Another important British obstetrician of the period was Mathews Duncan of Aberdeen, whose

“presence and talk were like the bleak honesty of his native moors.” After receiving his medical degree at Marischal College in 1845, Duncan went to Edinburgh and came under the spell of Simpson. From here he went to Paris and worked at the Hôtel Dieu, returning to practice in Edinburgh in 1848. He was a brilliant lecturer and a first rate scientific observer. In 1877 he was called to St. Bartholomew’s Hospital in London and there he lectured at the Medical School. His contributions to the study of anatomical changes in pregnancy and labor were outstanding, as were his observations on labor mechanisms. He was a worthy heir of the great tradition of British obstetrics which had gone before.

Our inquiry into 19th century obstetrics will concern itself chiefly with events and personalities in our own country. These have deepest interest for us, for they established the foundations of American obstetrics today. Some of the men we have already met: Shippen, Bard, Stearns, Holmes, and Keep. Another was Thomas Chalkley James, a pioneer in obstetric teaching. His father was Abel James, a member of the Society of Friends who, although a non-combatant, gave important service in the Revolution by advancing money to Robert Morris at a time when it was sorely needed. He was a friend of Franklin and a member of the American Philosophical Society.

James studied medicine under Adam Kuhn, professor of the practice of Medicine at the University of Pennsylvania. He graduated as a Bachelor of Medicine in 1787 and the next year sailed as a surgeon on a voyage to the Cape of Good Hope and Canton. In 1791 he went to London as a house-pupil in the Store Street Lying-in Hospital, then under the direction of William Osborne and John Clarke. He also studied in Edinburgh, arriving home in June, 1793, in time

to help combat the plague of yellow fever which was then epidemic at Philadelphia. James first appears as a teacher of obstetrics in 1802; on November 17 of that year he and John Church began a private course of lectures, which was attended by twenty pupils. It was not long before they added practical instruction to the curriculum by establishing a lying-in ward at the Alms House.

In 1801 William Shippen died and Caspar Wistar succeeded him as professor of anatomy and midwifery. Two years later the trustees, under Wistar's urging, created a separate chair for midwifery, though with the stipulation that, "it shall not be necessary in order to obtain the degree of Doctor of Medicine, that the students shall attend the Professor of Midwifery." This elevation of obstetrics to an independent position was obviously not generously given. In 1810 James was elected to the new post, with Nathaniel Chapman as his assistant. His first important written contribution was made the next year when he wrote about artificial induction of labor, which had been advocated in 1801 by Thomas Denman.

James is remembered chiefly as a teacher whose "lectures were handsomely and classically written," says his pupil and successor, Hugh L. Hodge. He was also secretary of the American Philosophical Society, and the Pennsylvania Historical Society was founded almost entirely through his efforts.

Among the unsuccessful candidates for the professorship of midwifery at the time of James' election was William Potts Dewees. He was born at Pottstown, Pennsylvania, May 5, 1768, studied with William Smith of Philadelphia and attended lectures at the University of Pennsylvania, getting his degree of Bachelor of Medicine in 1789. He be-

gan a country practice in Abington, a nearby village, but he moved to Philadelphia in 1793 when the yellow fever epidemic thinned the ranks of physicians there. According to one historian of the time, "Midwifery existed almost universally as an art; the aged and imbecile nurse was preferred to the physician."

In 1806 Dewees took his M. D. degree from the University of Pennsylvania with a thesis entitled, *An Essay on the Means of Lessening Pain and Facilitating Certain Cases of Difficult Parturition*. This immediately gained for him such a reputation that he became a candidate for the chair of midwifery when it was established in 1810. As we have seen, James was chosen instead; but when Dewees was made adjunct professor in 1825, he became the practical occupant of the chair owing to James' ill health. In 1834 Dewees succeeded him in the professorship, but not for long, his own health breaking down and forcing him to retire. A lasting monument is his *System of Midwifery* (1824), which can be recommended to the student today as the work of a master who learned obstetrics at the bedside and practiced it there. The book eventually ran through twelve editions and presented to America not only the thought of the British school but the principles taught by the great French obstetrician, Baudelocque.

Dewees knew the importance of antenatal care and practiced it. He recommended examining patients early in pregnancy to determine the position of the uterus. He was an advocate of pelvimetry and said, "No man should be trusted to practice obstetrics who is ignorant of this important assemblage of bones." His chapter on the conduct of labor is comparable to that appearing in textbooks today. His observations on the use of the forceps were far ahead of his

time. He writes, "When the circumstances of the case require the use of these instruments, the application should not be too long delayed from an imaginary fear that the woman might suffer from their use, or from an illgrounded hope that the woman might deliver herself." Such was the thinking of William P. Dewees, the author of America's first system of obstetrics.

Marmaduke B. Wright has been mentioned before in discussing Braxton Hicks of England. Wright's description of a type of version which he gave to the world in 1854 remains a classic in our obstetric literature. Wright was born in New Jersey in 1803 and studied medicine with Dr. John McKelway, an Edinburgh graduate who practiced in Trenton. He then attended three courses at the University of Pennsylvania and was graduated there when he was twenty. His father, who was considered wealthy, lost his property about this time and moved the family to Columbus, Ohio. He died a year later, leaving a widow and seven children. It was in Columbus that the young Dr. Wright settled in order to keep the family together. By 1833 he was the leading doctor of his district and was a member of the Ohio Legislature. His career there was marked by his efforts to better the treatment of the insane. In 1838 he was appointed to the chair of materia medica and therapeutics at the Ohio Medical College. He then removed to Cincinnati and later succeeded to the professorship of obstetrics and diseases of women, which he occupied for twenty-eight years.

The Wright method of version, which was given to the world six years before that of Braxton Hicks, differs in having direct action on the fetal head and an external hand on the mother's abdomen. Wright is to be remembered not alone for this contribution but also for his pioneer work in

medical education in the then New West and his influence on his brother physicians. A contemporary wrote of him, "The one of nature's books he knew thoroughly was practical obstetrics."

One of the truly great American textbooks in obstetrics is *Principles and Practice of Obstetrics* by Hugh Lenox Hodge of Philadelphia. This is the work of which Whitridge Williams said, "It is undoubtedly the most original work which has appeared in America, and with few modifications is as valuable today as when first written." Hodge was one of two men in whom obstetrical teaching in our country was largely centered in the middle of the last century. The other was Charles D. Meigs. Both were of Philadelphia, where Hodge was born June 27, 1796. His father, Dr. Hugh Hodge, was an army surgeon in the Revolution and later practiced in Philadelphia. Hugh Lenox studied medicine under the celebrated Caspar Wistar and was graduated a doctor of medicine at the University of Pennsylvania in 1818. He then went as a ship's surgeon to Calcutta, returning after some months to America. In connection with practice in Philadelphia he early began to teach and in the summer of 1821 he was selected to teach the anatomy class of William E. Horner, who was absent in Europe. Later he lectured in surgery at the Chapman's summer school and this led him into medical teaching as a career. Because of a gradual failure in vision he decided to abandon surgery and turn his attention to obstetrics.

When Dewees was compelled to withdraw from the professorship of obstetrics because of ill health, both Hodge and Meigs became the leading candidates. Hodge refused to exert himself for the position, much to the annoyance of his friends who were working for him in the campaign, for

such it was. He was elected, however, and served until 1863, when his failing eyesight caused him to resign and become emeritus. Even then a biographer says of him, "he did all the professional work which could be done without eyes. The poor and the students could still count on finding him in a serene mind, tender and sympathetic with a loyal unswerving trust in God." It was at this time that his great work on the principles and practice was written.

Hodge was an outstanding authority in his day on deformities of the pelvis and although he opposed Holmes' views regarding the contagiousness of childbed fever he was not so vehement as his colleague Meigs and raised no animosity in the heart of the young professor of anatomy at Harvard. Writers have assumed that Hodge opposed anesthesia in childbirth also, but this is not entirely true. He did object to its indiscriminate use, as many obstetricians do today, but agreed that in some instances complete anesthesia was essential. He was a great believer in the sound use of the forceps as we understand it now and his own modification of the instrument had many advantages over most models of his day.

As an obstetrician of worth and wisdom Hodge is seen in these words from his great work: "It is the business, therefore, of the practitioner carefully to watch the whole process of labor, to ascertain whether it is perfectly regular, and to detect any, even the least deviation from the natural process, that timely assistance may be rendered."

Hugh Lenox Hodge is also to be remembered today for the fortitude he displayed in carrying on his life work under the affliction of blindness. His greatness lies in his devotion to medicine as well as the mastery he brought to it.

Charles D. Meigs, whose name is so often linked with

Hodge because of their opposition to Holmes, was unlike Hodge in almost every respect. He is equally interesting to us, although he still remains controversial. Certain it is that he was often on the wrong side of leading questions; yet Charles D. Meigs was a truly great teacher who elevated the standards of instruction and the practice of obstetrics. His father, Josiah Meigs of Middletown, Connecticut, was the sixth generation from Vincent Meigs, who came to Connecticut, in 1647. Josiah Meigs was educated at Yale and moved to Bermuda after his marriage in 1790. Charles was born here in 1792. Four years later the family returned to New Haven, where the father was made professor of mathematics and natural philosophy in Yale College. Then when Charles was eight years old, the father became president of the University of Georgia. The family moved again and in 1809 the young man graduated from that university. In 1817 he took his medical degree at the University of Pennsylvania. One of the first acts that called attention to Meigs as an obstetrician was his translation in 1831 of Velpeau's *Elementary Treatise on Midwifery*. Seven years later he published his *Philadelphia Practice of Midwifery*.

In 1841 at the time of the reorganization of the Jefferson Medical College, Meigs was elected professor of obstetrics and diseases of women and children, and at this time he came into his own as one of the most popular and influential teachers of his generation. His dramatic style of lecturing made him popular as a public speaker. He was a man of many parts, being accomplished in painting and modeling. He illustrated some of his own books. His extraordinary activity eventually wore him down and in 1860 he retired to spend his remaining nine years on his farm

in Delaware County. Meigs' active and forceful nature made him a violent opponent of any medical procedure of his day which he did not believe in. He opposed the theory of the contagiousness of puerperal fever on the ground that he could not conceive of the mode of transmission. He opposed anesthetics on the ground that they interfered with normal physiology and that they were dangerous. At that time chloroform was being used extensively and not always by experienced hands. Meigs was an indomitable fighter for what he considered the truth even if from our standpoint he sometimes went astray. However, he was a great leader in medicine and those who came under his influence were better men for that contact.

In the year 1850 there was tried in Buffalo, New York, a suit for libel which had an important effect on the teaching of obstetrics in America. Horatio N. Loomis, a physician, was accused of writing and circulating a scurrilous editorial aimed against James P. White, professor of midwifery in the newly formed University of Buffalo. On January 18, 1850, White had performed a delivery on a woman named Mary Watson before some of his senior medical students. It was her second child. She was not married. For some time before her delivery she had lived with the janitor and his wife at the medical school, and after the event Dr. White had presented her with \$10.00, which she stated had been no inducement for her to go there. Testimony at the trial showed that at no time was she unduly exposed and that the whole procedure was very much like that of a clinical demonstration today.

The mass of historical material which is available regarding this demonstration is witness to the wide controversy which it started. White, the "Champion of

Demonstrative Midwifery," was completely vindicated. Among the objectors to White's action were seventeen fellow physicians, who inspired the *Louisville Medical Journal* (June, 1850) to comment;

The prudish Miss Nancies of Buffalo have unintentionally conferred a benefit on the medical profession We can easily imagine a childlike simplicity that would put pantelets upon the legs of a piano and that would screen with a veil everything capable of exciting prurient ideas but we do not like to see this excessive flirtation with modesty, introduced into medical teaching.

James Platt White was something more than a pioneer in clinical teaching. He was one of the leaders in obstetrics and gynecology of his time. He was an accomplished surgeon, wrote extensively for the medical journals of his day, and had over a hundred ovariectomies to his credit. He was born in Austerlitz, Columbia County, New York, in 1811, and received his medical degree from Jefferson Medical College in 1834. The establishment of the University of Buffalo was due largely to his exertions. In 1870 he was invited to give a course of lectures on obstetrics at Bellevue Hospital Medical College. In 1878 he was elected first vice president of the American Medical Association. By his teaching and clinical work White was an important force in the advancement of scientific medicine in his time, and to him belongs the credit for first bringing to attention a successful treatment for chronic uterine inversion. His name is also associated with a modification of the obstetrical forceps.

During the first half of the 19th century there occurred in our Middle West what is known as the Opening Up. Many medical leaders in that section began practice as pio-

neers in frontier country. One such was the indomitable Daniel Drake, who did so much to establish scientific medicine and promulgate medical schools there. In the development of obstetrics the name of Henry Miller stands alone. He came by the pioneering spirit honestly, for his father was one of the first settlers in Barren County, Kentucky. Here he was born in the town of Glasgow in 1800. At the age of seventeen he began to study medicine under the local doctors, Bainbridge and Gist. As their apprentice he was "chief pharmacist, dentist and bleeder for his county." In 1819 he attended his first full course of lectures at the Medical Department of Transylvania University, which had been organized in Lexington in 1799. At the end of this time he returned home and was taken into partnership by Bainbridge, Gist having removed to another county.

After a second course of lectures Henry Miller received the degree of Doctor of Medicine in 1821. In 1827 he moved to Harrodsburg, then a popular watering place, and built up an extensive practice. In 1835 he was called to Louisville to aid in organizing a medical school. For twenty-three years he served as professor of obstetrics and diseases of women and children in the Medical Department of Louisville University.

In 1858 he resigned in order to devote more attention to his practice, and nine years later a special chair of medical and surgical diseases of women was created for him. To Henry Miller belongs the credit for introducing into the obstetric literature of this country Dugés' simplified classification of fetal presentation and position, one which is largely universal today.

Miller's first textbook appeared in 1849, *A Theoretical and Practical Treatise on Human Parturition*, and his

second in 1858, *The Principles and Practice of Obstetrics*. In the latter he records his opinion of anesthesia in childbirth:

It was not until the twentieth of February, 1848 that anaesthetics were used in midwifery in Louisville, or so far as I know on this side of the Allegheny Mountains. The occasion occurred in my own practice . . . etherization in childbirth is one of the greatest benefactions of science . . . I should be recreant alike to truth and duty if I did not attempt to vindicate it against the objections which have been alleged by those high authorities in obstetric medicine. (Ramsbotham and Meigs.)

In 1859 Henry Miller's stature as a physician was further recognized by his election as president of the American Medical Association. That he was aware of the important work he was doing in the Middle West is seen in his words: "Long ago it was said or sung, 'Westward the star of empire takes its way,' may it not have reached the banks of the Ohio by this time?"

A pioneer of a different sort was Theophilus Parvin, who was the first on our shores to establish hospital instruction in obstetrics for medical students. His *Science and Art of Obstetrics*, published in 1886, was said to teem with characteristics of the man. In appraising it, it is not difficult to believe that his acquaintance with obstetric literature was unsurpassed by that of any of his contemporaries. His familiarity with the writing of the ancients as well as the Bible and the Talmud are greatly in evidence. Although a profound literary stylist, Parvin shows much original thought which manifests itself in sound and at times prophetic doctrine.

Parvin's care of the antenatal patient sounds a familiar modern note, for he recommends that: "The obstetrician should visit the pregnant woman from time to time especially during the latter weeks of pregnancy, so that he may know that her condition is favorable for her approaching trial. Once a week during her last two or three months of gestation the urine should be examined with reference to possible albuminuria." He also quotes a European authority who says of nitrous oxide oxygen that "it can be inhaled for hours without any bad results."

Among his writings we should not overlook his *Lectures on Obstetric Nursing*, a small work of less than a hundred pages and a medical classic. He emphasizes the value of the nurse in making antenatal visits and recognizing untoward signs and symptoms, so that they may be reported. Much of his thought in this little volume is not outmoded by present day opinion.

In 1888 Parvin made an address to The Academy of Medicine in New York in which he pointed out that the vast majority of American medical students are graduated without ever having witnessed, still less had charge of, a case of labor. He recommended that every medical school hospital should include a maternity department, in which practical obstetrics could be taught. It had been through his efforts that previous to this the trustees of the Jefferson Medical College had authorized the first maternity department in any American hospital and set aside three rooms for the purpose.

At a later date as president of the American Gynecological Society he sounded this prophetic note: "The true ideal can only be realized in a large hospital devoted to obstetrics and diseases of women, students being taught

in a small number at a time.”

Theophilus Parvin was born in 1829 at Buenos Aires, where his father was a missionary. His mother was the daughter of our Minister there. He was left an orphan at the age of seven and went to live with a guardian, the Rev. Dr. Steele of Abington, Pennsylvania. He graduated from the University of Indiana in 1847 and then studied Hebrew and Greek at the Princeton Theological Seminary for three years while teaching in the Lawrenceville High School nearby.

Parvin received his medical degree from the University of Pennsylvania in 1852 and practiced in Indianapolis through most of the war. In 1864 he joined the medical faculty of Ohio Medical College as professor of materia medica and five years later he succeeded to the professorship of obstetrics and diseases of women at the University of Louisville. He subsequently filled similar positions at the College of Physicians and Surgeons at Indianapolis and at the Medical College of Indiana respectively. In 1883 he was called to the chair of obstetrics and diseases of women and children at Jefferson Medical College, Philadelphia. There like his distinguished contemporaries Hodge and Meigs, he brought his life as a physician and teacher to great fulfillment. He died in 1898.

From the time of William Shippen's "convenient Lodging for the Accommodation of a few poor Women" in 1765, the development of maternity hospitals first in Europe and then in America forms an interesting story. In New York, the Almshouse established the earliest lying-in ward in 1799 and Valentine Seaman gave lectures to women there on midwifery. The New York Lying-in Hospital was also founded in that year by David Hosack. As we have seen,

Thomas C. James began to conduct classes in midwifery at the Philadelphia General Hospital in 1810. In 1822 a maternity hospital was established in Baltimore by the College of Physicians and Surgeons. The first Sloane Maternity Hospital was opened in New York under the direction of Edwin B. Cragin in 1887, and two years later the Pennsylvania Maternity Hospital was founded at Philadelphia through the efforts of Barton C. Hirst.

Many of the hospitals which have become great in our time had very humble beginnings, a good example being the Boston Lying-in Hospital. It started in a dwelling house in 1832, closed after twenty-four years of operation, and reopened in 1871. Most of the initial effort which founded the hospital came from Walter Channing, whom we have met before. When he resigned as physician in charge, in 1838, his place was taken by David Humphreys Storer, who also succeeded him as professor of midwifery at Harvard. Among Storer's teaching practices was the arrangement to pay practicing physicians of the Boston Dispensary \$2.00 for every maternity case turned over to the students. Great credit must be given to the trustees of the Lying-in Hospital for protecting its funds during the period of its closure. In 1871 it was reopened in another house bought to contain it not far from the Massachusetts General Hospital, and the first patient was delivered there early in 1872.

At that time one of the attending physicians was William Lambert Richardson, then thirty years old. In 1886 he too became professor of obstetrics at Harvard. Shortly after this he was elected physician-in-chief of the Lying-in Hospital, a position which he held until 1907. In our day he has been referred to as the patron saint of the hospital and with good reason, for he gave to it the utmost of his time,

his talent, and his substance. For the purchase of the land on which the present hospital stands he gave half of the \$90,000 needed, and at his death in 1930 the bulk of his fortune was left so that it came eventually to the Hospital and the Harvard Medical School.

Richardson is important in our history because of his contributions to obstetric teaching. In 1880 he established the outpatient department for the home care of women in childbirth. Three years later he began teaching students in the hospital wards, thus establishing the first teaching obstetrical clinic in New England. He also founded a nurses' training school.

In the last quarter of the 19th century those who were to carry the torch into the 20th century were training for their roles. American obstetrics was greatly fortunate in the new champions of the cause because these men were deeply imbued with the spirit of their masters. They were to face a new and vastly widened arena, for by then most of the country's frontiers had vanished. Medical schools and hospitals even if small were to be found in far sections of the land. A list of these early 20th century leaders illustrates the wide area of their activities. Such a list would include Fred L. Adair of Chicago, Arthur H. Bill of Cleveland, Walter W. Chipman of Montreal, Edwin P. Davis of Philadelphia, Joseph B. DeLee of Chicago, J. Clifton Edgar of New York, George Gray Ward of New York, Palmer Findley of Omaha, Frank W. Lynch of San Francisco, John Osborn Polak of Brooklyn, Reuben Peterson of Ann Arbor, Henry Schwartz of St. Louis, Robert L. Dickinson of Brooklyn, C. Jeff Miller of New Orleans, William E. Studdiford of New York, John Clarence Webster of Chicago, Charles M. Green of Boston, J. Whitridge Williams of Baltimore, Barton C. Hirst of Philadelphia.

Other names belong in this list and it is interesting to note that nearly all of these men wrote textbooks on obstetrics.

These obstetrical leaders were as much pioneers as their predecessors, for at the turn of the century the teaching of practical obstetrics in all medical schools was chiefly done in the homes of patients. Many doctors practicing today went through medical school training without ever seeing a hospital delivery. Although things had changed considerably since the time of T. C. James, when a course in obstetrics was not required for the medical degree, obstetrics in the curriculum was still something of a step-sister, and the leading obstetrical journal in this country had begun life in 1869 as *The American Journal of Obstetrics and Diseases of Women and Children*. At the turn of the century pediatrics as a special branch of medicine was just being born and gynecology was still in its adolescence.

At the beginning of the 19th century the teaching of obstetrics had been a part of the apprentice system of medicine, although Bard in New York and Shippen in Philadelphia had begun more formal instruction. Man-midwifery at this time had become well established in the centers of population and in this connection the great influence of James Lloyd, an obstetrician of Boston, should be mentioned.

As we have seen, the tradition of Shippen as a teacher was well carried on by James, Dewees, Hodge and Meigs, so that by the middle of the 19th century Philadelphia had become the mecca for obstetrical students. It is not too difficult to understand something of the attitude of Hodge and Meigs in discarding the ideas of Holmes, who was at that time a young professor of anatomy and could have had but slight clinical experience with childbed fever. However, when Channing, a professor of obstetrics, backed by the great Simpson,

came along to support the use of anesthesia in childbirth, the rejection of Meigs is not so easy to comprehend.

In spite of what we have said about the important contributions of American doctors to obstetrics in the 19th century we must not underestimate the influence of European obstetrics during this period. The writings of Smellie, Hunter, Denman, and Baudelocque appeared in American editions which were widely read. All through the century and indeed up to the first World War there were but few leaders of American obstetrics who had not spent a considerable period of study in the clinics of Great Britain, Germany, France, or Austria under recognized masters of the science. The facilities of the lying-in hospitals of Dublin, Edinburgh, London, Paris, Berlin, and Vienna at that time were large even by the standards of today. In America well into the 20th century any such type of teaching institution was rare and when it did exist was small by comparison. It was an important part of the task of those named here to develop hospital teaching centers for this country, and as we know they did the job magnificently.

To me the most influential and distinguished of this group of American obstetricians was John Whitridge Williams of Baltimore. He deserves more than mention if for no other reason that that he was the first important historian of American obstetrics. Whitridge Williams was one of the group who inaugurated medical teaching at Johns Hopkins Hospital in the latter part of the 19th century, first as an associate of Howard A. Kelly and later as the first occupant of the chair of obstetrics, which he held till his death in 1931.

His colleague, Howard A. Kelly, wrote of him: "Since the days of Hugh Hodge whose work was limited rather to the mechanism of parturition, no obstetrical leader in Ameri-



JOHN WHITRIDGE WILLIAMS, 1886-1931

ca has touched Williams in the sustained high character of work in this field." He was great as an investigator and certainly as a teacher. "By his own estimation," says Slemons, "his cardinal product was the men he trained." It was the proud boast of his admirers that at one time more "Williams' men" occupied professorships in this country and Canada than did those of any other medical teacher in any field.

As a pupil and friend, I find my own sentiments of Whitridge Williams echoed in those of another who wrote:

In the lecture room, and everywhere else for that matter, he gave the impression of a thoroughbred. The practice of medicine was a natural heritage, since both sides of his ancestry included physicians, and for a hundred and sixty years had not failed in a single generation to include at least one member of the medical profession. With a father reared in Virginia and a mother, born Whitridge, whose antecedents reached back from Rhode Island to England, there were blended in his character the personal charm of the South and the hardy vigor of the North. He could well have been the model of Hazlitt's essay *On The Look Of A Gentleman*. Ease, grace and dignity were the symbols of his habitual self-control. He seemed to be as he liked without restraint, confusion or awkwardness.

It was the Sage of Concord who observed that a man is great who is what he is from Nature, and never reminds us of others.

CHAPTER TWELVE

HISTORY IN THE MAKING

The first half of the present century will be remembered by medical historians as a time when doctors, nurses, sociologists and others were beginning to realize the great opportunities inherent in obstetrical science for furthering human welfare.

Since the half century mark the safety of the childbirth process has reached levels hardly believable even two decades ago. Not only is childbirth safe today, but efforts are being made to make it more satisfying and rewarding as an important human experience. More and more expectant parents themselves are beginning to recognize that family life really begins with conception and from this time on attention to the mother's health and planning for parenthood are important concerns for them.

No one can doubt that the present low rates of maternal and fetal mortality are chiefly due to systematic care of the pregnant mother in the Prenatal or Antenatal Program, now an essential part of good obstetrics everywhere. It does seem remarkable that following the pioneer work of Charles White in the 18th century and John Lever in the 19th, antenatal supervision as a regular procedure should be so late in its general adoption, particularly in our own country where so great a proportion of maternity care was in the hands of phy-

sicians. Actually, there was no concerted action in the matter here until after the turn of the present century. According to J. M. Slemons, it was Mrs. William Lowell Putnam who introduced the idea when she influenced the Instructive District Nursing Association of Boston to pay antenatal visits to some of the mothers who were to be delivered at the Boston Lying-in Hospital. In New York the Association for Improving the Condition of the Poor assigned three nurses in 1908 to visit expectant women among the Society's relief families and to educate them in hygiene and otherwise prepare them for childbirth.

But the spread of the doctrine was slow and it is recorded that Mrs. Putnam, discouraged at the general lack of enthusiasm, went to Baltimore to see J. Whitridge Williams, the Johns Hopkins professor of obstetrics. Apparently she convinced him of the worth of the work the Boston nurses were doing. It is certain that after a period of trial he became the most influential advocate of systematic antenatal care, and his paper *The Limitations and Possibilities of Prenatal Care*, given in 1915 before the American Association for the Study and Prevention of Infant Mortality, is a landmark in the progress of preventive medicine.

The lowering of American maternal mortality in the last twenty-five years is perhaps the most dramatic example we possess of what preventive medicine can do. In 1935 in 10,000 cases of live births 58 mothers died. Today the figure is 6. In 1935 the mortality from infection was 24 per 10,000 live births; today it is 1.3. In the same period the rate in pregnancy toxemias as a cause of death fell from 12.7 to 2.3 and in hemorrhage and shock from 18.2 to 2. All of this fine record is the result of foresight and hard work on the

part of countless doctors, nurses, social workers, public health agencies, and others.

It is the purpose of this chapter not to deal historically with events since 1900, but merely to indicate future trends in the development of obstetrical science. Within our own time such important medical advances as the discovery of the antibiotics, improvements in surgical and anesthesia techniques, and the development of new diagnostic methods have had direct bearing on obstetric procedure. Among the discoveries peculiarly related to obstetrics should be mentioned our realization of the effects of German Measles and other contagious diseases upon the offspring, the discovery of the Rh blood factor, and the general application of the Wassermann blood test for syphilis. The laboratory procedures include tests for the presence of pregnancy. Electronics and x-ray techniques have greatly added to our knowledge of the physiology and mechanics of childbirth.

An important factor in reducing maternal and fetal mortality is the present high percentage of hospitalization for maternity cases, nearly 100 per cent in some states, and over 85 percent for the nation as a whole. There is no doubt that obstetrical practice and hospital construction in the future will be influenced more and more by such advances as rooming-in for mother and baby, the use of individual labor rooms for all mothers, and the housing of maternal cases in units completely shielded from hospital zones dedicated to the care of the sick.

Everyone concerned is becoming aware that the implications of maternity care go beyond safeguarding mothers from the hazards of childbirth and extend into the actual core of our evolving civilization. No one can seriously question the main benefits that the change from home to hospital

care has brought to childbearing women. Certain authorities do question the usefulness of some aspects of conventional hospital care. I refer to such practices as separation of the mother and infant in the central nursery system, the use of the general labor room in which the woman in labor is exposed to others in various stages of the process, the inability of the husband to stay with his wife during the long early part of the labor period, and the heavy use of sedative drugs in normal labor to obliterate the mother's memory of the experience. One eminent psychiatrist tells us that the guiding principle should be, "to find a technic of delivery in which the psychic value of the mother's participation in the process is taken into account, and to reunite mother and child as soon as possible after birth." Dr. Eastman of Johns Hopkins has this to say:

In view of the huge number of patients which most obstetricians, both in clinics and private practice, are called upon to attend these days, and in view of the necessary systematizing of hospital obstetric practices, both medical and nursing, these important psychological aspects of childbearing are often neglected in favor of what we might call "assembly line methods". Here the mother becomes a "case", a hospital number rather than a person. It is one of the great contributions of natural childbirth that its basic concepts have done much to counteract this threat of mechanization in maternity care.

He continues:

Natural Childbirth is a broad concept and represents an attempt on the part of those who care for pregnant and parturient women to understand the physiology of pregnancy and labor, especially

in its emotional aspects, so that these important functions may be viewed with less apprehension and better understanding by patients and that greater skill in caring for them may be developed.

The Natural Childbirth Program as it relates to maternity care was first introduced in this country in clinic practice at the Yale School of Medicine in 1946. The term "Natural Childbirth" is unfortunately vague. "Preparation for Childbirth" is to be preferred and is used in many clinics today. Some of the desirable features of such a plan are admittedly difficult to superimpose on a regulated hospital regime which seems to be functioning efficiently. But again I quote Dr. Eastman because his views closely correspond to my own:

The meticulous care in labor which natural childbirth envisages for every parturient is an ideal which we should all like to adopt. Indeed, if just one tenet of natural childbirth could be implemented everywhere in this country the welfare of our parturients would be revolutionized. I refer to the tenet that no woman in labor should ever be left alone. Even though the attendant be blind, deaf and dumb, a hand to hold means everything.

All this means that a direct responsibility falls upon doctors, nurses and hospital authorities to see hands (and hearts) are made available for just such labor attendance.

The broad aspects of these new programs involve preparation not only for the birth process but for the start of family life. Today more than ever the responsibilities of parents are receiving wide attention. Child-parent relationships even in earliest contacts are said to have potentialities for good or evil little suspected formerly. A healthy and intelligent start for family life is important and desirable.

Today in our national life the chief problems for most people are not those related to economic well-being but those of uncertainty, anxiety, and fear. Salvation must come through the application of established psychological principles and better understanding of human relationships. A wisely administered Preparation for Childbirth Program should include preparation for the start of family life in order to pay highest dividends.

The challenge of the future in obstetrical science is based upon the triumphs of the past and the glories of the present and if the American public should become as excited about the problems of human reproduction as it now is about the attack on certain major diseases, benefits would accrue of the profoundest significance. Given a real public support for research in human reproduction, it is safe to predict that many problems now concerned with pregnancy and labor would be eliminated. The words of Dr. John Rock have significant meaning: "Yet consider our efforts to learn the nature and life history of the malignant cell, while we neglect the nature and life history of the fertilized egg and how it must be cared for by the mother that both she and her charge will prosper to substantiate the happy family."

The real start of family life begins with conception, and the more we know about it and its subsequent course the more waste of human life will be eliminated. So, too, the more we can learn about the successful start of family life and its subsequent course, the better we can teach its fundamental principles. Bearing these things in mind, we see that the challenge for the future in the science and art of obstetrics comes not only to the obstetrician and his co-workers but to all who have a concern in healthy parenthood.

BIBLIOGRAPHY

The historical and biographical material in this work has been drawn largely from the following sources. The list is given here in sincere acknowledgement for its great usefulness in the preparation of this book and also to aid the reader who wishes to become further acquainted with these subjects.

GENERAL WORKS ON THE HISTORY OF OBSTETRICS

- Aveling, J. H., *English Midwives, their History and Prospects*. London, 1872.
- Findley, Palmer, *Priests of Lucina*. Boston, 1939.
- Findley, Palmer, *The Story of Childbirth*. New York, 1934.
- Garrison, F. H., *Introduction to the History of Medicine*. 3d. ed. Philadelphia, 1921.
- Haydon, M. O., "English Midwives in Three Centuries." *Maternity*, 1919, 3: 407-9.
- Jameson, E. M., *Gynecology and Obstetrics*. New York, 1936.
- Kerr, J. M. M., Johnstone, R. W. & Phillips, M. H., *Historical Review of British Obstetrics and Gynaecology*. Edinburgh and London, 1954.
- Packard, F. R., *History of Medicine in the United States*. Philadelphia, 1901.
- Riesman, D., *The Story of Medicine in the Middle Ages*. New York, 1935.
- Spencer, H. R., *The History of British Midwifery from 1650 to 1800*. London, 1927.
- Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.
- Thoms, H., *Classical Contributions to Obstetrics and Gynecology*. Springfield, Ill., 1935.

BIOGRAPHICAL AND SUBJECT REFERENCES

ANESTHESIA

- Gordon, H. L., *Sir James Young Simpson and Chloroform (1811-1870)*. New York, 1897

Thoms, H., "Anesthésie à la Reine." *Amer. J. Obstet. Gynec.*, 1940, 40:340-6.

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

BARD, SAMUEL

McVickar, J., *Domestic Narrative of the Life of Samuel Bard, M.D., LL.D.* New York, 1822.

—Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

BAUDELLOCQUE, JEAN LOUIS

—Thoms, H., *Classical Contributions to Obstetrics and Gynecology*. Springfield, Ill., 1935.

BURTON, JOHN

Johnstone, R. W., *William Smellie*. Edinburgh and London, 1952.

Spencer, H. R., *The History of British Midwifery from 1650 to 1800*. London, 1927.

CESAREAN SECTION

— Findley, Palmer, *Priests of Lucina*. Boston, 1939.

Thoms, H., *Classical Contributions to Obstetrics and Gynecology*. Springfield, Ill., 1935.

Thoms, H. and Godfried, M. S., "A Ten Year Survey of Cesarean Section at New Haven Hospital." *Amer. J. Obstet. Gynec.*, 1946, 51: 880-4.

Williams, J. W., *Obstetrics*. 6th ed. New York, 1930.

— Young, J. H., *Caesarian Section: the History and Development of the Operation from Earliest Times*. London, 1944.

— CHANNING, WALTER

— Channing, W., *A Treatise on Etherization in Childbirth*. Boston, 1848.

Kelly, H. A. and Burrage, W. L., *American Medical Biographies*. Baltimore, 1920.

"The Late Dr. Channing." *Boston Med. Surg. J.*, 1876, 95: 237-8.

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

DEWEES, WILLIAM POTTS

Carson, J., *History of the Medical Department of the University of Pennsylvania*. Philadelphia, 1869.

Gross, S. D., *Lives of Eminent Physicians and Surgeons of the 19th Century*. Philadelphia, 1861.

Henry, F. P., *Standard History of the Medical Profession of Philadelphia*. Chicago, 1897.

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

Williams, S. W., *American Medical Biography*. Greenfield, 1845.

CHILDBIRTH FEVER

Adami, J. G., *Charles White of Manchester (1728-1813)*. Liverpool, 1922.

Cullingworth, C. J., "An Address on Charles White, F. R. S." *Lancet*, 1903, 2: 1071-6.

Dubos, R. J., *Louis Pasteur, Freelance of Science*. Boston, 1950.

Morse, J. T., Jr., *Life and Letters of O. W. Holmes*. Boston, 1896.

Sinclair, W. J., *Semmelweis, His Life and Doctrine*. Manchester, 1909.

Slaughter, F. G., *Immortal Magyar*. New York, 1950.

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

Thoms, H., "Gordon of Aberdeen." *Amer. J. Obstet. Gynec.*, 1928, 15: 229-33.

Vallery-Radot, R., *Life of Louis Pasteur*. London, 1911.

CREDE, CARL SIEGMUND FRANZ

Rosenberg, J., "In Memoriam." *Amer. J. Obstet. Dis. Wom.*, 1892, 25: 780-2.

Thoms, H., *Classical Contributions to Obstetrics and Gynecology*. Springfield, Ill., 1935.

DENMAN, THOMAS

Spencer, H. R., *The History of British Midwifery from 1650 to 1800*. London, 1927.

VAN DEVENTER, HENRIK

Findley, Palmer, *Priests of Lucina*. Boston, 1939.

Thoms, H., *Classical Contribution to Obstetrics and Gynecology*. Springfield, Ill., 1935.

FORCEPS

-- Aveling, J. H., *The Chamberlens and the Midwifery Forceps*. London, 1882.

-- Das, K., *Obstetric Forceps, its History and Evolution*. St. Louis, 1929.

-- Johnstone, R. W., *William Smellie*. Edinburgh and London, 1952.

-- Partridge, H. G., "History of the Obstetric Forceps." *Amer. J. Obstet. Dis. Wom.*, 1905, 51: 765-73.

- Radcliffe, W., *The Secret Instrument*. London, 1947.
Spencer, H. R., *The History of British Midwifery from 1650 to 1800*.
London, 1927.
Thoms, H., *Classical Contributions to Obstetrics and Gynecology*.
Springfield, Ill., 1935.

HARVEY, WILLIAM

- Findley, Palmer, *Priests of Lucina*. Boston, 1939.
Power, D., *William Harvey*. (Master of Medicine Series) London,
1897.
Thoms, H., *Classical Contributions to Obstetrics and Gynecology*.
Springfield, Ill., 1935.

HUNTER, WILLIAM

- Fox, R. H., *William Hunter*. London, 1901.
Spencer, H. R., *The History of British Midwifery from 1650 to 1800*.
London, 1927.

HOLMES, OLIVER WENDELL

- Harvey, T. W., "O. W. Holmes, his Work, etc." *Med. Rec., N. Y.*,
1911, 79:102-5.
Holmes, O. W., *Puerperal Fever as a Private Pestilence*. Boston, 1855.
Morse, J. T., Jr., *Life and Letters of O. W. Holmes*. Boston, 1896.
Osler, W., "O. W. Holmes." *Johns Hopk. Hosp. Bull.*, 1894, 6: 85-88.
Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

HUTCHINSON, ANNE

- Rugg, W. K., *Unafraid — a Life of Anne Hutchinson*. Boston and
New York, 1930.
Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

JAMES, THOMAS CHALKLEY

- Carson, J., *History of the Medical Department of the University of
Pennsylvania*. Philadelphia, 1869.
Hodge, H. L., "Biography of T. C. James." *Amer. J. Med. Sci.*, 1843,
6: 91-106.
Morris, Caspar, *Lives of Eminent American Physicians and Surgeons*.
Philadelphia, 1861.
Thoms, H., "Thomas Chalkley James, a Pioneer in the Teaching of
Obstetrics in America." *Amer. J. Obstet. Gynec.*, 1935, 29: 289-
94.
Williams, S. W., *American Medical Biography*. Greenfield, 1845.

HODGE, HUGH LENOX

Goodell, William, *Biographical Memoir of H. L. Hodge, M.D., LL.D.* Philadelphia, 1874.

Hodge, H. L., *Family History and Reminiscences.* Philadelphia, 1903.

Thoms, H., "Hugh Lenox Hodge, a Master Mind in Obstetrical Science." *Amer. J. Obstet. Gynec.*, 1937, 33: 886-92.

KEEP, NATHAN COOLEY

Hapgood, R. L., *History of Harvard Dental School.* Boston, 1930.

Thoms, H., "Anesthésie à la Reine." *Amer. J. Obstet. Gynec.*, 1940, 40: 340-6.

MEIGS, CHARLES DELUCENA

Kelly, H. A., and Burrage, W. L., *American Medical Biographies.* Baltimore, 1920.

Thoms, H., "Charles Delucena Meigs." *Amer. J. Obstet. Gynec.*, 1936 31: 1049-55.

MILLER, HENRY

Gross, S. D., et. al., "Memoir of Henry Miller." *Trans. Amer. Med. Assoc.*, 1875, 26: 441-4.

Peter, R., *History of the Medical Department of Transylvania University.* Louisville, 1905.

—Thoms, H., "Henry Miller and the Development of Scientific Obstetrics in the New West." *Amer. J. Obstet. Gynec.*, 1938, 35: 716-20.

MIDWIVES

Aveling, J. H., *English Midwives, their History and Prospects.* London, 1872.

Blanton, W. B., *Medicine in Virginia in the Seventeenth Century.* Richmond, 1930.

Breckinridge, Mary, *Wide Neighborhoods.* New York, 1952.

Haydon, M. O., "English Midwives in Three Centuries." *Maternity*, 1919, 3: 407-9.

—Maternity Center Association, New York, *Twenty Years of Nurse-Midwifery, 1933-53.* New York, 1955.

Packard, F. R., *History of Medicine in the United States.* Philadelphia, 1901.

Thoms, H., *Chapters in American Obstetrics.* Springfield, Ill., 1933.

Thoms, H., *Classical Contributions to Obstetrics and Gynecology.* Springfield, Ill., 1935.

- Thoms, H., "A Wider Outlook in Obstetrics." *Amer. J. Obstet. Gynec.*, 1956, 72: 1305.
- Viets, H. R., *A Brief History of Medicine in Massachusetts*. Boston, 1930.
- Walsh, J. J., *History of Medicine in New York*. New York, 1919.

PARÉ, AMBROISE

- Findley, Palmer, *Priests of Lucina*. Boston, 1939.
- Packard, F. R., *Life and Times of Ambroise Paré*. New York, 1921.
- Paget, S., *Ambroise Paré and his Times, 1510-1590*. London, 1897.
- Thoms, H., *Classical Contributions to Obstetrics and Gynecology*. Springfield, Ill., 1935.

PARVIN, THEOPHILUS

- Obituary. *Med. Rec., N.Y.*, 1898, 53: 201.
- Parish, W. H., [Theophilus Parvin.] *Trans. Amer. Gynec. Soc.*, 1899, 24: 510-4.
- Thoms, H., "Theophilus Parvin." *Amer. J. Obstet. Gynec.*, 1941, 42: 346-51.

PREPARATION FOR CHILDBIRTH

- Thoms, H., *Training for Childbirth*. New York, 1950.
- Thoms, H. and Billings, W. C., "A Consideration of Childbirth Programs." *New Engl. J. Med.*, 1956, 255: 860-2
- Thoms, H., Roth, L. G. and Linton, D., *Understanding Natural Childbirth*. New York, 1950.

PRIMITIVE CHILDBIRTH

- Englemann, G. J., *Labor Among Primitive Peoples*. 2d ed. St. Louis, 1883.
- Findley, Palmer, *Priests of Lucina*. Boston, 1939.
- Jarcho, Julius, *Postures and Practices During Labor Among Primitive Peoples*. New York, 1934.

RICHARDSON, WILLIAM LAMBERT

- Irving, F. C., *Safe Deliverance*. Boston, 1942.

SEWALL, SAMUEL

- Chamberlain, N. H., *Samuel Sewall and the World He Lived In*. Boston, 1897.

— Sewall, S., *Diary of Samuel Sewall, 1674-1729*. 3v. (In Collection of the Massachusetts Historical Society. Boston, 1878-82. Ser. 5, v.5-7).

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

SHIPPEN, WILLIAM, JR.

— Flexner, J. T., *Doctors on Horseback*. New York, 1937.

Gibson, J. E., *Dr. Bodo Otto and the Medical Background of the American Revolution*. Springfield, Ill., 1937.

Thacher, J., *American Medical Biography*. Boston, 1828.

Thoms, H., "William Shippen, Jr., the Great Pioneer in American Obstetrics." *Amer. J. Obstet. Gynec.*, 1939, 37: 512-7.

Toner, J. M., *The Medical Men of the Revolution*. Philadelphia, 1876.

STEARNS, JOHN

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

WHITE, JAMES PLATT

Thoms, H., "James Platt White and Demonstrative Midwifery." *Amer. J. Obstet. Gynec.*, 1934, 28: 287-92

WILLIAMS, JOHN WHITRIDGE

Slemons, J. M., *John Whitridge Williams*. Baltimore, 1935.

WRIGHT, MARMADUKE BURR

Loving, S. "Biography." *Trans. Amer. Med. Assoc.*, 1880, 31: 1098-101.

Thoms, H., *Chapters in American Obstetrics*. Springfield, Ill., 1933.

INDEX OF NAMES

A

Academe de Medicine 100
 Ackerly, S. 118
 Adair, F. L. 139
 Alexander, William 44
 American Gynecological
 Society 136
 American Medical Association
 133, 135
 American Philosophical
 Society 117, 118, 125, 126
 Anne of Denmark 16, 35, 42
 Arantius 23
 Aveling, J. H. 34, 39

B

Bainbridge 134
 Baltimore College of Physicians
 and Surgeons 138
 Barber Surgeons Company 35
 Bard, John 71
 Bard, Samuel 67, 70-74, 125,
 140
 Barlow, James 83
 Baudelocque, J. L. 74-75, 141
 Bayerland 7
 Belleview Hospital Medical
 College 133
 Berkshire Medical Institution
 109
 Bill, A. H. 139
 Boerhaave, Hermann 76
 Boivin, Mme. Marie 124
 Boston Dispensary 138
 Boston Lying-in Hospital
 138, 145

Boswell, J. 46
 Boswell, James 69
 Bourgeois, Louise 15
 Boyle, Robert 42
 Bradley, Widow 10
 Braxton-Hicks, J. 124, 128
 Breckenridge, Mary 19
 British Medical Association 75
 Buffalo, University of 132, 133
 Burney, Fanny 69
 Burton, John 75-77, 83
 Bute, Lord 63
 Butter, Alexander 48, 55

C

Cambridge University 36
 Canterbury, Archbishop of 36
 Catholic Maternity Institute 20
 Cawardine, Henry 45
 Chalmers, Thomas 91
 Chamberlen, Hugh, Jr. 43, 44
 Chamberlen, Hugh, Sr. 29, 39,
 40-42, 46
 Chamberlen, Paul 43
 Chamberlen, Peter the Elder
 16, 34, 35, 36, 39
 Chamberlen, Peter the Younger
 34, 35, 36
 Chamberlen, Peter III 36-39,
 42-44
 Chamberlen, William 34, 35, 50
 Channing, E. T. 93
 Channing, Walter 93-94, 138,
 140
 Channing, W. E. 93
 Channing, W. E. II 95

Chapman, Edmund 48, 55
Chapman, Nathaniel 126
Charles I 25, 36, 45
Charles II 38, 43
Charles IX 24
Charlotte, Queen 16
Chatham, Earl of 63
Chipman, W. W. 139
Church, John 126
Clark, James 87, 92
Clarke, John 125
Codd, Mrs. 44
College of Physicians 36, 37,
39, 65
Collins, Robert 104
Columbia University 17, 73, 74
Cotton, John 13
Cragin, E. B. 138
Crede, C. S. F. 120-121
Cullen, William 53, 56, 62, 69,
71

D

Dartmouth Medical School 98
Das, Kedarnath 50
Davis, E. P. 139
DeLee, J. B. 52, 139
Denman, Thomas 66-67, 126,
141
Dennis, Alice 16
Desgranges 118
van Deventer, Henrik 27, 29,
31
Deweese, W. P. 75, 126-128,
146
Dickinson, R. L. 139
D'Orleans, Duchess 15
Douglas, James 53, 62
Drake, Daniel 134
DuCoudrey, Mme. 15
Duges, Marie 15

Duncan, Dr. 89
Duncan, Matthews 124-125
Dusée, N. 46, 76
Dyer, Mary 13

E

Eastman, N. J. 20, 147, 148
Edgar, J. C. 139
Edinburgh Obstetrical Society
81
Edinburgh, University of 71,
105
Eliot, Jared 10

F

Fasbender 31
Felkin, R. W. 80
Findley, Palmer 30, 139
Finley, Samuel 67
Foster, Jane 83
Fothergill, John 69, 71
Francis, J. W. 73
Franklin, Benjamin 71, 125
Freke, Mr. 48
Frontier Nursing Service 19

G

Galen 7
Garrick, David 69
General Lying-in Hospital 31
George I 31
Georgia, University of 131
Gibbon, Edward 63
Giffard, Walter 48, 55
Gist, Dr. 134
Glasgow, University of 53, 62
Goldsmith, Oliver 53
Gordon, Alexander 102, 105-
107, 110
Green, C. M. 139
Gregoire 46, 55, 65, 76

Guillemeau, Jacques 23, 24, 82
Guy's Hospital 121

H

Halsted, W. S. 132
Harris, Dr. 84
Harvard College 11
Harvard Dental School 97
Harvard Medical School 109, 139
Harvey, William 24-25
Harvie, John 61
Henrietta Maria 36
Henry III 24
Henry IV 15, 24
Henry VIII 9
Henry, Thomas 104
Hervieux 100
Highlands and Islands Service 19
Hippocrates 4, 7, 34, 101
Hirst, B. C. 138, 139
Hodge, H. L. 110, 126, 129-130, 137, 140, 141
Hodge, Hugh 129
Hody, Edward 48
Hogarth 48
Holmes, O. W. 97, 102, 105, 106, 107-111, 125, 130, 131, 140
Horner, W. E. 129
Hosack, David 137
Hotel Dieu 22, 29, 125
Hull, John 84
Hume, David 63
Humphreys, David 73
Hunter, John 27, 53, 62, 63, 69, 102
Hunter, William 27, 53, 56, 62-63, 64, 66, 69, 102, 141
Hutchinson, Anne 13, 14

I

Indiana, Medical College of 137
Indiana, University of 137
Indianapolis College of Physicians and Surgeons 137

J

James, Abel 125
James I 16, 25
James, T. C. 125-127, 138, 139
Jefferson Medical College 131, 133, 136, 137
Jenner, Edward 92, 119, 120
Johns Hopkins Hospital 20, 141, 147
Johnson, Samuel 53, 55, 69
Johnstone, R. W. xi, 57
Jonas, Trynte 10
Joris, Hellegond 8
Julius Caesar 80

K

Kargeredec, Viscount 122
Keep, N.C. 87, 97, 125
Keith, Dr. 89
Kelley, H. A. 21, 141
Kemball, Mrs. 44
Kemble, Fanny 95
King's College 71, 73
Klein, Professor 112
Knox, John 106
Kolletschka 113, 116
Kuhn, Adam 125

L

LaChapelle, Louise 15, 124
Laennec, R. T. H. 122
Laing-Gordon, W. 89
Lee, Alice 69
Lee, Thomas 69

Lejumeau, J. A. 122
 Leopold, Prince 87
 Lever, J. C. W. 121, 144
 Levret, Andre 50, 75
 Lex Caesarea 80
 Lex Regia 80
 Lincoln, Abraham 61
 Lister, Lord 80, 92
 Litzmann, C. C. T. 124
 London Lying-in Hospital 96
 Loomis, H. N. 132
 Louisville University Medical
 Department 134
 Louis XIII 15
 Louis XVI 15
 Ludwell III, Philip 69
 Lusk, W. T. 85
 Lying-in Hospital, London 105
 Lying-in Hospital, Vienna 112
 Lying-in Infirmary, Manchester
 102
 Lynch, F. W. 139

M

Mackenzie, Colin 69
 Manchester Royal Infirmary
 102
 Manningham, Richard 31, 56
 Marischal College 105, 125
 Mary, Queen 42
 Mauriceau, Francois 24, 27,
 29, 30, 31, 39, 75
 Massachusetts General Hospital
 93, 138
 Massachusetts Medical Society
 119
 Maternity Center Association
 18, 19, 20
 Mather, Cotton 1
 McKelway, John 128
 Medical Chirurgical Society
 (London) 45

Meigs, C. D. 90, 95, 110, 129,
 130-132, 137, 140, 141
 Meigs, Josiah 131
 Meigs, Vincent 131
 Mercurio, Scipione 23, 82
 Michaelis, G. A. 124
 Middlesex Hospital 56, 67
 Middlesex Lying-in Dispensary
 105
 Midwives Institute 19
 Miller, C. J. 139
 Miller, Henry 133-134
 Montejan, Colonel 22
 Morris, Robert 125
 de la Motte, Manquist 27, 30,
 31

N

Naegele, F. C. 30, 124
 Newborough, Lord 63
 New Jersey, College of 67
 Newton, Isaac 42
 New York Academy of Medi-
 cine 118, 136
 New York Dispensary 73
 New York Library 73
 New York Lying-in Hospital
 128
 New York Medical Society
 (England) 76
 New York State Medical
 Society 118
 Nightingale, Florence 18
 Nihell, Mrs. 57
 North, Lord 63
 Nufer, Jacob 81

O

Ohio Medical College 128, 137
 Orange, William of 42
 Osborne, William 125
 Osler, William 111

Ould, Fielding 64-66
Oxford University 36

P

Padua University 24, 36
Paget, Rosalind 19
Paget, Stephen 22
Paradise, John 69
Paré, Ambroise 21, 22, 24, 34,
124
Paris, Medical School of 75
Parkman, Professor 97
Partridge, H. G. 48
Parvin, Theophilus 30, 135-137
Pasteur, Louis 80, 100, 101,
102, 107
Pennsylvania Historical Society
126
Pennsylvania Hospital 69
Pennsylvania Maternity
Hospital 138
Pennsylvania, University of 70,
75, 118, 125, 126, 128, 129,
137
Pepys, Samuel 42
Pesth, University of 112, 115
Peterson, Reuben 139
Peu, Phillipe 24, 30, 31
Philadelphia, College of 70
Philadelphia General Hospital
138
Phillips, Elizabeth 10
Physicians and Surgeons, Col-
lege of (New York) 71
Physicians and Surgeons, Col-
lege of (Baltimore) 138
Pinard, Adolph 123
Polak, J. O. 139
Portal, Paul 24, 30, 31
Prescott, Oliver 119
Princeton Theological
Seminary 137

Pringle, John 69
Pugh, Benjamin 50, 83
Putnam, Mrs. W. L. 145

Q

Queen Charlotte's Hospital 31

R

Radcliffe, W. 48, 50
Rathlaw, J. P. 46
Raynalde, Thomas 9
Reynolds, Joshua 53
Richardson, W. L. 138, 139
Rock, John 149
Rockingham, Earl of 63
van Roonshuysen, Hendrik 43,
46
Rosalind, Dame 19
Rosslin, Eucharius 7
Rotunda Hospital 64, 104
Royal College of Physicians 35
Royal Society 41
Rush, Benjamin 93
Russell, Alexander 71

S

Sancroft, Archbishop 39
Sanger, Max 85
Scarffenberg 39
Schwartz, Henry 139
Seamon, Valentine 137
Semmelweis, I. P. 102, 105,
107, 111-116
Sennert, Daniel 82
Sergeant, Erastus 118
Sewell, Samuel 11
Shakespeare, William 95
Sharpe, Jane 16
Sheldon, Archbishop 39
Shippen, Wm., Jr. 67-70, 125,
126, 137, 140
Shippen, Wm., Sr. 67

Shoemaker, Sister Theophane
 20
 Siegmundin, Justine 14, 27
 Simmons, W. 84
 Simpson, J. Y. 87, 89, 90, 91,
 92-93, 125, 140
 Sinclair, William 114
 Slemons, J. M. 143, 145
 Sloane Maternity Hospital 138
 Smellie, William xi, 21, 27, 46,
 50, 53-61, 63, 64, 83, 141
 Smith, William 126
 Smithson, Elizabeth 10
 Snow, John 87
 Socrates 14
 Sophia, Princess 42
 Soranus 4, 5, 6, 7
 Smollett, Tobias 53, 55, 59
 Spencer, H. R. 33, 63, 66, 75,
 76
 Sproul, Dr. 65
 St. Anthony's Fire 118
 St. Bartholomew's Hospital 24,
 48, 125
 Stearns, John 116-119, 125
 Steele, Rev. Dr. 137
 Sterne, Laurence 53, 57, 69, 75
 Stevens, Margaret 15
 St. George's Hospital 62, 66
 St. Mary's Hospital 102
 Storer, D. H. 138
 Store Street Lying-in Hospital
 125
 St. Rochus Hospital 115
 St. Thomas's Hospital 18, 71
 Studdiford, W. E. 139
 Suffield, John 44

T

Temkin, Owsei 7
 Thoreau, H. D. 95
 Thorpe, Goodwife 10

Transylvania University Medi-
 cal Department 134
 Trinity College 65
 Troutman of Wittenberg 82
 Tufts, Mary 31
 Tully, William 119
 Turner, William 124

V

Velpeau A. A. L. M. 131
 Victoria, Queen 15, 87, 122
 Virchow, Rudolph 115

W

Waldie, Mr. 89
 Walker, Chamberlen 44
 Walker, William 44
 Ward, G. G. 139
 Washington, George 71
 Watson, B. P. 17, 19
 Watson, Mary 132
 Webster, Professor 97
 Webster, J. C. 139
 Weeden, Goodwife 11
 White, Charles 102-104, 110,
 144
 White, J. P. 132-133
 White, Thomas 102
 Williams, J. W. 129, 139, 141-
 142
 Williams, Roger 13
 deWindt, Paul 46
 Wistar, Caspar 126, 129
 Wren, Christopher 41
 Wright, M. B. 124, 128-129

Y

York Hospital 76
 Yale College 118, 131
 Yale School of Medicine 19,
 148