1971

# Year Book OF OBSTETRICS & GYNECOLOGY

GREENHILL

# THE YEAR BOOK *of* OBSTETRICS *and* GYNECOLOGY 1971

EDITED BY

J. P. GREENHILL

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Thornton (Am. J. Obst. & Gynec. 109:671, 1971) in his Presidential Address before the American Association of Obstetricians and Gynecologists proposed the establishment of a Board of Advanced Certification in gynecologic oncology. Advanced training in this area is not designed to produce an operative technician. One should produce a physician especially trained in all phases of the treatment of gynecologic malignancy. This person should have completed no less than 3 years in an approved residency and prior to being certified for advanced training would have successfully passed an examination of the American Board of Obstetrics and Gynecology. Three additional years of training in gynecologic oncology would be required for advanced certification by examination. Since the internship is no longer required, the total program would be completed within 6 years after graduation from medical school. If this comes about, it will be necessary to establish a certifying body whose relationship to the American Board of Obstetrics and Gynecology would be closely related. Idealistically, physicians trained and certified in these programs will become directors of centers and programs throughout the United States whose primary concern will be improvement in the treatment and care of women with malignancy of the reproductive system. It is unfortunate that a country with our resources permits such inadequate treatment for gynecologic malignancy, as frequently illustrated by patients who are eventually referred to our present centers after having received inadequate initial therapy.

J. R. Wilson (Obst. & Gynec. 36:178, 1970) presented the Presidential Address before the American College of Obstetricians and Gynecologists. His subject was "Health Care For Women: Present Deficiencies and Future Needs." He spoke on what he considered the most pressing and important responsibility of the Fellows of the College during the next few years: improving methods for delivering health care to women. Recent studies suggest that we are rapidly falling behind in meeting the increasing demands for obstetric-gynecologic care. There are many solutions but they can be grouped under three main headings: (1) the use of trained nonphysician associates, (2) a change in the education and practice of obstetrician-gynecologists and (3) reorganization of hospital departments of obstetrics-gynecology. Two or more obstetrician-gynecologists working together can care for more women more efficiently and with less investment of time than can the same number working alone. Wilson's basic thesis is that educational programs, practiced patterns and the concept of the professional role of obstetrician-gynecologists must change if we are to provide adequate health care for women, not only in the distant future but during the next few years. We are only now beginning to realize that most obstetrician-gynecologists are overtrained for the jobs they do and many are undertrained for what they attempt. A considerable portion of time in most residencies is devoted to learning how to perform major operative procedures. This is given higher priority than the development of obstetric skills. A doctor who chooses to be an obstetrician rather than an obstetrician-gynecologist or a surgical gynecologist could work in a special group.

Hofmeister (Am. J. Obst. Gynec. 107:657, 1970) made the Presidential Address in 1969 before the Central Association of Obstetricians and Gynecologists. His subject was "Comments on Three Major Problems Faced by the Specialty in 1970." He said obstetrics and gynecology faces a serious dilemma—lack of manpower (the number of persons, physicians and nurses, or associated personnel necessary to deliver adequate care to patients). Of the 308,630 physicians in the United States in 1967, only 4% were involved in our specialty. Over 10% of the 13,000 physicians listed as obstetricians and gynecologists do no obstetrics. Hofmeister favors the establishment of preceptorship programs. Selected students can be assigned for a 2-month period to concerned and qualified physicians. Four hundred students between their sophomore and junior years or during their junior year can be enlisted and paid an appropriate stipend each month. All efforts to attract manpower to medicine and specifically obstetrics and gynecology will fail unless one of two great existing obstacles is removed. The first is unnecessary and often thoughtless interdisciplinary criticism. A second major obstacle is the man-made threat of malpractice. The annual premiums in Wisconsin are now $1,500 and in California, $7,000. Hofmeister stressed the seemingly unsolvable problem of the shortages of registered nurses, licensed practical nurses, nursing assistants, surgical technicians and physician assistants. There should be concerted efforts to enlist the services of men as a source of the additional 25% nurse manpower necessary. Presently, men constitute less than 1.5% of the total nursing help. The present existence of men in nursing must be better known to the public so as to help decrease the impression that nursing is exclusively a woman's field.

Wulff (Am. J. Obst. & Gynec. 109:1105, 1971) presented the Presidential Address before the 1970 meeting of the Central Association of Obstetricians and Gynecologists. The title of his talk was "Part of the Solution or Part of the Problem?" The problems involved are as follows: too many babies, too few students, too few doctors entering residency in obstetrics and gynecology and too few specialists for the job to be done. Part of the solution consists of fewer babies, increased medical school enrollment significantly and quickly, exposure of more students to our specialty through all the years of their schooling and encouraged training and utilization of allied health personnel. Also, we should encourage and help train the new family physician and bring the family physician back into the picture of total obstetric care. Wulff believes that the first step must be the elimination from the specialist's practice of the necessary but time-consuming process of normal prenatal care. This can be done adequately in the specialist's practice by paramedical personnel and very well done in the practice of the family physicians as part of their continuing health care for their patients. Prenatal clinics for the medically indigent must be established. Hospitals should be geographically selected throughout the country to serve as "obstetric centers."

G. W. Douglas (Am. J. Obst. & Gynec. 107:150, 1970) chose as his subject before the New York Obstetrical Society "The New Generation." He deals with the generation that is crowding upon us. The new generation

is perhaps the best-qualified group of students he has ever seen. Their admittance to medicine was against the keenest competition. Their aptitude tests are the highest yet encountered. We should begin to concern ourselves with our replacements. Obstetrics and gynecology is in deep trouble, not because of the constipated state of scientific advance, not because of inattention to the lowering of perinatal mortality, but because of our inability to establish obstetrics and gynecology as one of the major disciplines beyond dispute not only in medicine but also in health. We are approaching a time of considerable peril for our discipline. The deans are cutting into obstetric teaching time and seem determined to make obstetrics a paramedical, public health problem. It is possible that the new generation may find little appealing in a discipline with stereotyped programs of training in which the steps of advancement are carved in stone with an inflexible tempo and in which societies and organizations are heavily concerned with self-regard and with keeping out those who are less qualified. There are several ways in which we can deal with this problem. One way is difficult, painful and even humiliating to some extent since it implies past failures. This way is to anticipate the demands for reform and to present to the new generation the picture of a discipline that is changing itself to meet the needs of the future. We must open up our institutions to the residents so that they can develop a responsible sense of participation instead of having decisions affecting mainly their interest made for them by individuals trained a quarter of a century ago. We must convince the new generation that obstetrics and gynecology is a field alive to the social challenges of tomorrow as well as today and that we look forward to their arrival.

Stallworthy (Proc. Roy. Soc. Med. 63:491, 1970) presented the President's Address before the section of Obstetrics and Gynaecology of The Royal Society of Medicine. The subject was "New Wine in Old Bottles: Team Concepts in Community Medicine." He said that there were policy decisions to make before it is too late but decisions achieve nothing unless implemented. We are involved in evolutionary and revolutionary developments that affect all of us. The form of medical practice we have known will be scarcely recognizable in another decade. It has long been taught that you cannot put new wine into old bottles. When these were goatskin containers that dried and cracked when empty, this was true. It is no longer correct. The wine of which Stallworthy speaks is modern medicine and time may well confirm the excellence of its vintage. The bottles constitute the media by which it is made available. They vary greatly in shape and size. In fact, the potential of some has still not been explored. They include doctors, midwives, nurses and ancillary aids. Certain qualities of the new wine of modern medicine are becoming clear. Three are worthy of review: (1) increasing emphasis on the patient as a member of society; (2) teamwork as the key to progress; and (3) expanding hospital influence throughout the community. Just as earthenware jars and glass bottles replaced skins for the storing and conveying of wine, so must radio, television and films be explored more vigorously as educational channels between doctor and public. They have a tremendous potential for good or ill. It is now usually teamwork rather than individual effort that brings success, and slowly this

fact is being accepted by the profession. At least 70% of all obstetric patients in England and Wales could be cared for by practitioner-obstetricians if they were members of an efficient area team. The third point deals with the influence with which a hospital must extend beyond its gates to the community from which its patients come. Demands on the hospital service will continue to change, although a more positive attitude toward health and rehabilitation should reduce to a minimum the time spent in a hospital. Ultimately this will affect the type of hospital required and possibly decrease the national cost of the service. The new line promises to be exciting, although palates will differ in assessment of it. The bottling is in the hands of obstetricians and gynecologists.

Probobh Das (J. Obst. & Gynaec. India 20:147, 1970) delivered the Sir Kedarnath Das Memorial Oration. His subject was "The History and Evolution of Forceps," the title of the book his father wrote in 1929. Sir Kedarnath Das not only wrote this outstanding classic but he also acquired about 100 different varieties of forceps from all over the world, which included the rare Chamberlen forceps. All of these are now preserved in the R. G. Kar Medical College Museum along with many obsolete and rare obstetric instruments. (I had the privilege of seeing this collection in Calcutta in 1956.) Das presents the milestones in the development of the obstetric forceps. The instrument was invented in 1601 by Peter Chamberlen, the Elder. In 1720, Palfyn made the first public exhibition of forceps. In 1733, Chapman first published an article dealing with forceps. In 1747 and 1751, Levret and Smellie, respectively, introduced a pelvic curve to the forceps. In 1850, Simpson used forceps and a vacuum extractor. In 1879, Tarnier added axis traction to forceps. In 1912, Das devised the Bengal forceps for special patients. In 1915, Kielland invented a straight forceps. In 1925, Barton produced the anterior-posterior forceps. In 1929, Piper devised a forceps for the aftercoming head in breech presentations. In 1950, Thierry devised spatulas. In 1955, Leff described his special forceps. In 1956, Shute presented parallel forceps and in 1968, Laufe advocated diversion forceps. Das points out that today there are over 600 varieties of obstetric forceps, but surprisingly the original features of the Chamberlen forceps invented in 1601 still form the basis of all obstetric forceps. Forceps during the first 150 years were applied to the sides of the pelvis without regard to the position of the fetal head. After the addition of the pelvic curve, high forceps operations were in vogue, very often with disastrous results to the child and to the mother. The rapid increase in the rate of forceps operations in recent years, albeit the simultaneous increase in the rate of cesarean section, unequivocably proves the usefulness of forceps in the modern practice of obstetrics.

Parker (J. Reproductive Med. 4:149, 1970) chose as his Presidential Address before the Association of Professors of Gynecology and Obstetrics the subject "The University's Responsibility In Residency Education." He said it is time that we provided a learning opportunity for four categories of residents: (1) the family physician with obstetric and gynecologic training (1 year); (2) the general obstetrician and gynecologist (3 years); (3) the intradisciplinary specialist (4 or more years); and (4) the academic gynecologist (5 or more years). Within the framework of

each department we should foster certain major changes: (1) drop the cumbersome double name of Obstetrics and Gynecology and accept Department of Gynecology; (2) attract students to the discipline of gynecology by embracing human reproduction as our basic science; (3) abolish the internship, bring the consultant to the gynecologic ward for purposes of teaching and for patient care, and send the resident to the medical, surgical, psychiatric or community health disciplines for part of his elective subspecialty; (4) establish the core curriculum for residency education; (5) recognize immediately the intradisciplinary specialties of endocrinology, oncology and fertility; (6) promote community hospital residency affiliations in order to strengthen the programs and to increase the total number of house officers; (7) support community health through regional medical programs and comprehensive care; (8) study postgraduate education since there is no satisfactory means of self-education and evaluation in existence today; (9) develop mechanisms for in-service residency examinations, specialty certification and subspecialty certification; and (10) improve communications, abolish the "publish or perish" grant and faculty promotion mechanisms, and eliminate many local, regional and national societies.

# OBSTETRICS

## PREGNANCY

### PHYSIOLOGY

**Fertilization and Cleavage In Vitro of Preovulatory Human Oocytes.** In animals, fertilization of oocytes in vitro and in vivo after their maturation in culture results in embryos incapable of sustained growth; fetal development to full-term is achieved by recovering oocytes just before ovulation and completing their maturation in vitro before fertilization. R. G. Edwards, P. C. Steptoe and J. M. Purdy[1] studied the fertilization and cleavage in vitro of human ova recovered by laparoscopy just before ovulation.

Patients were given injections of human menopausal gonadotropin and chorionic gonadotropin to induce follicular growth and maturation. Laparoscopy was performed 30-32 hours after the injection of human chorionic gonadotropin, and each follicle was aspirated separately. The oocytes were suspended in droplets consisting of fluid from their own follicle (where available) and the medium being tested for fertilization. Ejaculated spermatozoa, supplied by the husband, were added. Between 12 and 15 hours after insemination, the oocytes were gradually transferred from the medium used for fertilization into various other mediums for cleavage. All mediums were adjusted to a pH of about 7.3. A total of 38 embryos cleaved in culture. Two pronuclei were observed in many of them. Almost all eggs cleaved twice, and a few completed their fourth cleavage.

The embryos were inspected at various times during culture. The first cleavage occurred before 38 hours postinsemination. The second cleavage occurred between 38 and 46½ hours in 7 embryos cultured in Whittingham's medium or Ham's F10 and the third cleavage between 51 and 62 hours in 4 embryos. The fourth cleavage occurred before 85 hours in embryos grown in Ham's F10. The embryos were left in culture until it was clear that development had ceased, that is, about 48 hours after the previous recording of cell division.

One or more embryos were produced from 29 of the 49 patients under treatment.

► [Edwards and Steptoe have been pioneers in the fascinating field of obtaining human ova, fertilizing them and observing their growth in the early stages.

In animals, when ova have been obtained from the ovaries by aspiration through laparoscopy and then fertilized, there has been a large number of abnormal conceptuses.—Ed.]

**Cleavage of Human Ova In Vitro.** H. M. Seitz, Jr., G. Rocha, B. G. Brackett and L. Mastroianni, Jr.[2] (Univ. of Pennsylvania) developed an in vitro system in which human follicular oocytes can complete the maturation process and undergo cleavage after exposure to spermatozoa.

Follicular oocytes were recovered from fresh surgical specimens obtained at various times in the menstrual cycle. The oocytes were incu-

(1) Nature, London 227:1307-1309, Sept. 26, 1970.
(2) Fertil. & Steril. 22:255-262, April, 1971.

bated for 24 hours at 37 C. in a 5% $CO_2$ in air atmosphere in F-10 culture medium containing 20% human serum and sodium estrone sulfate, 25 μg./ml. medium. Human spermatozoa incubated in the uterus of a midcycle rhesus monkey for 4 hours were used for insemination. The ova were incubated further and examined at intervals for cleavage.

Of 50 ova inseminated with monkey uterine-incubated spermatozoa, 8 cleaved. None of 15 ova inseminated with washed ejaculated spermatozoa and none of 5 incubated in monkey uterine washings without spermatozoa had cleaved when examined 72 hours later. Normal-appearing 2-12 cell stage ova were observed. A 2 cell ovum was observed 40 hours after insemination. Two to 6 cell stage ova were seen at 52-54 hours after insemination. A 12 cell stage ovum was observed at 72 hours after insemination.

The evidence for the occurrence of in vitro fertilization included observations of spermatozoa in and around the zona pellucida, two polar bodies, progressive cleavage stages, chromatin in some of the blastomeres and failure of control ova to undergo cleavage. Failure of cleavage after exposure of ova to washed ejaculated spermatozoa and normal cleavage after exposure of ova to monkey-incubated spermatozoa suggests a need for human sperm capacitation.

► [Seitz, Brackett and Mastroianni (Biol. Reproduction 2:262, 1970) evaluated the fertilizability of the ovulated rabbit ovum prior to exposure to any mechanical or biochemical influence of the oviduct. A total of 183 ova recovered directly from the surface of the ovary following ovulation was studied. The first 70 ova were examined for cleavage at various intervals after in vitro insemination. The in vitro rate of fertilization was 81%. None of the 40 control ova cleaved in the absence of spermatozoa. Fertilization was confirmed by the birth of 1 genetically dissimilar live young after the transfer of an in vitro fertilized ovum into a recipient doe. Of the 2 black checker rabbits used as recipients, the first showed 2 apparently normal implantations and a third undergoing regression 7 days after 3 in vitro-fertilized ova were placed into her fallopian tubes. None of these implantations proceeded to term. The second recipient received 3 four-cell ova and was not subjected to laparotomy during gestation. Twenty-nine days after ovum transfer, a white living offspring was born. (See the preceding article by Edwards, Steptoe and Purdy and the 1970 YEAR BOOK, p. 363, for the article by Steptoe and Edwards, who tested various regimens of hormone treatments and assessed the follicular response by laparoscopy and follicular aspirations in 46 infertile women.)

Kondo (Acta obst. et gynaec. japon. 17:115, 1970) designed a study to explore the maximum length of time during which rabbit ova would be fertilized and also to determine the implantation ability of these fertilized ova. In addition, this report deals with chromosome studies of blastocysts after fertilization of aged ova. It was demonstrated that the rate of fertilization was slightly increased when the oocytes recovered from the follicles stimulated by HCG were transferred. The probability of fertilization of the ovum was highest at the time of ovulation and remained at the level of over 50% for 3-4 hours, but after this time the probability dropped rapidly to the level of 11.1% at 5-6 hours after ovulation. The probability of implantation of the ovum was shown to become lower than that of fertilization at the same duration after ovulation. The author could not find a chromosomal abnormality in the rabbit blastocysts after fertilization of aged ova.

Clewe and associates (Am. J. Obst. & Gynec. 109:313, 1971) made an effort to determine the postovulatory age of human ova based on morphologic criteria. Nine ova recovered from 132 patients are described. Case reports include menstrual data, time of operation, basal body temperature, location of ovum in the female tract and histology of the corpus luteum and the endometrium. Ovular morphologic characteristics are no better than other criteria of time of ovulation. – Ed.]

**Prostaglandins in Reproductive Physiology** are discussed by Leon Speroff (Yale Univ.) and Peter W. Ramwell[3] (Stanford Univ.) on the basis of a review of the literature. Prostaglandin (PG) is the generic name for a family of biologically active lipids. There are four major groups identified by the letters E, F, A and B, which correspond to par-

(3) Am. J. Obst. & Gynec. 107:1111-1130, Aug. 1, 1970.

ticular ring structures. The numeral in the subscript position after the letter indicates the degree of unsaturation in the alkyl and carboxylic side chains. Prostaglandins are biosynthesized from the C-20 essential fatty acids by cyclization and introduction of molecular oxygen; the enzyme system is associated with the microsome fraction.

Prostaglandins are present in menstrual fluid, umbilical cord, amniotic fluid, decidua, proliferative and secretory endometrium, semen and vesicular glands, but the greatest number of different prostaglandins (at least 13) and the highest concentration are found in human seminal plasma. Prostaglandins are absorbed from semen deposited in the vagina.

In nonpregnant myometrium, the PGE compounds, which predominate in semen, inhibit contractions, whereas the PGF compounds, which predominate in menstrual fluid, stimulate contractions. Increased sensitivity of the myometrium at ovulation may be related to a physiologic role for prostaglandins at coitus.

A single intravenous injection of $PGE_1$ or $PGE_2$ during midpregnancy caused a rapid increase in uterine tone with some minor small contractions. In term and near-term patients, the amplitude increased more than the tone. The difference in dose that stimulated intensity and frequency of contractions compared with the dose that increased tone was very small. Therefore, the PGE compounds are not suitable for induction of labor. In contrast, the work of Karim and associates (1968) suggests that the PGF compounds have oxytocic properties. They have successfully induced labor in 33 women with $PGF_{2}\alpha$.

The effects of various prostaglandins on the human fallopian tube in vitro have been studied. $PGE_1$ had a stimulatory effect on the proximal segment and an inhibitory effect on the distal 3 segments; $PGE_2$ increased the tone and maximum amplitude of the proximal segment and inhibited the remaining segments; $PGE_3$ inhibited all 4 segments. $PGF_{2}\alpha$ had a strong stimulatory effect on all segments, even greater than its effect on uterine muscle. On the ovary, prostaglandins appear to have a stimulatory effect in vitro and an inhibitory effect in vivo.

Prostaglandin research carries with it a very real possibility of practical application. Perhaps most exciting is the work which suggests possible roles in luteolysis, ovum transport and implantation.

► [Kirton, Pharriss and Forbes (Biol. Reproduction 3:163, 1970) injected subcutaneously prostaglandin $E_2$ ($PGE_2$) or prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) or infused them intravenously into pregnant monkeys. Subcutaneous injections terminated pregnancy in 8 of 13 animals when given between day 30 and 41 and beyond day 100 of pregnancy. Intravenous infusion terminated pregnancy of 3 of 7 animals between days 30 and 40. Progestin levels were usually depressed within 24-48 hours after the initial administration of prostaglandin, whereas uterine contractility was increased within 20-30 minutes. Prostaglandin $E_2$ was about 10 times as potent as $PGF_{2\alpha}$ in causing uterine contractions; intravenous infusion caused maximal uterine contractions during the latter half of pregnancy.

Embrey and Hillier (Brit. M. J. 1:588, 1971) report that in a preliminary study of 15 patients the clinical effectiveness of prostaglandins as abortifacients when administered by intrauterine instillation compared favorably with the intravenous route. Abortion was successfully induced in 14 women. The average total dose of prostaglandins required was about one-third the amount needed intravenously and side effects were minimal.

Roth-Brandel, Bygdeman and Wiqvist (Acta obst. et gynec. scandinav. (supp. 5) 49:1, 1970) compared the influence of prostaglandin $E_1$ ($PGE_1$), oxytocin and ergometrine maleate (Methergine) on the contractility of the pregnant human uterus in vivo experiments on 8 early pregnant and 14 midpregnant women. The substances were administered intravenously. With the doses used, $PGE_1$ and oxytocin caused a marked elevation of tone, whereas