he receives extreme unction, this is of importance as indicating the state of mind. It will be found a most useful practical rule in these cases first to ascertain the state of mind of the dying person, and after that an expression by him that he has no hope of recovery, then to listen to a recital of the story of the crime.

It is because of a failure to proceed in this way that physicians frequently obtain an account of a crime which cannot be used in evidence, and it is more often because of inadvertence than want of knowledge; but the result is equally disastrous so far as a successful prosecution is concerned. Particularly is this true in abortion cases, in many of which, apart from the evidence obtained at the autopsy, there is no testimony save the dying statement of the person operated upon, which by reason of the carelessness or ignorance of the person hearing the statement is worthless as evidence.

Another form of declaration of deceased persons made competent evidence by a recent statute which will be likely to call physicians into court to some extent hereafter is the law passed in 1898, Chapter 535 of Massachusetts Laws; this will be used in civil cases only; it is entitled, "An Act Relative to the Declarations of Deceased Persons." It reads: "No declaration of a deceased person shall be excluded as evidence on the ground of its being hearsay, if it appears to the satisfaction of the judge to have been made in good faith before the beginning of the suit and upon the personal knowledge of the declarant."

In closing this paper it is proper, perhaps, to say that in speaking on the occasional failure of some person to comply with the exact legal requirement of the particular situation, it is with no desire to criticise, but on the contrary with a full recognition of the aid received from physicians and also of the fact that in most instances every requirement of the rules of evidence is complied with. The abortionist, the poisoner and the murderer would often have very little to fear from the best efforts of lawyers seeking to prevent crime were it not for the skill, the watchfulness and the fearlessness of the trained minds which trace the evidence of subtle poison or the course of the murderer's bullet. Without this assistance, in many instances the law would be helpless, and the fact that detection is made certain by the attainments of these scientific men restrains the criminal by bringing close to him the certainty of detection.

A CASE OF EXTRA-UTERINE PREGNANCY.[1]

BY FRANK HOLYOKE, M.D., HOLYOKE, MASS.

On December 5th, at 2 A. M., I was summoned from police headquarters to view the dead body of a woman who, though unmarried, called herself Mrs. Eugene S., of Boston. She had been visiting a friend in Holyoke for the previous three days. Her history and habits for the past sixteen years had not been a credit to her sex. The friend whom she was visiting stated that the deceased had visited her on the 6th of last July and again on the 15th of September, on each occasion complaining of considerable abdominal pain. On this her last visit, she reached her friend's house December 1st, at 11.20 P. M. On the second day she went out in the morning and did not return until evening; on the third she lay down most of the day, and on the fourth she went out after dinner and came back at 4 P. M., complaining of terribly severe pain in the belly. At 8 o'clock she began to grow weak, very restless and pale, calling for water continually. She was conscious until near the end; refusing to see the priest or physician. She died at 1.15 A. M., three-quarters of an hour before I viewed the body. The body was still warm. There was at this time no rigor mortis.

On making a vaginal examination I was unable to reach the os, but through the anterior vaginal wall, which protruded forcibly into the vagina, I could very readily feel ballottement of a floating body of a size which would indicate that she was at least five months pregnant. The posterior cul-de-sac bulged prominently as though filled with fluid. There was no trace of blood in the vagina nor history of hemorrhage. Through the very thick abdominal wall a tumor could be felt rising from the pelvic cavity as high as the umbilicus.

The body was removed to an undertaker's ware-room, where, nine hours and a quarter after death, the autopsy was made. The body was that of a woman thirty-six years of age, weighing about one hundred and sixty pounds; the skin surface was pale; there was marked absence of livid spots; the belly was much distended. The abdominal walls were very fatty. Large, black, tarry clots covered the omentum, and the abdominal cavity was filled with clots and serum. Beneath the omentum there was found what looked, at first sight, like a large, ruptured ovarian cyst with a very vascular wall, to which the omentum and intestines were extensively and firmly adherent. This cyst lay between the folds of the right broad ligament. It reached as high as the umbilicus. The cyst wall was ruptured in the upper anterior part.

The uterus was pressed high up out of the pelvic cavity to the left, which accounts for my inability to find the os by vaginal examination before the autopsy. This abnormal position of the uterus was produced by the combined pressure of extravasated blood in the posterior cul-de-sac and the forcible bulging of the tumor anteriorly. I doubt if the uterus was so hard to reach prior to the rupture. The uterus was six inches long, the cervix softened and filled with mucus. The body of the uterus was soft and thickened proportionately to its size, though the enlargement was more in the long axis. The lining of the uterus was softened and very pale.

The tumor was ruptured at the site of the placenta. In breaking up adhesions the sac wall tore readily, showing, beneath, the amnion, unbroken and adherent throughout to its covering, which was composed of the anterior and posterior layers of the broad ligament; the pregnancy being tubal in origin, and primary rupture having occurred in the early months. The amnion contained a six months fetus, lying transversely with its breech toward the right ilium.

I could find no hematoma or other evidence of earlier hemorrhage, though such probably took place to some degree at the time of the primary rupture of the tube into the broad ligament; in such a case the hemorrhage is usually less than when it occurs in the abdominal cavity, and the fetus is more likely to live and to continue developing until destroyed by secondary hemorrhage into the placenta, or into the general peritoneal cavity by a secondary rupture of the sac.

[1] Read before the Massachusetts Medico-Legal Society, February 7, 1900.

The pelvis of the right kidney was very much distended, as was also the ureter, and this was caused by pressure of the tumor and its firm adhesions. The lungs were perfectly healthy. The gall-bladder contained one calculus. All other organs of the body showed a tendency to fatty degeneration.

She had been treated last September for what was pronounced as rheumatism in the right buttock and thigh, which, however, was probably a mistaken diagnosis, as her regular physician tells me that she had never suffered with rheumatism before. But many of these cases of extra-uterine pregnancy complain of intense pain following along the course of the sacral-plexus distribution.

With apology, I add to my report of this case a few notes from some of the latest literature on the subject, which, being of interest to me, will, I hope, not weary my listeners; for, with the exception of appendicitis, nothing seems to have interested the surgeon and gynecologist more than this subject during the past few years; and while they are discussing the treatment and proper time for operation it behooves us to consider the subject from its medico-legal side, if in a hasty review of a few of the peculiar anomalies which interest us, we can find some facts or theories to work from which may increase the importance of this subject in forensic medicine.

Most writers believe that it has been proved that the normal place of impregnation is in the tube. How much, then, may we be helped by a review of the supposed causes of the occurrence of tubal pregnancy? Some authors think that the larger percentage of these cases occurs among the lower classes, attributed chiefly to their malnutrition; while others believe that the hard work or straining at heavy lifting is a chief cause of arresting the ovum in the Fallopian tube. But we read that other possible causes are fright or shock; and that catarrhal or other inflammatory diseases of the tube, or any diminution of its lining epithelium, or any mechanical obstruction in the nature of new growths within the tube, or pressure from abdominal or pelvic tumors, have also been demonstrated as causes of the arrest of the ovum in the tube.

Dr. T. A. Stoddard,[2] however, presents the history of a few cases to illustrate what he considers a plausible theory, that the large majority of cases of tubal pregnancy, if not all, are impregnated just prior to a menstrual period.

It has been considered that, as a rule, tubal pregnancy follows a sterility of some years, but to this rule there are many exceptions. It occurs both in multiparæ and in those who have never given birth, and with many complications.

We find, for example, cases of tubal pregancy occurring two or three times in the same individual. Tubal twin gestation has also been reported. A number of cases have been collected of ovarian or tubal pregnancy together with normal uterine pregnancy; "the mother, in one case, being delivered at full term of two healthy, well-developed children."[3]

In fact, extra-uterine fetation carried to maturity is not exceptional, and laparotomies performed near the end of gestation with living extra-uterine child are no longer rare, but "the fruit is not only short-lived but deficient in development,[4] both physical and mental."

I would say that if our old and beloved instructor in anatomy were among us, Dr. Oliver Wendell Holmes, he might explain a reason for this deficient development of these record-breakers of our genealogical tree, for I well remember in one of his lectures, in referring to the calibre of the Fallopian tube, he straightened himself up to his full height, which was indeed majestic, when he spoke with emphasis, and looking very seriously at the class said: "Just here, gentlemen, I want you to understand that not one of you is any better than I am, for we have all passed through the sixteenth of an inch."

The diagnosis is often very difficult, but has been made before operation as early as the second week, although for a diagnosis to be made before the fourth or fifth week is very unusual, even for the most expert gynecologist. Primary rupture occurs more often within the first three months, most frequently in the second and third. However, it may take place in any month.

Cessation of menstruation is not always a symptom of extra-uterine pregnancy; but the menstrual irregularities may induce us to suspect the possibility of its existence. In case of rupture and the throwing off of the decidua from the uterus, we have symptoms which closely resemble a miscarriage. It is advisable that the physician examine the patient with the possibility of finding a tubal pregnancy. In a case of hematocele this also becomes our duty. Hemorrhage may occur by rupture of distended vessels upon the surface of the sac.

This completes the few points which occur to me as of special interest to the medical examiner in connection with a report of the specimen. But I ask myself of what immediate value, medico-legally, is the autopsy of a case where the history and view, together with external and vaginal examination, all point to rupture of an ectopic sac, unless we may thereby help to solve some question connected with the administration of justice? May we not expect to discover approximately at what time she conceived? Can we not help to prove or disprove an attempted abortion? Or may we not be the means of freeing a fellow-practitioner from suspicion of malpractice, as did Dr. Flavian Krug in an interesting case where the physician in charge was believed to have given poison by mistake; the death of the patient from rupture of the sac unfortunately following his hypodermic almost instantly?

Such and possibly other questions may arise in a given case. But the most valuable notes on this specimen you will now have the pleasure of listening to from Dr. F. W. Whitney, who has carefully examined and prepared it for the Warren Museum, as a peculiarly interesting addition to the study of this subject.

ANATOMICAL REPORT BY DR. W. F. WHITNEY.

The specimen consists of the uterus and adnexa. The uterus is enlarged, the extreme length 14 centimetres. The wall is thickened, the cervical portion measures one centimetre, the fundus measures three and a half centimetres, and the breadth of the fundus is eight centimetres. The interior of the uterus is lined with a soft, slightly shaggy and irregular membrane varying in thickness from two to four millimetres and was somewhat folded. The cervix is dilated and filled with tough mucus, the glands about the orifice being large and distended with the same material.

[2] American Gynecological and Obstetrical Journal, January, 1897.
[3] H. Ludwig: Wien. klin. Wochensch., July 2, 1896.
[4] L. E. Frankenthal: American Gynecological and Obstetrical Journal, September, 1896.

On the left side the ovary and tube are normal. On the right side the tube is normal for a distance of a few centimetres and then is lost on the surface of a sac 21½ centimetres in diameter.

There are no adhesions between the uterus and the tumor, which is cystic in character and lies between the folds of the broad ligament. On the upper part the covering is more or less torn and reveals a shaggy mass which is divided into two parts — one measuring about seven centimetres, in which is a considerable hemorrhage; and the other about five centimetres in diameter, which is pale and bloodless. This shaggy coat is partly lifted up and reveals a fetus of apparently about the sixth month, lying in an unruptured amniotic sac. The fluid surrounding the fetus is of a dark bluish-red color. No ovary could be detected on this side.

The diagnosis is a retroperitoneal pregnancy originating in the tube, and apparently about the sixth month. A decidua was present in the uterus.

THE MARKS PRODUCED BY PISTOL SHOTS.[1]

BY G. DE N. HOUGH, M.D., NEW BEDFORD, MASS.

THE object of this research was to ascertain what inferences could be drawn as to calibre of weapon and distance from which it had been fired from the marks produced on the skin or clothing.

The material used was as follows: One .22-calibre revolver of unknown make capable of using either long or short cartridges. With this I used Winchester Co.'s .22 short cartridge containing 3 grains of powder and 30 grains of bullet; the same make smokeless cartridge containing 1½ grains powder and 30 grains bullet; the Union Metallic Cartridge Co's. .22 short and .22 long cartridge whose exact contents of powder and bullet I was unable to learn. All .22 cartridges are rim fire, and it is not probable that the Union Co's. differs much in charge from the Winchester's. Judging from the mark, however, the former uses a coarser grained powder. In .32 calibre I had several pistols: (1) A Young America, double action, centre fire, with a 2-inch barrel firing a short .32 U. M. C. Co.'s cartridge with 10 grains of powder and 88 grains of bullet; (2) Hopkins & Allen's Mfg. Co.'s Dictator, single action, rim fire, 3-inch barrel, with a Winchester .32 short cartridge, containing 9 grains of powder and 82 grains of bullet; (3) Hopkins & Allen Co.'s X. L., double action, rim fire, 3-inch barrel, with Winchester .32 short, containing 9 grains of powder and 82 grains of bullet, and U. M. C. Co.'s .32 long, containing probably 13 grains of powder and 90 grains of bullet (this is what their long centre fire, .32 and W. Co.'s long rim fire .32 contain); (4) Iver-Johnson Arms & Cycle Works, double action, tip up, automatic ejector, centre fire, 3-inch barrel, with U. M. C. Co.'s .32 short, containing 10 grains of powder and 88 grains of bullet, and also with the U. M. C. Co.'s .32 short smokeless, containing about 4 grains of powder and 90 grains of bullet. In .38 calibre I had: (1) American Bull-dog, double action centre fire, 2½-inch barrel with U. M. C. Co.'s short .38, containing 15 grains powder and 146 grains bullet; (2) a Belgian imitation of Smith and Wesson's Automatic Ejector, double action, 3⅝-inch barrel, with same cartridge as in previous pistol, also with the .38 central fire S. & W. cartridge of the United States Co., of Lowell; (3) a Colt's single action, 7½-inch barrel with U. M. C. Co.'s .38 long Colt's, centre-fire cartridge, containing 18 grains of powder and 150 of bullet. I had finally an old-fashioned Derringer of .41 calibre and 2⅜-inch barrel requiring a .41 short, rim-fire cartridge. I had great difficulty in obtaining ammunition for this pistol, and that which I did get was without label on the box, so I cannot tell by whom it was made. The W. Co.'s cartridge of this size contains 13 grains powder and 130 of bullet. It is probable that the cartridges I obtained contain about the same charge. I regret very much that I was unable to procure any pistols of larger calibre and that my outfit was so limited, and I wish to point out here, once for all, that my conclusions are based on experiments with the above-mentioned weapons and ammunition, and refer only to the marks produced by them. Whether any modification of my conclusions will be rendered necessary by experiments with other calibres and ammunition, I of course cannot say.

Method of experimentation. — I had an apparatus constructed which would enable me to measure the distance of the muzzle of the pistol from the target within one-eighth of an inch and at the same time hold the pistol securely while not preventing the recoil or the upward jump of the muzzle at the instant of firing. As targets, I used a variety of things — various sorts of leather, cloth and paper. Whatever material I used, the character of the mark was the same. I used white blotting paper most extensively because the mark could more easily be seen, and because it was my opinion that powder grains would embed themselves in it about as easily as in the human skin. Now while the character of the mark is the same, its appearance varies much with the different materials, so that, given a powder mark on a piece of clothing, I should consider it extremely advisable to confirm one's opinion as to the weapon and the range by actual experiment with similar pieces of cloth.

Results. — The same pistol at the same range with similar ammunition produces the same mark. The mark consists of (1) the bullet hole; (2) the burn; (3) the smut; (4) the tattoo. Beyond a certain distance, a pistol mark consists only of the bullet hole. This distance depends upon the calibre of the weapon and the size of the powder charge. Thus for a .38 long Colt, central fire, which is loaded with 18 grains of powder and 150 grains of lead, fired from a Colt's revolver of 7½-inch length of barrel, I could get no mark except the bullet hole at a distance of anything over 11 feet. As we approach the target, the tattoo begins to develop. This consists of unburned powder grains and droplets of the grease with which the bullet is lubricated. With the pistol and ammunition above mentioned the tattoo is well defined at a range of 7 feet, but the individual grains are widely scattered. Further diminution of the range results in a condensation of the tattoo, the individual grains getting closer together, the whole mark covering a smaller area, and there being a larger and larger number of the grains close to the bullet hole. It occurred to me to count the grains in the marks by means of the device which I now show you. In general it is undoubtedly true that there are more grains

[1] Read before the Massachusetts Medico-Legal Society, February 7, 1900.