drying up of a leaf, the manner in which it dries up on the edge as a rule more particularly than in the center and the manner in which the majority of fruit rots or decays at the point of a bruise. There is a tremendous amount of harm done through the bruising of the margin of the gum, whether it is done by improper brushing of the teeth, poor dental work, or the impaction of food in the interdental spaces. These are the exciting causes of pyorrhea. Dr. Flanagan's question, "Is there a man who can restore lost tissue?" must necessarily be answered in the negative. I have had several very severe cases during the past winter in which there appeared to be a gum flap lying over the tooth, with no tendency toward attachment at any point. I snipped that off with scissors, in some cases exposing the tooth almost down to the apex. It is astonishing in many of these cases the amount of firmness that is regained after the source of irritation and accumulation of filth has been removed. I believe that the tooth even though it be exposed for one-third the length of the root might be retained, as many temporary teeth are at times retained, and remain very firm with practically no root remaining, as is frequently noticed.

DR. H. S. HASLETT, Pittsburgh: The statement was made a moment ago that the fault of poor dentistry lies with the teaching in the colleges. The fault lies more with the following out of the teaching after the student gets into practice himself. We find in many instances that young men going into practice will neglect the most intricate part of their work, will forget technic, and take short cuts across lots in order to reach a conclusion rather than to go by the beaten path through which they were led during their college course. Not more than three weeks ago a young man who had been in practice for three years, brought a piece of bridge-work to me and asked me to criticize it, and he walked out of the office because I said he was never taught to make a bridge such as that, and that as soon as he could forget this kind of work, just so soon would he begin to progress in the profession and not until then. That was the case of a young man who had been in practice a short time. Last week a student just finishing his freshmen course came to me to ask if he had failed. I told him that he had; and he said, "I believe that dentistry is a big graft game, and I am sorry that I cannot go on." "If that is the way you feel," I said, "now is the best time to get out; we do not want you, if you feel that dentistry is a graft." What would you expect of that man if he went on? How would he prepare cavities, how would he fill teeth, how would he treat any conditions that he came in contact with, with that idea of graft before him? Now, we do not teach graft; we teach dentistry, and if they become grafters after that, it is not the fault of the college, but the fault of the student.

DR. M. H. FLETCHER, Cincinnati: In answer to Dr. Flanagan, I do not think that the physiologic repair of tissues can be measured by halves or quarters. One tissue may repair more than another, and I believe with Dr. Fisher, that when there is nothing left that will bring about repair, that teeth should be removed for the purpose of asepsis. Nevertheless, after study of the conditions, if I can distinguish any tissue left in the socket of the tooth, it is worth an effort to try and save that tooth. I have seen many cases in which teeth have become useful regardless of stress. I can show any number of radiographs taken one, two or three years after the case had been in hand, in which there has been repair. An artificial substitute of itself would be more or less a continual cause for sepsis. How many people who have removable pieces in their mouths keep them as clean as they should be? Now, it is up to us to know enough about the laws of physiology of repair and about pathology to be able to distinguish these conditions when we see them. If the doctor's degree does not give that knowledge what is the degree for? I object to Dr. Talbot's use of the term "end-organ." His condemnation of the alveolar process, saying that it is transitory, does not mean to me what it does to him, for in an animal which has progressively growing teeth, the alveolar process is continually reforming as long as that animal has that tooth, and as long as it lives. Why does that animal not

have this disease around the teeth? Look at the ruminants, there is a hard tissue developed around their teeth, which when wounded heals as the skin would heal. It heals because of the physiologic principle for the organism to repair itself. That is the law of repair and growth, and it cannot be changed no matter what we think or try to do. It is my endeavor to teach every patient and I tell them that they cannot be my patients if they do not want to learn this. What I undertake to do is to replace with the tooth-brush in the hands of the patient everything that creates healthy gums and healthy connective tissue around the necks of the teeth. I do not see any difference between the method of repair of the tissues around the alveolar process and that in any other part of the body. The cementum will repair itself to a certain degree. They have originally the same process of forming bone. As far as the transitory conditions are concerned I do not see any difference excepting in environment which brings about the necessity for the animal to shed the teeth. Take the pachyderms, the elephants; elephant's teeth are continually shedding—until the time of death, as far as I know—and the physiologic process of building bone around each tooth is a natural histologic process in consequence of the demand of the animal for the teeth. The alveolar process is found in all ruminants, and the process is perfectly normal as far as I see.

DISEASES OF THE FALLOPIAN TUBES *

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The belief that all diseases or pathologic conditions of the fallopian tubes cause symptoms is fallacious. Pathologic changes in the tubes may be present for some time without giving rise to disturbing symptoms. It is important, therefore, to examine carefully, for the possible existence of pathologic conditions of the fallopian tubes, all women who consult us about diseases of the generative organs. This is particularly exemplified, for instance, in cases of catarrhal and interstitial salpingitis caused by gonorrheal infection, in which the tubal inflammation causes no marked symptoms and the physician is consulted only as to the cause of sterility. Should the physician, in such a case, make use of intra-uterine treatment, without realizing what the true condition is, a pelveoperitonitis is liable to result.

It is likewise fallacious to suppose, as many do, that women whose fallopian tubes are the seat of gonorrheal infection, particularly so if it be suppurative, are permanently sterile therefrom. So long as the inflammatory process has not caused an occlusion in a part of the tubal lumen, a cure of the inflammation is possible, and subsequent conception as well—this latter, however, only if the husband be entirely cured and if a restoration of the tubal mucosa to its normal condition take place. But, knowing of such possibility, we must be guarded, not only in our prognosis, but also in our therapeutic measures. We should not, in such cases, advise a surgical intervention which would prevent the possibility of a future impregnation, unless, after carefully weighing the subjective and objective symptoms, an intervention of such serious nature seems imperative.

We may lay at the door of gonorrheal salpingitis the cause of most tubal pregnancies. Any tubal inflammation which destroys the tubal epithelium to such an extent that the fertilized ovum is not conveyed to the uterine cavity will cause that mishap.

If we find the fallopian tubes objectively in a pathologic condition, and the patient complaining of dys-

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menorrhoea, of which she did not formerly complain, we may attribute that symptom to the inflamed adnexa. Inflammation of the adnexa, however, need not necessarily cause dysmenorrhoea. It should be borne in mind, though, that from the character of the dysmenorrhoea, the cause of it cannot be diagnosed with certainty.

Likewise, tubal inflammation may cause a change in the type of menstruation. The most common change in the type is menorrhagia, caused, however, not so much by the change in the tubes, as by the accompanying change in the ovaries, giving rise to an alteration in ovulation, which produces chronic hyperemia of the uterus. This explains not finding a thickened endometrium when one cures such patients for the relief of uterine bleeding. Sometimes, however, amenorrhoea may be the result of salpingitis. If the tubal disease does not cause pathologic changes in the ovaries, the menstrual type is not likely to be changed.

Pain, too, need not be a constant or necessary symptom of tubal inflammation, but if it be present, it is not a characteristic pain of any particular variety of tubal disease. In most instances, pain is caused by localized peritonitis. If the tubal sacs are exceptionally large, as occasionally occurs in pyo- and hydrosalpinges, pain may be caused by pressure of the sacrosalpinx. Furthermore, adhesions of the tubes to the intestines may be a cause of pain whenever peristalsis of marked degree is present. It is likely that, in some instances, colicky pain, which sometimes occurs, may be explained by contractions of the tube-wall. Exacerbations of pain and of local peritonitis are apt to occur in some forms of tubal inflammation, particularly those caused by gonorrhoeal infection.

The cause of the exacerbation can usually be elicited, if one is careful in taking the history. About the time of the menstrual period exacerbations are more likely to occur should the patient expose herself to wet, to cold, to sexual excess, to undue physical exertion, and so forth. Sometimes such exacerbation may be accompanied by symptoms of such severity that an operation at that time may appear imperative. Such is, however, seldom the case. With proper treatment the patients usually recover within two weeks; generally after the lapse of a week they are able to be about again. Exacerbations are indeed practically the only pathognomonic sign of tubal inflammation, particularly of those of gonorrhoeal origin. This may be ascribed to the micro-organisms in the tubal secretions in such cases. But that even very gross pathologic tubal lesions, of gonorrhoeal origin, too, may exist without causing marked symptoms, was again well illustrated to me a few days ago, in the case of a patient who had had symptoms for a number of years, and who had been advised to have herself operated on by every gynecologist whom she had consulted. For nearly a year she had been free from pain, and her only reason for now seeking advice was to know why she had not menstruated during the previous four months. The pelvis was filled with two large tubo-ovarian abscesses that had been diagnosed hitherto by others; the history of repeated attacks of gonorrhoea was distinct, as was also the recurrence of repeated attacks of pelveoperitonitis formerly; yet now only amenorrhoea was present as a symptom, accompanied by moderate leukorrhoea. It is very seldom, I admit, that we have absence of symptoms in the interstitial forms of salpingitis, particularly if, as is not infrequent, the infection has been transmitted to the

pelvic connective tissue, which may then cause more or less distortion of other structures within the pelvis.

Backache is a prominent symptom, usually accompanied by pain in the lower abdomen, most intense on the side corresponding to the tube most markedly affected.

It occasionally happens that a distended tube partly empties its contents into the uterus, if the uterine end is patent and if its position is not too low in the pelvis. Or the tube may become intimately adherent to the bladder or to the rectum, and a rupture may occur into either, and thus a part of the contents may be evacuated. I have never seen an instance of rupture externally, although this, too, has been reported by reliable observers. I recall one instance of spontaneous cure, but only one, from spontaneous rupture of the tube into the rectum.

Among other symptoms of salpingitis, neurasthenia is not a rare occurrence, brought about primarily by the undermined general health of the patient; and, perhaps, also by the dislike for sexual intercourse which often acts detrimentally on the general condition of such patients.

It may chance that a rupture of a distended fallopian tube takes place intraperitoneally. The symptoms resulting therefrom necessarily differ, according to the virulence of the tubal contents. The accident, if the contents be purulent, must always be considered as very serious—so serious that the abdomen should be opened and the necessary surgical work be done as soon as possible.

I believe that I was among the first, if not the first, to describe spontaneous rupture of pyosalpinges, and at the time I narrated the history of the cases seen by me. Since then a number of others have published similar experiences.

When one finds the symptoms of sudden collapse, with the knowledge that a pyosalpinx was probably previously present, then there is reason for an immediate surgical intervention, particularly should peritoneal symptoms be already present. The temperature may in these cases become quite high, especially if the rupture date back a day or more and the patient be nearing a fatal termination.

The exacerbations of gonorrhoeal pyosalpinges that are not infrequently found during the puerperium, associated with peritonitis, are so frequently mistaken for a true septic infection, for which the accoucheur is held responsible, that it is important to call attention to this condition. The symptoms are sometimes so grave that the patient's life may be endangered, but in the greater number of instances they subside after a few days, so that sometimes a *restitutio ad integrum* may take place.

DIAGNOSIS

From the foregoing it is obvious that, to establish a diagnosis of salpingitis, the fallopian tubes must be palpated. This can be done only by bimanual examination, and at times it will be necessary to resort to rectovagino-abdominal palpation under an anesthetic, and even to steady the uterus, and make traction on it with a tenaculum forceps, while palpating. Normal fallopian tubes, or those which are the seat of mild catarrhal inflammation, cannot readily be felt, if at all, unless the conditions for examination are favorable.

To make an accurate diagnosis it is necessary to distinguish the ovary from the tube, which one can do by appreciating the difference in consistency of the struc-

ture, when the two are closely attached to each other. But in addition to the palpatory findings, a history, taken carefully, is of the utmost value in coming to a conclusion, when a diagnosis is to be made.

The position of a fallopian tube which is the seat of inflammation, particularly of purulent inflammation, may be in various abnormal sites of the pelvis. For instance: I have seen the tube of one side elongated and distorted so that it was adherent to the tube of the opposite side. And, again, I have seen such tubo-ovarian abscess adherent to the fundus of the uterus, so that a uterine tumor was simulated.

In instances of tubal disease, in addition to securing a carefully elicited history and the objective pelvic findings, one should inspect the vulva, particularly about the urethra, and should carefully examine the small urethral ducts for evidence of the presence of chronic gonorrhea. Likewise the cervical secretion should be examined with the same object in view.

To make a diagnosis of tuberculous salpingitis, it is necessary to have other evidence of a like tuberculous condition than the mere presence of thickened tubes. If a tuberculous salpingitis has been present for some time, it is probable that other changes are discoverable which will aid one in making a correct diagnosis; the most positive of these is the finding of tubercles elsewhere, particularly if another infection can, with certainty, be excluded.

I do not believe it possible to make a positive diagnosis of tuberculous salpingitis in the early stages of the disease, when it is still limited to the deposit of small tubercles on the serosa of the tubes and when there is only a moderate thickening of the tubes. At least I, in such cases, have failed to make the diagnosis. I could, in three of these instances, only determine that there was an indurated condition of the tubes near to the uterus, resembling the salpingitis nodosa, first described by Schauta. The other part of the tubes, toward the abdominal end, seemed somewhat thickened.

To diagnose by palpation alone, whether a tube is distended by pus, serum or blood is not easy. I thought, some years ago, that I could distinguish by bimanual examination alone the difference between a hydrosalpinx and a pyosalpinx, but a few errors in succession taught me how erroneous was my belief. Even the examination of the blood, when the pus is confined to the interior of the tube, and the process is chronic, is not likely to aid us, because in such cases we are not likely to find leukocytosis.

The most reliable feature on which to make a diagnosis of pyosalpinx is the doughy sensation that a pyosalpinx imparts to the examining finger, rather than the fluctuating sensation that a hydrosalpinx gives. Furthermore, with pyosalpinx, we are likely to have, in the early stages, elevations of temperature, perhaps of pulse, particularly after a bimanual examination. In the case in hydrosalpinx the two principal features of pyosalpinx are more prominent.

In the case of a tubal gestation or to a moderate degree of tubal disease, the rupture of the tube or Douglas, a minor procedure, free from all risk, if properly done. The presence of free blood always suggests the suspicion of tubal gestation.

vagina, uterus and the underlying connective tissue; and in case of no previous pregnancy, the breast-changes are important. But still, despite all carefulness, one may sometimes be in a quandary as to the diagnosis, as the two following examples, cases recently seen, so well illustrate:

CASE 1.—A. F. was referred to me by Dr. Max Einhorn. The patient has been married two and a half years, but has never been pregnant. Menstruation is regular, at intervals of four weeks. For four weeks there has been atypical bleeding, which, during the last week, has been accompanied by intermittent cramp-like pain, lasting about five minutes; then, after a few hours of freedom from pain, recurrence of a similar attack. The uterus, on examination, was found to be sharply retroflexed, a trifle relaxed in consistency and seemingly a little larger. The right tube was prolapsed but seemingly normal; the left tube I failed to palpate. No pain was felt on moving the vaginal part of the cervix. There were no breast symptoms. Immediately after examination the patient fainted; her pulse became absent at the wrist. As soon as she rallied from the collapse, she complained of very severe pain in the lower abdomen. The whole picture, although there were no objective symptoms further than the relaxed uterus, pointed so strongly to a ruptured tubal gestation that, as soon as the patient had sufficiently rallied and a cessation of the pain had been brought about by scopolamin and morphin, I sent her to the hospital with a view to operating on her for that condition, should a more definite objective symptom present itself, and also because of the uterine displacement. By the following morning she was again in good condition, the bleeding excepted. Most careful examination under anesthesia failed to show on palpation any evidence of an hematocoele. Indeed, I failed even now to palpate the left tube. Such complete absence of objective symptoms was there that I did not consider it necessary to make the trivial culdesac puncture, but proceeded to curet, which procedure was practically negative, as was also substantiated by an examination of the scrapings in the laboratory.

The bleeding continued as before, likewise the intermittent pain, so that I felt conscience-stricken for not having entered the peritoneum; but then another bimanual examination, two days later, again failing to show objective signs, particularly no hematocoele, and no tenderness on moving the portio vaginalis—a sign, very reliable, if taken in connection with other objective symptoms, as already frequently stated by me—I determined to let the patient alone. I do not believe it proper—rare instances excepted—to open a woman's abdomen merely on suspicion.

CASE 2.—The second patient, seen on the same day, said that she had been curetted nearly four weeks previously by her family physician, with the object of destroying the conception product, of which she believed herself possessed. She has had atypical bleeding since, and also pain now and then, in the lower abdomen. The pain was described as a "heavy pain" at no time cramp-like. The pelvic examination was negative; but in view of the symptoms I was suspicious, believing that probably a curetting had been done in the presence of a tubal gestation. Five days later the palpatory findings verified this suspicion. On the following morning the diagnosis was verified by operation. The tube ruptured during operation.

In instances in which a tubal gestation has begun to be interrupted—in which the conception product is dead—the diagnosis is not likely to be difficult, unless the symptoms are atypical. The history in such cases is of great importance. In cases of doubt, certainty as to the presence or absence of tubal gestation may be obtained by making an opening into the culdesac of Douglas, a minor procedure, free from all risk, if properly done. The presence of free blood always suggests the suspicion of tubal gestation.

PROGNOSIS

The prognosis, so far as life is concerned, except in cases of malignant disease, is generally good. This is even true of tuberculous salpingitis, if recognized sufficiently early to be treated properly. The restoration of the patient to health, that is, to a normal condition, from a pathologic point of view, depends on circumstances. I believe, for instance, that cases of gonorrheal salpingitis, particularly when the result of an acute infection, will in the majority of cases result in a complete recovery, if properly treated, and if care be taken that renewed infection does not occur. To comply with the latter demand it is necessary that the source of infection be avoided until all danger of reinfection from that source has passed. The man should be carefully examined by some one who is competent to make such examination.

When closure of the fimbriated extremities of the fallopian tubes has taken place and when, as the result of this, the tubes have become more distended, the prognosis of a cure from a pathologic point of view is out of question. It is in these cases, too, that recurrent attacks of pelvic peritonitis are quite common.

The acute gonorrhoeal tubal inflammations occurring during the puerperal state present an especially serious aspect, particularly as to the symptoms which are present. The prognosis in these cases, if peritonitis has developed, seems almost positively fatal; and yet, if one keeps one's head and employs proper treatment, nearly all such women recover.

One of the chief features to be observed in affecting cures is to see that abstinence from sexual intercourse is adhered to.

The prognosis as to sterility after a gonorrheal salpingitis has been acquired is not readily answered. Much depends on the treatment that had been instituted; whether the severity of the disease and also its duration had been shortened. If both questions can be answered in the affirmative, it is likely that the prognosis from that side may be considered as "favorable."

TREATMENT

The principal factor in the treatment of tubal inflammation is absolute abstinence from sexual relation; and to bring this about the avoidance of eroticism. To secure this, it is necessary to individualize, to consider the surroundings and the social position of the patient. It is an easy matter for a physician to say that these factors should be avoided, but unless definite directions are given, the orders will not be followed. I know of nothing more difficult than the observance of this, the most important part of the treatment. In some — indeed in many — circumstances it is a physical impossibility.

Knowing that by the avoidance of sexual emotions, physical rest and proper hygiene the greater number of women with a first attack of tubal inflammation can be cured, one should not be hasty in advising a surgical intervention, especially one that will unsex a woman.

In addition to the fundamental principles of treatment, the use of copious hot-water douches, boro-glycerid tampons — either plain, or in combination with ichthyol — vaginal beluses of fuller's earth, made into a proper mass with glycerin, are remedies that give good results.

In cases in which we fail to bring about a cure, even though it be only a symptomatic cure, we may consider a surgical intervention, particularly in chronic cases, and those with recurrent attacks of pelvic peritonitis. But, I again repeat, one must not come too hastily to a conclusion that a surgical intervention is imperative.

the prognosis, from surgical interventions, has become so good in ordinary surgical work, there is much needless operating. Before an operation is performed in such cases, it is best, in the interest of the patient, to get the advice of an experienced gynecologist, a man who has devoted a sufficient number of years to that branch of medicine, and has observed the effect of treatment and of operations, to enable him to speak authoritatively. No one, not so trained, and not having such experience, is competent to advise correctly in such cases.

In acute tubal inflammation, when we have distended tubal sacs and if the pyosalpinges are attached to the floor of the pelvis, it is best to incise them *per vaginam*, to place a strip of gauze in the opening made and to drain. If it be a single large tubal sac, as is usually the case when it is a first infection, a number — the greater number — of such patients may be cured, providing the other rules of treatment, previously mentioned, are carried out, and if no reinfection take place.

To get the best results from a vaginal section, it is necessary to make it large. I usually make the section through the vagina large enough to enable me to introduce my hand through the opening. An opening so large has the advantage that one can feel with precision the condition of the pelvic organs. Moreover, the necessary work can be done intelligently; and last, but not least, the dressings, subsequently necessary, can be made with less pain to the patient. I use for this purpose the pelvic abscess instruments devised by me a number of years ago.

Conservative operations, such as mentioned, are useless if the tubes are sacculated. This cannot, however, be determined until one has the fallopian tubes in direct contact.

In regard to abdominal operations, in purulent inflammation of the fallopian tubes, I prefer the longitudinal incision, although many surgeons of late use the transverse, usually called the "Pfannenstiel" incision. My preference is caused by the liability of the abdominal parietes to become contaminated with purulent secretion during enucleation of the salpinx, and, should the pus be not sterile, we may have suppuration of the abdominal walls, which, if it takes place in the case of a transverse incision, is much more tedious to overcome than in the old form of incision. Moreover, in the horizontal incision, the muscles and fascia can easily be protected with the peritonæum, and contamination of the peritonæum with pus is not such a serious matter. Full pelvic elevation in these cases is desirable, so that one may see, and not work by the sense of touch alone, as was universally done formerly.

Before deciding on an operation, one should carefully consider every factor, since, as was mentioned at the beginning, tubal diseases do not always cause symptoms. Indeed, two patients with greatly distended tubes may, in the one instance, have no symptoms, and in the other symptoms so slight as not to attract attention. It is imperative, however, that the physician should have symptoms so serious as to make an operation imperative. And still more imperative is it that the physician should have significant symptoms in order to make an operation imperative. And still more imperative is it that the physician of extensive experience should be consulted in this. Another factor to be considered is the patient's general health. It is imperative that the patient be in good health before an operation is performed.