*Adamkiewicz⁵ claims to cure cancer by administration of trimethylvinyl ammonium. He claims that it has a physiologic effect similar to that of the toxin of cancer parasites. He claims that by autopsies made on persons dying from intercurrent diseases years after the employment of this drug have demonstrated the absence of cancer. His theory is that cancer may be killed by its own poison, like a person by his own carbonic acid.

CONCLUSIONS.

From a critical survey of the subject of the treatment of cancer of the uterus at the present day the following may be said: 1, we are rightly ignoring the aphorism of Hippocrates to the effect that "it is better not to apply any treatment to deep-seated cancer, for, if treated, the patients die quickly; but if not treated they hold out for a long time." We are striving to educate women and the general physician to the necessity of adopting means to arriving at the earliest diagnosis possible and that followed by prompt operation of a very radical kind; 2, special care in classification of the varieties of uterine cancer is essential to greater enlightenment concerning the history of that disease; 3, the employment of x-rays and radium are of little use and should not be employed in cases that are diagnosed sufficiently early to offer hope of eradication by surgical means; 4, the cautery in any form should not be employed as an alternative for radical surgery, but be limited to those cases that have passed the stage in which eradication by operation seems probable; 5, trypsin has not been tried sufficiently to establish its proper position and as it has not been proved to be superior to radical operation valuable time should not be employed in using this remedy in cases curable by surgery; 6, much is being done to alleviate the suffering and to postpone the fatal termination of those cases no longer amenable to radical surgical operation; 7, the experimental work on animals thus far done offers hope of some means, opsonic or otherwise, for a more successful and less dangerous and less difficult plan of treatment for this disease than radical surgery; 8, radical surgery affords the best results at present; 9, the vaginal route does not afford the greatest possibility for eradication; 10, we have reason to believe with Childe ("The Control of a Scourge") that this disease can be controlled; 11, rooms which individuals suffering from cancer have occupied should be fumigated before non-cancerous occupy the same and in the light of the authentic reported cases of immediate and mediate inoculation those caring for such patients should regard it as a contagious disease.

⁵ Bull. de l'Acad. de Méd. de Paris, 1906, 3 s., lvi, 290.

Liquor Cresolis Compositus as a Disinfectant.—The superior germicidal value of this official disinfectant is strikingly shown by some recent investigations. The United States Department of Agriculture formerly recommended a mixture of phenol (carbolic acid) and lime for the disinfection of cattle cars, but as it met with some objections it was determined to try liquor cresolis compositus of the U. S. Pharmacopeia as a cheaper preparation. Comparative experiments (Bulletin 100) showed that the mixture of phenol and lime was less efficient than phenol alone, but that the germicidal power of liquor cresolis compositus, even when made from the least active cresol, is nearly one and a half times greater than that of the same amount of carbolic acid. The germicidal efficiency increases with the boiling point of the cresol, orthocresol with the lowest boiling point being least efficient. Liquor cresolis compositus made from commercial cresols may exhibit unimportant variations in germicidal power owing to variations in the cresols.

Original Articles

HOW CAN WE LESSEN THE MORTALITY OF UTERINE CANCER?*

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The discussion of this subject becomes difficult at its onset because we do not know its cause. The ablest investigators have diligently sought to determine its origin and to lay bare the mystery of its development, but thus far in vain. The inclination of some of the best scientific minds has been to assign a bacteriologic cause, and numerous parasites have been accused of being responsible for its production, but later investigations have not demonstrated their presence as constant.

Efforts have been made to associate the various manifestations artefact cell inclusion and cell degeneration with some specific germ, but the apparent discoveries of one have not been substantiated by other observers.

The researches of Farmer relating to the existence and separation of the chromatic elements seems to afford an explanation for the origin of the disease in chemical reaction, but whether the impetus be imparted to congenital embryonal cells or be the result of parthenogenesis remains for future determination.

Clinical observations have made it evident, however, that the predisposition to the occurrence of malignant disease can be both congenital and acquired. Congenital predisposition or heredity may be considered the inheritance of increased vulnerability or decreased resistance and may occur independent of any family history of cancer. The lowered resistance which favors the onset of tuberculosis likewise makes the occurrence of cancer possible. In the great majority of cases, however, the predisposition is acquired through changes in cell structure as the result of prolonged or continual irritation. The history of the occurrence of cancer in the uterus seems to make this statement justifiable, as this disease occurs with the greatest frequency in that portion of the uterus, the cervix, which is most exposed to injury and irritation. Not only is this true, but it occurs in greater frequency in women who have given birth to children, or cases in which it is evident the cervix has had the greater opportunity to have been the seat of injury and futile efforts at repair. There are exceptions, it is true, in which cancer occurs in the cervix in women undoubtedly chaste, but these instances are so exceptional as to emphasize the rule. These statements accepted, it becomes evident that the treatment may be divided into preventive, curative and palliative, the first two of which only concern us in the discussion of the subject chosen for the title of this paper.

The value of the prevention of cancer can not be overestimated when we consider the insidious onset of the disease, its early invasion of the adjacent and even remote structures, and the grave prognosis in all cases in which it is recognized; it must be apparent that preventive measures are of the greatest importance.

Prevention comprises, first, the correction of all local conditions which promote irritation and result in the formation of new tissue. Every gynecologist, every

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-eighth Annual Session, June, 1907.

physician in general practice, is familiar with the influence produced on the uterus by a more or less extensive laceration of the cervix, especially if a careful aseptic management of the puerperium has been neglected.

The uterus remains large and heavy from ineffective involution, hemorrhage and leucorrhea are symptoms of the resulting endometritis, the woman complains of sensation of weight and dragging from the heavy organ, from hemorrhage after coition or exercise from the injured cervix. The longer the condition is permitted to continue without proper treatment the worse the complications become. The lips of the cervix are separated, and the endometrium thickened, filled with distended Nabothian glands, which, from obstruction of their ducts, become extensively everted. The torn surfaces are covered with granulations or cicatricial tissue, and in the angles this frequently presents a gristly hardness, pressing on the terminal nerves. The uncleanly, neglected patient, suffering from such a group of symptoms and physical signs, presents a condition which greatly simulates incipient carcinomatous degeneration. Inflammation of the cervix, even when not lacerated, leads to increase of connective tissues, proliferation of epithelium, obstruction and occlusion of the ducts of Nabothian glands, to their enlargement, to narrowing of the cervical canal, or the projection of the enlarged gland into the tissues of the cervix until its wall is penetrated, the glands show on the vaginal portion, and when extensive glandular involvement exists the entire cervix may have undergone this cystic degeneration. Is it surprising that malignant disease rapidly transcends its original source if it should become engrafted on a condition such as this?

Prolonged irritation may lead to alterations just as grave within the uterine cavity. Increase of connective tissue, obstruction of gland ducts, compression and atrophy of glands or their development into retention cysts which may be the origin of uterine polypi, increasing the tendency to hemorrhage and discharge. Similar conditions are produced by the retention of embryonal products as portions of placenta, membrane and blood clot after abortion, premature labor or delivery at full term, when infected, inflammation, slight or severe, results, dependent on the virulence of the infection, or the powers of resistance of the patient.

When non-infected such products may become partially organized and be retained for a length of time, producing the continual irritation of a foreign body. If we accept the theory which experience seems to establish, that continued irritation favors the development of malignant disease, then it becomes self-evident, in order to prevent its occurrence or limit its frequency, the physician must institute measures to avoid irritation and chronic inflammation of the pelvic organs. The evacuation of the uterus, whether during gestation or at its completion, must be effective and proper contraction of the organ secured. Injuries of the cervix and pelvic floor which are likely to produce subinvolution must be repaired and thorough asepsis practiced in the after-treatment. Where the patient comes under observation months subsequent to the injury and secondary conditions have developed, treatment must be adapted to the peculiar condition. In all such cases the uterus should be dilated and curetted and the cervix repaired by trachelorrhaphy when the mucosa is free from eversion and marked glandular disease.

It is folly to consider trachelorrhaphy when the mucosa is thickened, extensively everted and presents

glandular degeneration, for the operation in such cases but serves to obstruct uterine drainage and aggravate the subsequent condition. In such cases amputation of the cervix at the expense of its inner surface is the proper procedure.

The removal of all sources of irritation necessitates attention to displacements, to periuterine inflammation and to uterine myomata, particularly of the submucous and interstitial varieties.

Prevention of cancer requires, second, an investigation of the manner in which the various functions of the body are performed and the correction of disordered conditions of the gastrointestinal tract.

The ingestion of inordinate quantities of food, of food illy prepared, of unsuitable character and improperly masticated, necessarily results in decomposition within the gastrointestinal tract and the formation of toxins which produce a deleterious effect on various parts of the body. As a semi-excretory organ, the uterus is one which is likely to feel the effects of such chemical irritants. The diet should be carefully regulated, the inhibition of water encouraged, and constipation avoided. Lowered vitality should be combated by the ingestion of eggs and milk in large quantity, by outdoor exercise and in extreme cases by sleeping in the open.

The careful oversight of the patient as above cited affords the greatest probability for the early recognition of the development of malignant processes. The successful treatment depends to an extreme degree on an early diagnosis. The surgeon is accustomed to consider hemorrhage, pain and foul discharge as pathognomonic symptoms of carcinoma, and, fortunately, the profession is now so educated that it does not ignore the possibility of these symptoms. Much more rarely than formerly is it found that women are comforted for the presence of profuse menorrhagia or metrorrhagia by the assurance that they are undergoing the "change of life." It must not be forgotten, however, that there is no pathognomonic symptom of cancer. Hemorrhage just as or even more profuse may be associated with a number of benign conditions. Pain is a frequent symptom of every acute or subacute and of many chronic inflammations of the pelvic structures. Foul discharge may be associated with retained fetal products, retained inflammatory collections within the tubes, the uterus or the pelvis, and from carious and sloughing submucous fibroids. It is evident, then, that neither one nor all these symptoms can be accepted as positive assurance of the existence of carcinoma, but rather as a danger signal indicating the importance of prompt and thorough investigation to determine what is the threatened disaster. When the vaginal portion of the cervix is the seat of disease it is generally easily recognized even at an early stage. Involvement of the cervical canal is usually readily determined by the irregularly increased size of the cervix, a sensation of increased resistance affecting a part rather than the whole of this portion of the uterus. In early stages it may be necessary to dilate the uterus with tents, and even then to excise a portion for microscopic examination. Cancer affecting the body does not always increase the resistance of the organ, though in the majority of instances there is an infiltrated area which gives a sensation of rigidity and resistance. Occasionally I have seen cancer of the body develop in a polypoid gland and the proliferated tissue would fill the uterine cavity with a large cauliflower mass which stood in intimate relation with the uterine surface at only one point. We

can only hope to lessen the mortality of the disease by the thorough eradication of the organ and tissues involved.

What hope can be extended that even radical measures will afford escape from this dread disease? Unfortunately, no positive assurance can be given in any individual case that even the most radical procedure will be followed by cure. In one patient a vaginal hysterectomy for extensive destruction of the cervix in which but little benefit had been expected will be followed by years of freedom from recurrence. This has been my experience in a number of instances. A patient now comes to mind in whom the cervix was completely destroyed. A vaginal hysterectomy was done merely because I could not turn her away without an effort for her relief, yet more than ten years have followed free from recurrence. In other cases a slight involvement of the cervical canal or even of the body of the uterus for which an extensive abdominal hysterectomy has been done have been quickly followed by a recurrence, which has rapidly progressed to a fatal termination. Our acquaintance with the tendencies of the disease are not sufficient to enable us to determine what course it will pursue in any individual case. It is possible that the course is not so much dependent on the disease processes as on the characteristics of the individual affected. If due to a chemical reaction, then the continual presence of a large quantity of the reagent in contact with cells prepared to develop under its stimulation tends to promote the rapid progress or extension of the disease. Experience has demonstrated that the earlier in the life of the individual the disease occurs, the more rapid its progress.

Experience has taught me to give a very unfavorable prognosis when cancer of the uterus appears prior to the age of 40 years. Possibly the hopeless outlook is, in part, due to the greater activity of the lymphatic system, the vessels of which decrease in size and number with the advent of the climacteric.

The route by which the disease shall be attacked is still the subject of controversy; the majority concur that the entire uterus should be extirpated when any portion of it is the seat of cancer. Not only should the entire organ be removed, but the excision should be, if possible, beyond the limits of the extension of the disease. As it is possible only to determine minute nests by the microscope, as much parametrial tissue should be removed as safety of the important structures of the pelvis will permit. In recent years many surgeons have advocated the thorough removal of the nearest lymphatic glands. As it is impossible to be certain that all non-infected glands are removed, it is wiser to follow the procedure of Wertheim and attempt only those which are infected as shown by enlargement. Schauta has disclosed that the enlargement of glands is frequently extended to the lumbar glands alongside of the abdominal aorta and, consequently, beyond the reach of the surgeon's knife. In order to insure the most effective removal of the disease the abdominal route should be the one of selection, inasmuch as it affords an opportunity to inspect the entire field, determine to some degree the extent of involvement and keep under observation important structures. It permits of the ligation of the uterine arteries external to the line of the ureter and in extreme cases the ligation of one or both internal iliacs. In extensive involvement it is important to extend the operation to the removal of a considerable portion of the vagina.

There is, however, a class of cases in which the vagina presents a route attended with less danger and with almost equally favorable results. It should be selected when the abdomen contains a large quantity of fat or where the condition of the patient is such that she gives but little promise of enduring a more protracted operation.

In conclusion, I would summarize my answer to the question asked as the title of this paper as follows:

1. The employment of measures at confinement and subsequently to secure a healthy condition of the pelvic organs.
2. The employment of constitutional measures to prevent the formation of gastrointestinal toxins and to obviate their baneful influence on the tissues of the body.
3. The careful study of pelvic symptoms in order to insure the early recognition of malignant disease.
4. The resort to early operation for the removal of the organ involved and all the circumjacent tissues that regard for the safety of important structures, such as the ureters, bladder and large pelvic vessels, will permit.

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DISCUSSION.

DR. THOMAS S. CULLEN, Baltimore, agreed with Dr. Bovée in that reliance must be placed on early diagnosis, and that in the late stages of carcinoma an operation is of no value. The instruction of the laity as to the early signs of carcinoma he considers a subject of the greatest importance. The committee of which Dr. John G. Clark is chairman, is carefully surveying the best means of instructing the public. The results of their labors will undoubtedly be of the greatest benefit. Dr. Cullen did not concur in the statement that the classification of cancer of the uterus is in a jumbled condition. It is true, he said, that no two cases of cancer of the uterus are exactly

Wertheim's parametrial forceps.—These forceps are ten inches long, are very stout and have a short curved crushing surface. They control the parametrial tissue and vaginal veins very thoroughly, and on account of their shape the ligature, when drawn tight, tends to slip under a forceps much more readily than when the ordinary forceps are employed.

alike. There are three different varieties of epithelium of the uterus: (1), Squamous epithelium from the vaginal portion of the cervix, (2) the high cylindrical epithelium lining the cervical canal and the cervical glands, and (3) the low cylindrical epithelium lining the uterine cavity and the glands of the body. From each of these epithelia there springs a definite variety of carcinoma. Dr. Cullen has found it interesting to note the multiplicity of pathologic processes that may be present in the organs removed from one pelvis. In one instance he found (1) a subperitoneal adenomyoma; (2) multiple interstitial uterine myomata, (3) primary adenocarcinoma of the body of the uterus, (4) left pyosalpinx, and (5) a primary adenocarcinoma of the left ovary. The malignant growths in the uterus and ovary were entirely independent of one another, being of totally different types. Dr. Cullen emphasized that time is a very important factor in abdominal myomectomy for carcinoma. In doing the Wertheim operation the rapid removal of the parametrial fat is greatly facilitated by the employment of eight or ten Wertheim parametrial forceps. These are very long, exceedingly strong, and have a slightly curved beak, as shown in the illustration. By their use the operator is able to save at least half an hour. Dr. Cullen again emphasized that too much emphasis can not be placed on the necessity for using the utmost celerity, consistent with careful work, in abdominal hysterectomy for carcinoma. Dr. Cullen's experience coincides

with Dr. Montgomery's in that cervical lesions are responsible for carcinoma of the cervix. In nearly every instance where a malignant cervical growth developed the patient had one or more children. In cancer of the body of the uterus, he stated that a different etiologic factor seems to be operative. Many of these patients have never been pregnant. Endometritis seems in some way to favor the development of carcinoma of the uterine body. In the examination of about 1,350 cases of myoma he found carcinoma of the body 27 times. This fact, he thought, suggests that there may be a definite relation between myoma and the carcinomatous development.

DR. G. BETTON MASSEY, Philadelphia, has had good success in two cases of very early carcinoma of the cervix from the use of a modification of the zinc-mercury cataphoretic method described by him at the New Orleans meeting of the Association. The method embraces the use of zinc points, amalgamated with mercury, long enough to reach the cervix, the points being dissolved by the electric current and the nascent chemicals driven into the diseased tissue. The modification of the method has been to repair from using ether, but to push the treatment up to the limit of endurance of the patient. The treatment is repeated daily. At the end of ten days the slough is allowed to come away. Dr. Massey finds that he can use as much as 200 mp. for half an hour without real discomfort to the patient. A calculation will show that 200 mp. for ten half-hours equals 1,000 mp. for one hour, which is capable of killing a mass nearly as big as the first, if it is done at once. By this gradual method all risk of penetrating the peritoneal cavity is avoided. This method has the added advantage of freedom from infection of the healthy tissues, which is probably at times caused in cutting operations for cancer of the cervix by the vaginal route.

DR. MARGARET CLEAVES, New York City, has had a somewhat extended experience with trypsin in the treatment of malignant conditions during the past year, and in every case there was relief from pain, improved appetite, digestion and metabolism, modification to control of discharge and odor, with tumefaction, softening, even to breaking down and in some instances a degree of absorption of tumor masses. This experience has been without exception in postoperative and inoperable cases the following classification: (1) Intestinal surgical interference, (2) postoperative, (3) inoperable, (4) metastases, (5) non-malignant. Dr. Cleaves has found encouragement, aside from the clinical condition alluded to, in the physiologic action of the pancreatic enzymes, establishing as they do, when superposed on malignant tissue, tissues rich in glycogen—an eosinophilia. This is established in the second to the third week of treatment, steadily increasing to a maximum at which it is apparently held when the patient progresses favorably. In fatal cases it drops to a minimum before death. Trypsin seems to show a selective action for malignant tissue and in every case treated by Dr. Cleaves the trypto-glycogenic reaction was present in greater or less severity, varying with the degree of malignancy, characterized by chilly sensations, to severe chill, rise in temperature, nausea, malaise and headache, save in the single case of Class 5. This case followed an absolutely uneventful course. So different was this from all other cases, postoperative or not, that Dr. Cleaves requested the surgeon referring the case, who stated that the pathologist's examination showed carcinoma, to give her the pathologic findings and a slide. This was done and the latter was pronounced benign by her own pathologist, an opinion that was confirmed by eminent pathologists in New York City, by the State Cancer Laboratory at Buffalo and by Dr. John Beard of Edinburgh. There was no trypto-glycogenic reaction, but greatly improved metabolism and a gain of twenty pounds in two months. Dr. Cleaves was of the opinion that trypsin should, in the present state of our knowledge, be used universally in connection with surgery.

DR. H. J. BOLDT, New York City, stated that the employment of preventive measures in uterine cancer is one of the important factors and by many not sufficiently considered. Another feature is that of age. He believes that in the majority of instances when malignant disease occurs prior to the age of 30 years, the persons affected are doomed. He recalled only one

such young person, who did not have an early recurrence following radical operation. In a person well advanced in age, beyond 50, where one can recognize the existence of malignant disease at an early date, and where it has not invaded the structures beyond the uterine tissues, the vaginal route, in some cases with the addition of the paravaginal incision, is, in Dr. Boldt's opinion, the preferable procedure. The operation can be done more quickly and with less shock than by the abdominal route. His personal experience is that with the performance of the abdominal operation, with the disease well advanced, the ultimate result is not good either. In regard to the point raised by Dr. Cleaves and Dr. Massey, he said that he has yet to see the first case of cure by any other than surgical means when cancer has been positively diagnosed.

DR. S. STRAUSS, New York City, used trypsin in three cases, but with no permanent favorable results. He got the reaction mentioned by Dr. Cleaves in one case, but in the other two got no reaction at all. He thought that it would be unwise to accept the trypsin treatment as justifiable. He has experimented with the trypsin method and has one apparently cured case in which he gave injections of serum taken from a mare suffering from carcinoma. The case was one of cancer of the pylorus, operated on by Dr. R. Abbe. There was an extensive recurrence. The patient was emaciated, weighing only ninety pounds, and suffering intense pain, which necessitated the use of 10 grains of morphia daily. The serum was injected on alternate days, the patient improving constantly until no more morphin was necessary. After one and a half years he weighs 200 pounds and apparently is in the best of health. Dr. Strauss has other cases that are doing as well with the serum as with the trypsin treatment. The serum enables him to discontinue the use of morphin. The action of the serum is the same as that obtained in the opsonic treatment described for other diseases. It raises the toxin destroying powers of the leucocytes. As carcinoma is extremely rare in the lower animals, it has been impossible to obtain a sufficient amount of serum to enable him to use it in every case that has come under his observation. In regard to the treatment of cancer of the uterus, one ought to remember that carcinoma pronates itself through the lymphatics and that when operating we should handle the tissues gently. If one could seal up the lymph vessels with the actual cautery at the time of operation much would be done toward limiting the spread of the disease and preventing recurrences.

DR. DANIEL H. CRAIG, Boston, referred to a report he made four years ago in which he detailed the results of an investigation of the cases of carcinoma treated at the Free Hospital for Women in Boston. His paper dealt with the question of repairing cervical lacerations. Incident to that came up the question of the influence of this condition on the production of cancer. In tracing all the cases on record, which could be traced, no case was found in which the cervix having been properly repaired and not being subsequently reinjured had developed carcinoma. In many of the cases twenty years have elapsed since the operation. Dr. Craig thinks that practically all forms of uterine cancer are the result of some form of cellular irritation. Therefore, a great deal can be done in the avoidance of future carcinomatous conditions if the medical profession can be made to realize that any form of cellular irritation about the uterus should be removed.

DR. J. H. CARSTENS, Detroit, said that as long as the cause of cancer is unknown, it is difficult to prevent and lessen the mortality of cancer. It is known that cases with irritation have a tendency to develop into cancer; but, if physicians will bear in mind that cancer always, at some time, is a local disease; that at some time in its course the tumor is as big as a pin head; that at some time it is as big as a pea, and that it will become as big as a walnut or an orange, and if on discovering this local disease, do the radical operation, much will be done to lessen the mortality. In curetting, or in operating for lacerated cervix, the tissues removed should be examined carefully and many times the cancer will be found to be in the very early stage.

DR. E. E. MONTGOMERY, Philadelphia, was in accord with the majority of the speakers. He said that it is possible that some

of the methods of procedure that are being advocated may afford the clue or open the avenue through which this disease may be combated; but, until that time comes, he urged that in every case in which the physical examination engenders the hope that the disease is still local, a radical operation should be done, and that the knife should be the means by which the disease should be combated. Other methods of procedure may be employed in those cases in which it is evident that the knife can not be used. They are in accord with a legitimate line of investigation, and may afford the means with which to combat the disease successfully, but until that is demonstrated the means shown to be most effective should be used.

PREVENTION OF PERITONEAL ADHESIONS BY ADRENAL SALT SOLUTION,

WITH ESPECIAL REFERENCE TO THE PELVIS.*

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Peritoneal adhesions result from a pathologic process active within or adjacent to the peritoneum. Their formation is Nature's effort to combat an injurious process, and is effectual in establishing a limiting wall and often in making inactive the irritating agent. In fulfilling these purposes, peritoneal adhesions are agents for good and a protection to the organism. If these adhesions encroach on, constrict or in various other ways impair the function of the adjacent organs, however, as most frequently they do, they then become a menace to the parts and jeopardize the comfort and vitality of the individual in whom they may occur. When such condition exists it commands the effort of the surgeon to give relief. The prophylactic remedy lies in preventing their formation, and this is perhaps best accomplished by removing the irritant before such mischief can be done. This may be illustrated by the removal of the appendix previous to extensive pus formation, or in gall-bladder drainage for cholecystitis before its rupture or extension of the septic material has taken place. The remedy, when adhesions are already formed, is to separate the adherent parts and prevent their subsequent reuniting.

The peritoneum is a serous membrane. Its surface is covered with a very thin layer of endothelial cells that are loosely approximated. Just beneath the surface of these delicate cells lie the blood and lymph channels. Osmosis of serum and lymph is active between these channels and the peritoneal cavity. This takes place through the interstices that interpose the endothelial cells. Exosmosis is increased by any condition which increases the blood supply to the parts, thereby distending the walls and increasing the caliber of the interstices.

By these structural provisions the peritoneum is highly exudative and absorptive.

When an irritant is active at the peritoneal surface there is an overfilling of the blood vessels, with subsequent exudation of serum and transmigration of leucocytes. This exudative product is cohesive and by its nature fastens together any and all adjacent surfaces. If the irritant becomes inactive, by limitation or otherwise, the exuded material organizes and forms fibrous tissue. This tissue has a tendency to further contract, thereby limiting motion and constricting the size of the attached organ. The evils therefrom are many and evi-

dent. In order to correct this condition it becomes necessary to get rid of the irritant, release the parts, remove the fresh exudate, prevent further exudation and to keep the approximal surfaces apart until at least partial repair has taken place.

REMOVE THE IRRITANT. RELEASE THE PARTS.

The conditions within the pelvis which command action for the relief and prevention of peritoneal adhesions are those resulting usually from inflammation of the tubes, ovaries and the appendix. Tubal and ovarian diseases usually have brought about extensive adhesions before their removal takes place. These adhesions are extended to the sigmoid, uterus, small intestines, omentum and parietal peritoneum. These inflammatory conditions are mostly pyogenic in origin, induced primarily by the invasion of one or more kinds of infective micro-organisms and the pus and the bacteria are usually pent up in a circumscribed mass. When the pus has been imprisoned for some time, the bacteria lose their virulence in the majority of cases, and often become inert. It is to collections of pus of this kind that the term "sterile pus" has been given. Whatever may be the condition, it is the duty of the surgeon to eliminate it, to get rid of the irritant. This is accomplished by enucleation and removal of the mass. There is another condition of local or general adhesions in which the irritant has been previously removed. When adhesions are the only evidence left of previous inflammation, these hold fast, incapacitating the adherent organs and causing distressing pain and other discomforts that invite correction. It becomes necessary to release the constricting adhesions: to separate the adherent surfaces. Too well does the surgeon know how strongly inclined these surfaces, oozing and bleeding after being torn apart, tend to immediately reunite when permitted to fall together. It is this class of adhesions which has exhausted the patience of the surgeon—and of some patients also—in repeated attempts to relieve by separation and replacing the viscera which reform, producing the same trouble again and again. Solution and removal of the exudate, prevention of further exudation, and keeping apart the surfaces should be the effort.

DISSOLVE THE EXUDATE.

The exudate consists of blood and lymph elements: blood serum leucocytes, and lymph when the exudate reaches the surface without a separation of the continuity of the structure; free blood with its coagulating ferments when there is a laceration of the parts and open vessels are leaking. When the exudate consists of serum, lymph and leucocytes alone, it is liquid of greater or less density. If it be free blood, coagulation takes place early and clotting is consequent. Fluids are absorbed with ease; solids of large masses with difficulty. Fluids of low density are taken up more readily than fluids of high density. The factors which prevent coagulation or destroy coagulating ferments prevent peritoneal adhesions. In order better to facilitate the resorption of the peritoneal exudate, it is desirable to dissolve the mass into a fluid of low density. Saline solution is a most excellent agent for this purpose. It aids in the dissolution of the coagulum and dilutes the serum as well as maintains the solution and dilution during the time of absorption. The efficiency of saline solution in performing the function of dissolving, diluting and maintaining the blood elements in solution is demonstrated constantly by the method in practice for the examination of blood where blood counts are made.

* Read in the Section on Obstetrics and Diseases of Women of the American Medical Association, at the Fifty-eighth Annual Session, June, 1907.