referred to, pressing it down on each side of the nerve, fitting it evenly so that the nerve could come in contact with the tissues of the hand only at its posterior surface as it passed along its course. The flaps, composed of the skin and subcutaneous tissue—which I had formed in exposing the field of operation—were united over the gold foil with silkworm gut and horsehair. The greatest care was taken at every step of the operation to secure the most perfect asepsis and coaptation of all the parts. The wound was covered with copious dressings which were removed at the end of ten days, when the wound was found perfectly dry and the stitches removed.

This last operation was made April 18, 1899, and about two months later the patient resumed work as a bridge carpenter, and has continued in this employment since, having been practically free from pain.

When he first resumed work, if he exercised the muscles of his arm much or exposed it to any continued jarring influence, or if he became exhausted from any cause, he would suffer more or less severe attacks of pain, which would however subside after a day of rest. The condition of the nerve gradually improved until at the end of a year he was practically free from pain, whatever he might do. At that time an incident occurred which illustrated the serious nutritive disturbance resulting from two and one-half years of constant irritation. He was employed to pick up nails for three hours, and that night suffered considerable pain, contraction of fingers into the palm of the hand and vasomotor paralysis. This all cleared up without treatment, after a day or two of rest. It may be observed in this connection that the hand was very susceptible to the influence of cold.

At the present time—one and one-half years after the operation—the median nerve may be said to have been restored to its normal state of nutritive stability, and that the man is able to perform any labor adapted to his years and strength with entire freedom from pain.

AN OPERATION FOR CYSTOCELE.

GEORGE H. NOBLE, M.D.

ATLANTA, GA.

The necessity of operating for cystocele, either with or without plastic operations, of the female genital tract, is not an infrequent occurrence. The unsatisfactory results of operations usually employed, especially in old women with relaxed and dilated vaginal outlets, are frequent. Usually failure is due to stretching of the newly formed cicatrix, or to imperfect attachment when the base of the bladder is anchored to structures above the plane of the anterior vaginal wall.

In the absence of dense fascia in this part of the genital canal the repair of cystocele must depend upon the fixation of soft yielding structures to similar parts, but should be reinforced by ample support from the posterior vaginal wall and perineum, and in certain cases with ventrosuspension or some similar operation. Even then the results are not invariably good. This, with the fact that extensive operations in old women are objectionable, makes an urgent appeal for improvement in technique.

Hoping to find something to answer the demand, various procedures were tried as cases of this kind presented themselves to me. First, superimposed layers of catgut sutures were used in the sulci on either side of the vagina with fair success, and perhaps superior to the ordinary Stoltz-Sims operation or elliptical denuda-

tion. Following this the redundancy of tissue was folded in upon itself and pressed into the bladder-space by superimposed layers of catgut sutures in the median line (see Case 1). The effect was quite good, but occasionally there would be some return of the cystocele in after years. Other modifications were tried with varying success until buried sutures of silk, silver and kangaroo were used.

With patient in Sims' position, a diamond-shaped denudation is made over the protruding cystocele, which should be outlined in the following manner: With two pairs of tenacula the mucosa is picked up on either side of the vagina, about half-way up the canal, and drawn toward the median line. This is repeated until two points are selected that will barely meet or touch when slight tension is put on them. They are marked by snipping out the pieces of mucous membrane engaged by the hook. In like manner the angle at the base of the urethra, and also one anterior to the cervix uteri, are marked. A tenaculum should engage the point on the right-hand side and sufficient tension be made upward to throw the mucous membrane of the vagina into a sharp fold or ridge running from the urethra to the tenaculum. With a pair of scissors a strip of mucous membrane is pared off along the crest of the ridge marking the right inferior side of the quadrangle. The hook should then be fixed at the mark anterior to the cervix and a thumb forceps should catch the lateral angle just released from the tenaculum. The two instruments are then drawn in opposite directions, forming a fold in the vaginal wall similar to that described above. A strip of mucous membrane is removed between the instruments marking the right superior side of the quadrangle. In like manner outlining of the diamond is completed upon the opposite side, after which it becomes an easy matter to remove the island of mucous membrane in one piece. All fatty tissue should be removed as far as practicable, that it may not interfere with direct contact of the muscular tissue. The sutures are easiest introduced by starting on one side of the urethral angle. The needle should enter the edge of the denuded surface beneath the mucous membrane, penetrating at the junction of the middle and lower third of the right anterior side of the quadrangle, passing in an eccentric direction to a depth of one-half inch into the vesico-vaginal septum. On returning it should emerge from the margin of the wound one-half inch away, completely burying the suture. It is then carried a short distance toward the center of the field, perhaps one-half inch, and a deep stitch taken in the vaginal wall but not including the mucosa of the bladder. The suture is then returned to the margin of the wound and another buried stitch made as first described, but penetrating the septum one-fourth to one-half inch further. Another stitch is then made in the denuded surface, after which a third one is introduced upon the outer side of the wound as first described (see Fig. 1). In this way five stitches are introduced on each side of the diamond (see Fig. 1), three of which are submucous and extended horizontally outward, including the muscularis of the vagina and bladder; the other two are made in the denuded field and passed at right angles to the surface. It will be observed that a line drawn from the tips of each of the loops extending outward will approximate a circle, and the suture when drawn tight will assume a similar shape, effectually closing the wound on the principle of a purse-string. The sides of the diamond are forced sharply inward and each converted into a right-angled triangle,

the apices of which come in close contact in the center of the wound, forming an imperfect cross (Fig. 2). The margins of the wound are accurately closed with catgut (see Cases 4 and 5).

When silk or kangaroo sutures are used they should be introduced in a slightly modified manner (Fig. 3). Let the diamond *a*, *b*, *c*, and *d* represent the denuded surface over the vesicocele. Four small silk sutures are passed across the angles at the points 3-3-3-3, or at a distance from the angles equal to one-fourth of the respective sides of the quadrangle. They should be small silk or medium kangaroo, and include all the tissues of the vesico-vaginal septum except the mucous membrane on either side, and should be buried deep. They serve to close the angles of the wound and reduce the field of operation to such an extent that a smaller purse-string suture can be used. This is quite an important feature for unabsorbable sutures. When they

of silver wire, *but any lasting buried suture may be used*. Any one familiar with the technique of burying fine silver wire (No. 28) will meet with success when employing it in this operation. It should be buried deep, fastened with very little tension, and the ends folded under twice and mashed down flat to prevent its sticking or irritation (Figs. 5 and 6). When wire is used it is perhaps better to begin its introduction at one of the lateral triangles, that the twisted ends may be covered more deeply and placed out of harm's reach. Silk suture, large kangaroo, chromicized catgut are satisfactory materials, but personally I prefer the silver *for very bad cases*, because I have had no unpleasant result with it in the operation.

ILLUSTRATIVE CASES.

CASE 1.—M. C., Atlanta, Ga., aged 35 years, was admitted to the King's Daughters Hospital, April 30, 1890. The physical examination showed anemia and neurasthenia. The heart, lungs, and kidneys were negative. The perineum had been lacerated to the sphincter in her last confinement, four years

FIGURE 1.

exceed No. 28 silver wire in size the latter gives the least resistance, consequently the shorter the ligature the better are the chances of success, especially when silk is used.

This suture should be introduced in the manner described in Fig. 1, except that one stitch or loop only is made on each side of the diamond.

It should follow the line 2-2-2-2, each stitch surrounding the central point (Fig. 3, 1) of each side of the quadrangle. In passing across the denuded surface, from side to side, two deep stitches should be taken in the base of the bladder down to but not including its mucosa, at the points marked X. When drawn together and tied the sides of the diamond are forced in concentrically (Fig. 4, 1), producing the same effect as the wire—that is, the formation of a cross. The margins of the wound should then be closed with a whip-stitch of fine catgut (see Cases 2 and 3).

Success of the operation does not depend on the use

FIGURE 2.

before. The uterus was subinvolved, retroverted and about three times its normal size. The bladder was rolling out between the vulva in a mass the size of a large goose-egg. There was frequent dysuria, the urine alkaline, otherwise negative.

An oval denudation was made over the cystocele to its base on all sides and superimposed layers of catgut sutures—whip-stitch—were put in from above downward, tucking the redundancy of tissue into the bladder space as each layer was imposed. In all, three layers were employed, two being completely buried, the last used as a finishing suture to close the margins of the wound, after which colpoperineorrhaphy after Martin was done with slight modification. The immediate results were satisfactory and the patient was dismissed May 24, 1890.

Seven years afterward I had an opportunity of examining this case, and, much to my gratification, she had remained well with the exception of slight retroversion. Other cases were done in this way prior to the year 1888, but my notes of them are missing, consequently this one is employed for illustration.

CASE 2.—Mrs. M. E. D., aged 33 years, was admitted to the King's Daughters Hospital, Sept. 11, 1888. She was a hard-working woman, having the care and support of an invalid husband, two children and herself forced upon her. The perineum had been lacerated to the rectum in the first confinement, five years before. The uterus was completely prolapsed and protruding from the vulva. The bladder extruded in a globular mass about the size of a baseball. The anterior vaginal wall was very short, the posterior very long, making the fitting of a pessary impracticable. Frequent attacks of cystitis added much to her discomfort and the prolapsus grew rapidly worse until she was forced to go to bed.

The heart, lungs and kidneys were normal, also the urine, except that it was alkaline in reaction and contained a quantity of pus and albumin. Anemia was marked.

The cystocele was reduced in the manner described in the

day—twelve years after—is a well, hard-working stenographer and typewriter.

CASE 3.—With this case I had the honor of beginning the surgical work of the Grady Hospital—the first case, the first day, the first operation. Chromicized catgut was used, closing the diamond on the principle of the purse-string as described above. There was great relaxation of the vaginal outlet, requiring closure by the Emmett operation on the perineum.

The cystocele was very large, dragging the uterus so low that the cervix protruded between the labia with the rectum rolling out behind it. The patient was incapacitated for work of any kind, being confined to bed the greater portion of the time, and, not being able to retain any form of artificial support, suffered frequent and distressing dysuria and fermenting and alkaline urine.

FIGURE 3.

operation where silk sutures were used (Fig. 3), this being the first case in which I employed it. I first began making the diamond denudation in preference to the oval, on account of the greater facility with which it could be done; then found

FIGURE 4.

that it afforded a better and easier approximation of the edges of the wound. This was strikingly apparent after putting in the small stitches across the angles. The purse-string suture naturally presented itself, and was employed to bring the sides of the diamond into the center of the field. An important step in each of these stitches is taking an extra deep hold in the muscular coat of the bladder as well as in the vagina. This is an immense advantage over the old Stoltz operation, which only puckers the mucous membrane together.

The posterior operation was done upon this case, employing Emmett's operation on the perineum and buried catgut—superimposed—in the posterior vaginal wall. The results were excellent. The patient was dismissed Oct. 13, 1888, and to-

FIGURE 5.

The operation proved satisfactory for five years; after that time she was lost sight of. A result of this kind in a woman 60 years of age, who was placed in charge of the children of an orphan asylum, with the exertions her duties required, speaks well for the method of operating.

CASE 4.—Mrs. G., Decatur, Ga., aged 65 years, presented a bladder protruding through the vaginal orifice the size of a goose-egg, with painful and frequent urination from fermenting urine. Confined to bed for the greater part of three weeks, she

FIGURE 6.

was anemic with relaxed vaginal outlet; no tear in the perineum. The uterus was senile, but engorged, enlarged and dragged down nearly to the floor of the pelvis.

Operation was done with the assistance of Drs. Green and Thomas, and silver wire, No. 26, used. Approximation was nearly circular, the denudation being oval in shape. The center was imperfectly closed, leaving a slight aperture in the center where the tissues crowded together. Here the advantages of the diamond-shaped denudation were shown, as the sharp angles formed by the four sides of the quadrangle fitted accurately into each other so as to prevent gaping of the wound. Success was all that could be expected. The cystocele was relieved. The dragging uterus was relieved of its strain and

weight, consequently it resumed its normal position. The cystocele was not of very long standing.

CASE 5.—Mrs. C. O., aged 54 years, was admitted to Grady Hospital July 16, 1898. Urine: Color normal, specific gravity 1028, acid, small amount of albumin, much oxalate calcium crystals; no casts. The perineum was torn to the sphincter ani, a vesicocele, like a large pear, protruding from the vagina.

I operated on July 28, with diamond shaped denudation; wire purse-string suture, buried; superficial suture, catgut. A flap operation was done on the perineum, with wire and catgut. The stitches were removed Aug. 5. The results were perfect.

This case is selected as an illustration because the operation was done in the presence of Major McDonald, Surgeon U. S. V., of Albany, N. Y. The diamond was drawn together with buried silver wire, No. 28, and the margins of the wound whipped over with small catgut. The results were excellent and the wire was successfully buried. At last accounts the patient remained well and free from polyuria or prolapse of the bladder. The dysuria was completely relieved.

131-133 S. Pryor Street.

INDIVIDUAL PROPHYLAXIS.

W. A. EVANS, M.D.

CHICAGO.

The question of individual prophylaxis includes preventive measures against bacterial and all other diseases and morbid conditions other than inherited structural changes and pathologic processes. What I will say will be limited to a few features of bacterial diseases.

In bacterial diseases we must never lose sight of two groups of factors: 1, the invader and its modifiers, and 2, the defendant and his modifiers. In the case of epidemic diseases the first of these is of supreme importance. However, even here the second is a factor, for even in times of severe epidemic not all of those who inhale or otherwise take in the bacterial cause have the disease, even though they have not the immunity acquired by a previous attack or by intermittent association.

In the case of endemic diseases, the second factor, namely, the individual and his modifiers, becomes of major importance. However, the first factor is not to be lost sight of, for, with influenza bacilli present in mucous secretions that are normal, and there being no such thing as acquired influenza immunity, in the ordinary acceptance of the term, it follows that there must be variance in the chemistry of the influenza bacillus.

Levy and Klemperer say: "From the constant contact with the infective bacteria to which man is continually exposed, infections would be far more frequent than they really are if the predisposition of human beings to bacterial disease were not on the whole but inconsiderable. In general, the power of resistance of our tissues against bacteria is so great that for infection to take place an additional special contributing cause that diminishes this power of resistance, in other words, a predisposing influence is necessary."

When we study the individual as a factor in infectious diseases we find many subsidiary factors. There is inherited immunity acquired by an attack of the disease, by an attack of a similar disease, by intermittent exposure, etc. In addition to these influences retarding infection, there are factors aiding it. I will restrict what I have to say to four of these: 1. Mental depression. 2. Overexertion. 3. Cleanliness. 4. Exposure to cold.

Mental Depression.—We have illustrations in the experience of every one that temporary susceptibility can come from mental depression. Every text-book article on susceptibility and immunity gives mental depression as a predisposing cause. This is a very considerable factor in infection in its inception; it can also be a factor in its continuation. The patient with an infectious disease, who is frightened or otherwise depressed, has a lessened chance of successfully resisting.

Overexertion.—The effects of overexertion are matters of constant laboratory observation. The dog treadmill and the rat-cage with a revolving attachment are matters of almost habitual class demonstration. The only point that I wish to raise here is: Is it not possible that at times our physical treatments are too vigorous? For example, some surgical dressings, especially those of fractures; the prolonged maintenance of one position in bed, whether that position is difficult or the easiest possible; the prolonged maintenance of head-low-position after hemorrhage; vigorous tubbing, etc.

Cleanliness.—A few years ago one of the most brilliant younger members of Chicago's medical profession quit that for the soap business. In a recent private letter he claims continued kinship with the medical profession because the soap profession is the cleanest of professions.

Two sides of the dirt question require no word: The first is, dirt as one of the elements of bad hygiene; the second, dirt as a carrier of infection in wounds. There is an unorthodox side about which I wish to say a word. Suppurative conditions and suppuration-bacteria are endemic. In ever-present diseases the personal equation of the individual attacked is the larger factor. Is not cleanliness increasing our susceptibility to pus processes, both as prime causes of localized abscesses, metritis, appendicitis, and diffused disease conditions—septicemias and pyemias—and as complications of other diseases, such as tuberculosis and typhoid. Fowls do not have suppurations. It is difficult to infect guinea-pigs, rabbits, and, in fact, any of the lower animals with pus cocci. Wounds of the feet of horses and other domestic animals do not ordinarily suppurate. Tuberculosis in such animals frequently makes fibrous, often caseating lesions. Sometimes liquefying areas are found. Suppuration is altogether exceptional.

It is a matter of common observation that wounds on the hands of farmers and machinists, where cleanliness is not possible, seldom suppurate. Wounds on the hands of people whose work does not soil the hands are very prone not only to local infection, but they frequently serve as portals for more or less general lymphatic or blood infection. Susceptibility and immunity of a given area entirely regardless of general susceptibility and immunity have been demonstrated in the case of the rabbit's ear.

I have seen postpartum infection of negro women of the less cleanly type yield speedily to the most rudimentary cleanings. Infections in white women, seemingly much less violent and combatted by cleanings that were much more thorough, have been inefficient.

Exposure to Cold.—It would consume space unnecessarily to cite proof that exposure to cold, to heat, to wet, etc., can determine infection in both man and the lower animals. It is quite possible that the mechanism lies in the vasomotor apparatus alone. Again, it is possible that it pertains to the vasomotor apparatus and the local cells combined. The only point I wish to make here is: To protest against the policy of protection; to be specific, woolen underwear, rubber shoes, chest protectors, throat mufflers, hot Scotch, etc.